WJEC GCSE MATHEMATICS (UNITISED)

MATHS



EXAM QUESTION PACK

UNIT 1 FOUNDATION TIER 4351 PAPERS

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4351/01

S16-4351-01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: Mathematics in Everyday Life

FOUNDATION TIER

A.M. THURSDAY, 26 May 2016

1 hour 15 minutes

ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **4**.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**6**	
2.	**7**	
3.	**5**	
4.	**7**	
5.	**4**	
6.	**3**	
7.	**4**	
8.	**9**	
9.	**5**	
10.	**3**	
11.	**4**	
12.	**2**	
13.	**3**	
14.	**3**	
Total	**65**	

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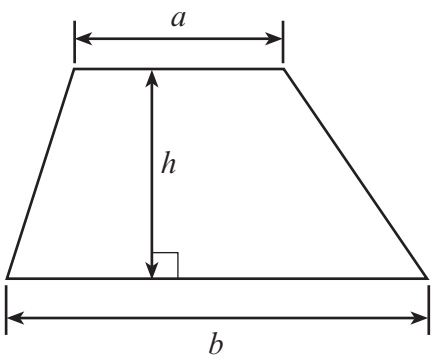
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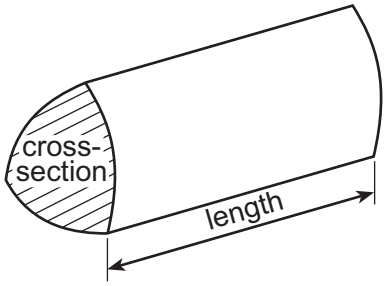
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Formula List

Area of trapezium $= \frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



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1. A builder uses the following formula when preparing a bill for his customers.

Total cost = £15 × number of hours worked + cost of materials

(a) Calculate the total cost when he worked for $7\frac{1}{2}$ hours and the cost of materials used was £107.50. [2]

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(b) The customer paid 25% of the total cost using cash.
The customer paid the rest of the total cost by credit card.

(i) How much money did the customer pay using cash? [2]

.....

.....

(ii) What **fraction** of the total cost did the customer pay using cash? [1]

.....

(c) The builder started work on the $7\frac{1}{2}$ hour job at 08:00.

He had 1 hour off for lunch.
At what time did he finish this job? [1]

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2. A community cafe was set up to support a local charity.
Over the summer, 40 volunteers helped out at the cafe.
The number of days for which each volunteer helped out is shown below.

28	15	1	42	3	10	8	30	1	32
35	52	9	1	19	35	12	5	25	30
13	5	32	10	3	50	20	3	12	11
3	30	4	20	1	22	15	10	5	18

(a) A table is drawn to show this information.
Complete this table. [3]

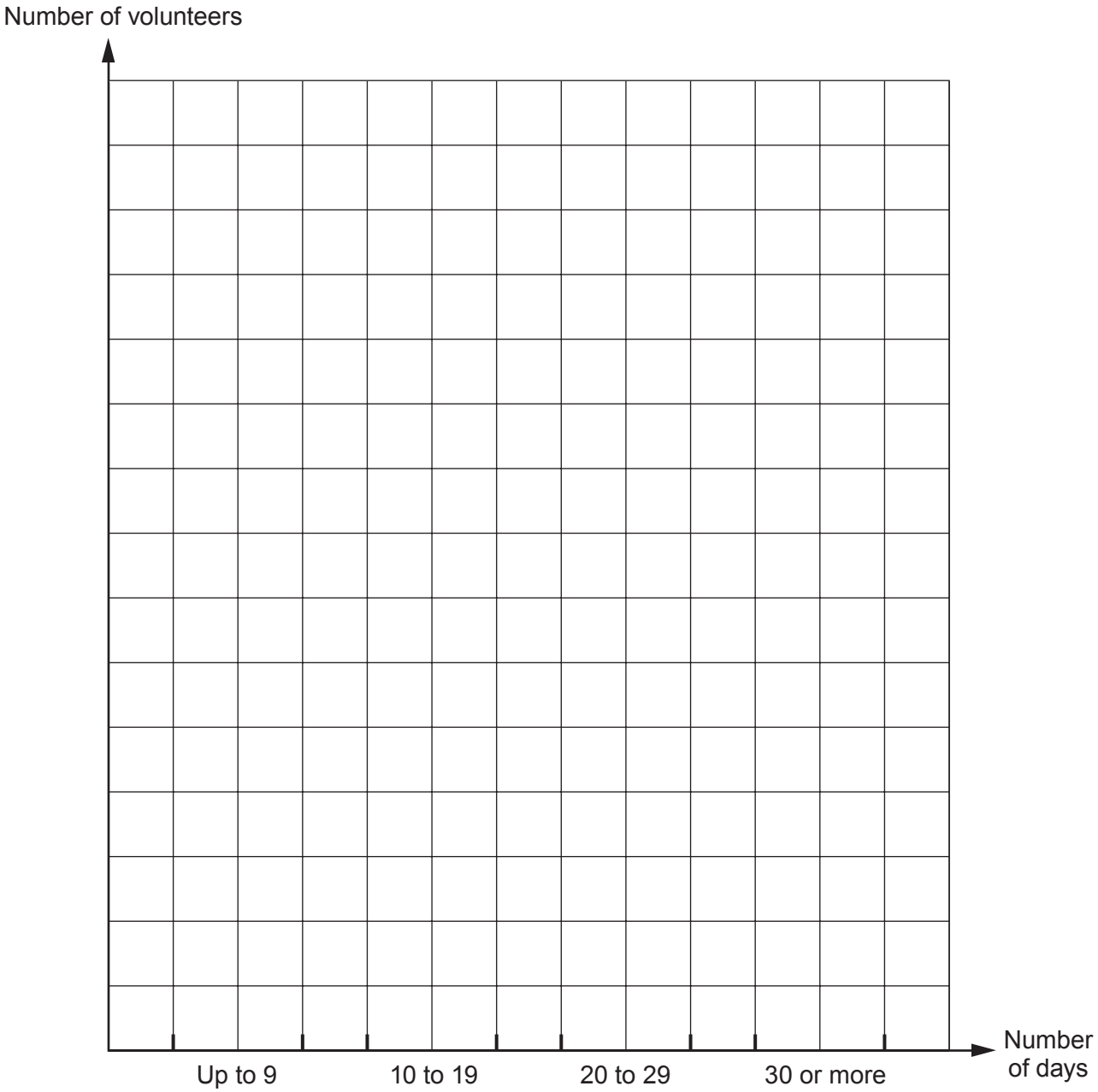
Number of days	Tally	Number of volunteers
Up to 9	𝍸 𝍸 ////	14
10 to 19		
20 to 29		
30 or more		

(b) Using the squared paper on the next page, draw a suitable bar chart that shows this information. [3]

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(c) Explain why it is not possible to find the range of the number of days volunteered by looking at the bar chart alone. [1]

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3. Susan checks her water-meter reading every Monday morning.
Five readings taken during August 2015 are shown below.

Date	3rd August	10th August	17th August	24th August	31st August
Meter reading (m^3)	76·5	80·7	84·6	94·8	98·9

(a) How much water was used between the 3rd of August and the 31st of August? [1]

.....

Water used = ...m^3

(b) How many weeks are there between the 3rd of August and the 31st of August? [1]

.....weeks

(c) Calculate the mean amount of water that was used per week over this period of time. [2]

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(d) On one day during this month, Susan left a garden sprinkler on all day which used 4·5 m^3 of water.
Write down a possible date on which this could have happened. [1]

Date .....

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4. *You will be assessed on the quality of your written communication in this question.*

A shop sells oranges in packs of 8 at a price of £1.44.
A special offer is advertised as two packs for £2.40.

Emyr bought two packs using the special offer.

Emyr had to throw away $\frac{1}{4}$ of the oranges he bought because they became mouldy before he had time to eat them.

Calculate the price per orange
(i) when buying a single pack,
(ii) when buying two packs at the special offer,
(iii) for the oranges that Emyr actually used.

Comment on whether Emyr was wise to use the special offer.
You must show all your working. [7]

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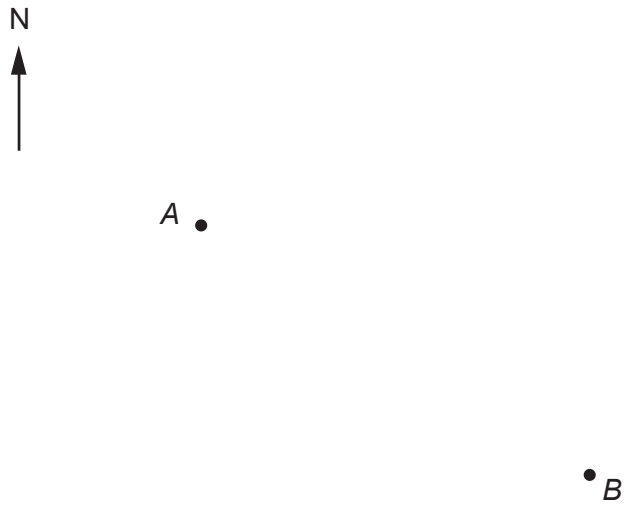
5. Three points *A*, *B* and *C* are to be shown on a plan whose scale is

1 centimetre represents 20 metres.

Point *A* and point *B* are already shown on the plan below.
Point *C* is further North than point *B*.

Angle *ABC* is 75° and the actual distance *BC* is 180 metres.

(a) Show where point *C* should be on the plan. [2]



(b) What is the actual distance between point *A* and point *C*? [2]

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Actual distance between point *A* and point *C* = ...

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6. Complete the table below which shows the change in the midday temperatures on two successive days at four locations.
The first row has been done for you. [3]

Location	Temperature at midday on the first day (°C)	Change (°C)	Temperature at midday on the following day (°C)
Holyhead	−2	Up 3	1
Paris	4		−1
Helsinki	−5	Down 2	
Glasgow		Up 1	0

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7. Given that

- 1 litre is approximately 1·75 pints,
- 1 gallon = 8 pints,

calculate the approximate number of gallons that are equal to 16 000 cm^3. [4]

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16 000 cm^3 = ... gallons

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8. Builders use cement and sand to make mortar when building walls.
They estimate how much material they need to order before they start to work.

One useful estimation they use is shown below.

For every 1 m² of wall:	cement required = 15·5 kg, sand required = 56 kg.

Hasan is building a wall 25 metres long and 2 metres high.
He buys cement in 25 kg bags costing £4.87 per bag.
He buys sand in 40 kg bags costing £2.65 per bag.

Calculate the total cost of the cement and sand required.
You must show all your working. [9]

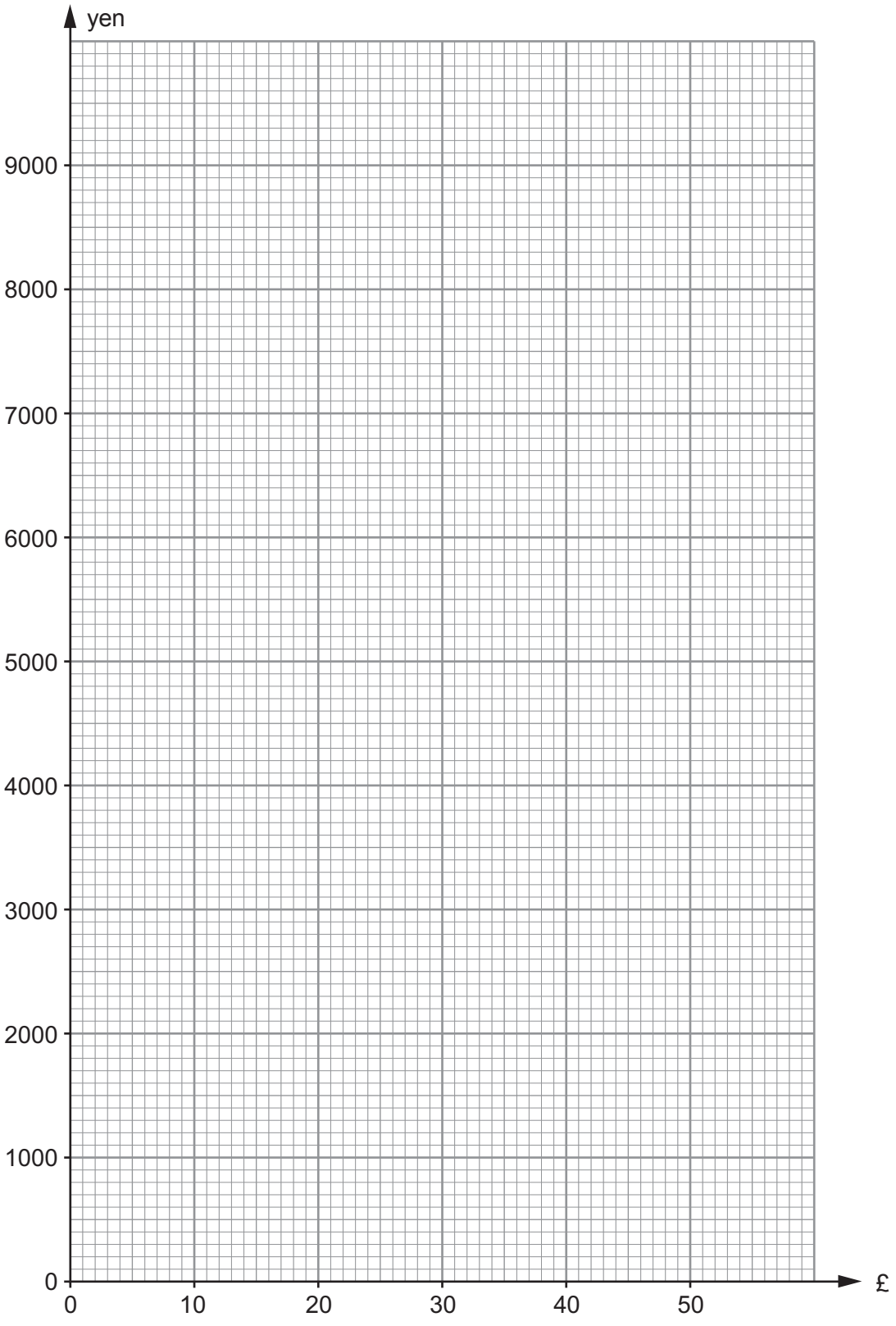
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9. Dylan is going on a trip to Japan.
The exchange rate at the time of his trip is £1 ≡ 175 yen.

(a) Draw a conversion graph between £ and yen on the graph paper below.
The graph should show the conversion from £0 to £50. [3]



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(b) Use your graph, or otherwise, to convert 20 000 yen into pounds. Give your answer correct to the nearest pound. [2]

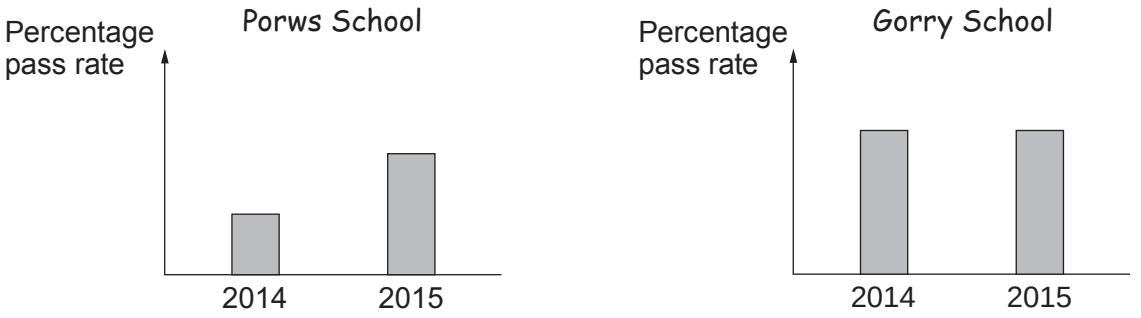
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10. *(a)* Explain why the following statement and diagrams may give a misleading impression. Include an example to show how this could happen. [2]

'Porws School celebrates, as percentage pass rate doubles, but no increase at Gorry School.'

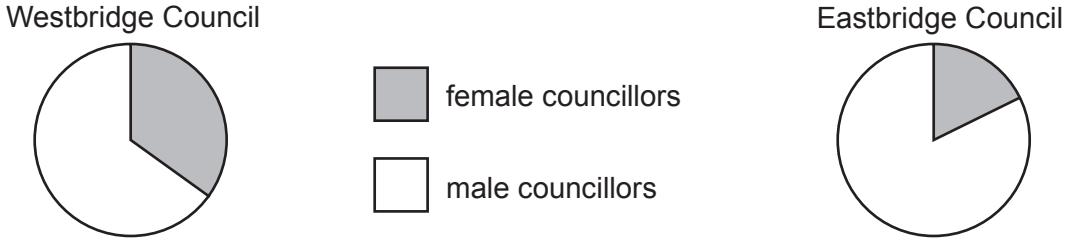


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(b) Explain why the statement beneath the following pie charts may not be true. [1]



'There are more female councillors on Westbridge council than on Eastbridge Council.'

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11. Orienteering is a competition that involves running and using a compass to find directions. It is usually held in wooded and hilly areas of the country.
Liam and Krysta are competing in an orienteering event.

Liam starts from point *A* and Krysta starts from point *B*.
They are only given the finish point *P* of the race once they are at their starting positions.
Liam is told that point *P* is on a bearing of 108° from point *A*.
Krysta is told that point *P* is on a bearing of 230° from point *B*.

(a) By drawing suitable lines, mark the position of point *P* on the diagram below. [3]



(b) When training together, Liam and Krysta have the same running speed.
Neither of them stopped during the race. Both went as fast as they could and there were no injuries.
Both started at the same time.

Give a possible reason why the person who started furthest away from point *P* got there first. [1]

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12. Calculate $\frac{854 \cdot 7}{(43 \cdot 2 - 37 \cdot 6)^3}$, giving your answer correct to 3 significant figures. [2]

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13. A baker requires 825 kg of flour.
She buys the flour in bags that contain 36 kg of flour, correct to the nearest kg.

Is she guaranteed to have enough flour if she buys 23 of these bags?
You must show the calculations needed to decide your answer. [3]

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14. In a game, it is possible for **each** player to score between 1 and 10 points.
Lois and Beca play the game five times.

The table below shows the points scored by Lois in each game.

	Game 1	Game 2	Game 3	Game 4	Game 5
Lois	5	2	8	5	1
Beca					

Beca had a higher mean score than Lois.
Beca had a lower median score than Lois.
Beca had a lower range of scores than Lois.

Complete the table above with a set of possible scores gained by Beca. [3]

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Question number	Additional page, if required. Write the question number(s) in the left-hand margin.

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GCSE MARKING SCHEME

SUMMER 2016

GCSE MATHEMATICS UNITISED UNIT 1
FOUNDATION TIER
4351/01

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INTRODUCTION

This marking scheme was used by WJEC for the 2016 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

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GCSE Mathematics - Unitised Unit 1 Foundation Tier
Summer 2016 Mark Scheme

Summer 2016 Unitised Unit 1 Foundation Tier	✓	Mark	Comments
Ribbon marking for 1(a) and 1(b)(i) 1.(a) (£)15 × 7·5 + (£)107.5(0) = (£)220		M1 A1	M0 for (£)15 × 7·3 + (£)107.5(0)
Ribbon marking for 1(a) and 1(b)(i) 1(b)(i) 0·25 × (£)220 = (£)55		M1 A1	FT 'their £220'. Mark final answer. SC1 for (£)165 (or equivalent FT credit payment.)
1(b)(ii) ¼ or equivalent **fraction** (not decimal)		B1	CAO (no FT). Mark final answer.
1(c) 16:30 or 4:30(p.m.)		B1	Allow unambiguous notation. B0 for 04:30. B0 for 4:30a.m.
Ribbon marking for 2(a) and 2(b) 2(a) Attempt at tallying (14) 11 5 10		B1 B2	These need not be correct number of tallies. B1 for 1 or 2 correct.
Ribbon marking for 2(a) and 2(b) 2(b) Uniform scale for the frequency axis starting at 0 Four bars at correct height.		B1 B2	Starting at 0 may be implied. B0 for ambiguous placement of scale numbers. B1 for three correct heights. FT 'their numbers' in (a). If no scale shown, assume intervals of 1 from 0 to 15 for the 2nd B2 (or B1). Allow FT, if possible, from a scale that was non-uniform (B0) but only because of one slip. Note : If uniform scale is 0, 5, 10 etc., then accept '12·5 < 14 bar < 15' and '10 < 11 bar < 12·5'. Penalise uneven bar widths −1 from the 2nd B2 (or B1).
2(c) Valid statement. e.g. 'We do not know the highest and lowest number of days.', 'It's grouped information', 'Days are bunched (not specific), 'It only gives 30 or more', 'You don't know the exact number of days', 'It isn't specific of the actual number of days'.		B1	Allow reference to not knowing either 'highest number' OR 'lowest number'. Also allow any reference to 'up to 9' OR '30 or more'. Do not accept 'It's only an estimate', 'It does not give the number of days' (that is, no mention of 'actual' or 'specific' number of days).
Ribbon marking for 3(a), 3(b) and 3(c) 3(a) 22·4 (m^3)		B1	
Ribbon marking for 3(a), 3(b) and 3(c) 3(b) 4 (weeks)		B1	
Ribbon marking for 3(a), 3(b) and 3(c) 3(c) 22·4 ÷ 4 = 5·6 (m^3)		M1 A1	FT 'their (a)' ÷ 'their (b)'. Allow rounding when FT answer not exact.
3(d) Any date between 17th (Aug.) and 23rd (Aug.) inclusive.		B1	Allow 24th (Aug.)

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Summer 2016 Unitised Unit 1 Foundation Tier	✓	Mark	Comments
4. (Number of oranges Emyr ate = ¾×16 =) 12 Use of 'Price ÷ N^{o} of oranges'. (Price per orange) (Single pack) £1.44/8 =) (£)0.18 or 18(p) (Two packs) £2.40/16 =) (£)0.15 or 15(p) (Oranges eaten) £2.40/12 =) (£)0.20 or 20(p) Statement that Emyr was not wise to use the special offer (as the price of the oranges eaten is more than the original cost) Look for • spelling • clarity of text explanations and correct units shown • the use of notation (watch for the use of '=' and '÷' being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	✓ ✓ ✓ ✓ ✓ ✓ ✓	B1 M1 A2 A1 QWC 2	*Candidates may earn these marks in the order they present their answer.* A1 for 1 or 2 correct. FT 'their 12'. Allow, <u>in this instance only</u>, 0·18p etc. but penalise in QWC award (unless corrected to 18p in further work). For a correct comparison of 18p with 240 ÷ 'their 12'. (8 < 'their 12' < 16). QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar. <u>An unsupported answer is QWC0.</u>
Ribbon marking for 5(a) and 5(b) 5(a) Angle ABC = 75° BC = 9cm		 B1 B1	**Use overlay and measuring tools.** Allow ± 2°. Allow ± 2mm
Ribbon marking for 5(a) and 5(b) 5(b) Length AC × 20 = 190 metres		 M1 A1	**Use overlay and measuring tools.** M1 for clear <u>intent</u> to use 'length of AC × 20'. ('Intent' taken to be a stated length × 20 OR for an unsupported answer equal to 'their AC' ±5mm × 20. FT 'their length ± 2mm' × 20. <u>Correct units must be given.</u>
6. (Paris) Down 5 (Helsinki) −7 (Glasgow) −1		B1 B1 B1	
7. 16000 ÷ 1000 × 1·75 ÷ 8 = 3·5(gallons)	 ✓ ✓ ✓ ✓	 M1 M1 M1 A1	Calculations <u>must</u> be linked to the 16000 at some stage before any M marks can be awarded. If a calculation using any of the three values is repeated (e.g. ÷8 followed by ×8, or ÷8 used twice) then M0. Ignore units throughout solution. Award the M1 at any stage. Allow FT if a previous M1 has not been awarded. C.A.O. but allow 3(gallons) or 4(gallons) if 3·5(gallons) is seen. Mark final answer.

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Summer 2016 Unitised Unit 1 Foundation Tier	✓	Mark	Comments
8. (Area of wall =) 25×2 $= 50(m^2)$	✓ ✓	M1 A1	
(Cement) $15{\cdot}5 \times 50$ OR (Sand) 56×50	✓	M1	FT 'their area' only if >25 and used consistently for cement and for sand.
$= 775$(kg) AND $= 2800$(kg)	✓	A1	Both required for A1.
(Cement bags) $\frac{775}{25}$ OR (Sand bags) $\frac{2800}{40}$	✓	M1	FT 'their derived amounts' (but not 15·5kg or 56kg).
$= 31$ AND $= 70$	✓	A1	Both required for A1. (Rounded up for FT answers.)
(Cost of cement) 31×(£)4.87 (Cost of sand) 70×(£)2.65	✓ ✓	M1	M1 for either. FT 'their derived number of bags' (even if not whole numbers).
= (£)150.97 AND (£)185.5(0)	✓	A1	Both required for A1.
(Total cost =) (£) 336.47		B1	FT if a derived cost found for both cement and sand (but not £4.87 or £2.65).
Ribbon marking for 9(a) and 9(b) 9(a) A correct point plotted at $(k,175k)$ $k \neq 0$		B1	*Allow (±£0.50, ±50yen) i.e. '½ a small square'.* B0 if any incorrect plots used e.g. 'dog-leg'. Allow unambiguous attempt at plotting an inappropriate point e.g. (1, 175) which may lead to B1,B1,B0.
A line joining (0,0) and their plotted point. Correct line drawn between (0, 0) and (50, 8750 ± 50).		B1 B1	If no line drawn award B1 for any 4 correct plots. CAO but award B1 if line starts at (10, 1750). This implies all previous marks.
Ribbon marking for 9(a) and 9(b) 9(b) Correct method using their graph e.g. 4 × reading at 5000 yen (£)114(to nearest £)		M1 A1	F.T. 'their graph'(allow ± ½ a small square). Must be to the nearest pound. E.g. using graph to give 5000yen = £29, so 20000yen = £116 is M1A1 *Alternative method* *20000 ÷ 175* *M1* *(£)114(to nearest £)* *A1* *(£)114.28……. or (£)114.29 gains M1A0* If graph not used then allow SC1 for £114 < Answer ≤ £115 (may be from trial and improvement).
10(a) Valid reason for misleading impression e.g. 'No scale (numbers / %) for pass rate.'		E1	Must refer to there being no information regarding scale for this E1'. Do not accept e.g. 'different number of pupils'.
Suitable example, e.g. '*Porws* may have gone from 10% to 20% but *Gorry* may (be better) at constant 80%'. '*Gorry'*s results are better'.		E1	Allow any form of suggestion that *Gorry School* (may) still have better results than *Porws School*.
10(b) A statement that refers to the actual numbers not being known. e.g. 'no figures given'.		E1	'There could be more councillors at Eastbridge' is E1. 'There could be more councillors at Westbridge' is E0.

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Summer 2016 Unitised Unit 1 Foundation Tier	✓	Mark	Comments
11(a) **Use overlay** Position at 108° from A. Position at 230° from B. Position marked OR two intersecting lines.		 M1 M1 A1	± 2° (use overlay). Allow the M marks for dots, crosses or any unambiguous indication that the correct bearings have been offered. F.T. if at least M1 and two intersecting lines. (Lines must originate from point A and point B respectively)
11(b) Some comment about the different nature of the terrain between the points and the finish OR that the route was different in some way. E.g. 'Uphill from B downhill from A', 'there was (*insert obstacle name)* between B and P', 'Krysta wasn't able to run in a straight line', 'easier terrain', 'it was straighter', 'it was flat', 'a more direct route', 'Krysta went the wrong way' etc.		E1	Do not accept any reference to different running speeds or tactics.
12. 4·87		B2	B1 for sight of 4·86(68…) or 4·9(0) or 4·8(0) or 4·870.
13. Sight of 35·5(kg) $23 \times 35{\cdot}5$ = 816·5(kg) AND 'No'.		B1 M1 A1	 F.T. only if $35 \leq$ 'their least value' < 36. (Note SC1) Accept 'Yes' for certain allowed FTs e.g. $23 \times 35{\cdot}9$ B0 M1(FT) = 825·7(kg) AND 'Yes'. A1 *Alternative method 1.* $\frac{825}{35{\cdot}5}$ *M1* *(B1 sight of 35·5)* *= 23·2… AND 'No'* *A1* *Alternative method 2.* $\frac{825}{23}$ *M1* *= 35·8… AND 'No'* *A1* *(Since) bags may only contain 35·5(kg)* *B1* SC1 for $23 \times 36 = 828$ AND 'Yes'. OR $\frac{825}{36} = 22{\cdot}9$ *AND 'Yes'.* *Note that* $\frac{825}{23} = 35{\cdot}8$ *AND 'Yes' is M1A0B0*
14. Beca's total score >21 Beca's median score < 5 Beca's range < 7		 B1 B1 B1	Mark scores given in table. Possible to allow if table not completed if total > 21. Possible to allow if enough of table completed to ensure median < 5. All of table must be completed for this B1. Penalise −1 from any marks gained if a score > 10 is included in the table.

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4351/01

W16-4351-01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: Mathematics in Everyday Life

FOUNDATION TIER

A.M. MONDAY, 11 January 2016

1 hour 15 minutes

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**5**	
2.	**7**	
3.	**4**	
4.	**6**	
5.	**3**	
6.	**8**	
7.	**4**	
8.	**4**	
9.	**6**	
10.	**5**	
11.	**2**	
12.	**4**	
13.	**3**	
14.	**4**	
Total	**65**	

4351 010001

ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

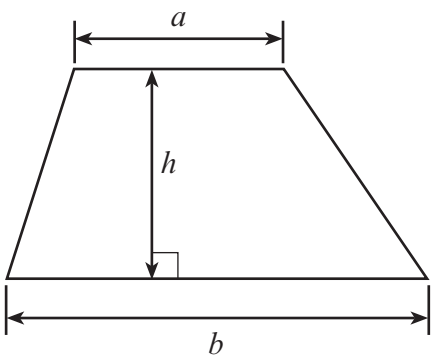
You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **6**.

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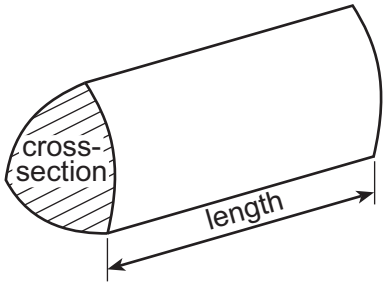
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Formula List

Area of trapezium $= \frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



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Examiner only

1. A builder orders some bricks from *Build Well Supplies*.
To avoid any mistakes, *Build Well Supplies* always notes the number of bricks it delivers both in words and in figures.

(a) Complete the following delivery note. [1]

Build Well Supplies

Delivery note:

To: House plot 8, Fairwell Estate, Highport.

Delivery of :

Sixty thousand, eight hundred and fifty bricks.

..... bricks

(b) Write down the number of bricks delivered, correct to the **nearest 1000**. [1]

.....

(c) The builder uses a tractor and trailer to move the bricks to a nearby field.
The trailer can hold 5000 bricks.
How many journeys must be made with this trailer to move all the bricks? [3]

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5

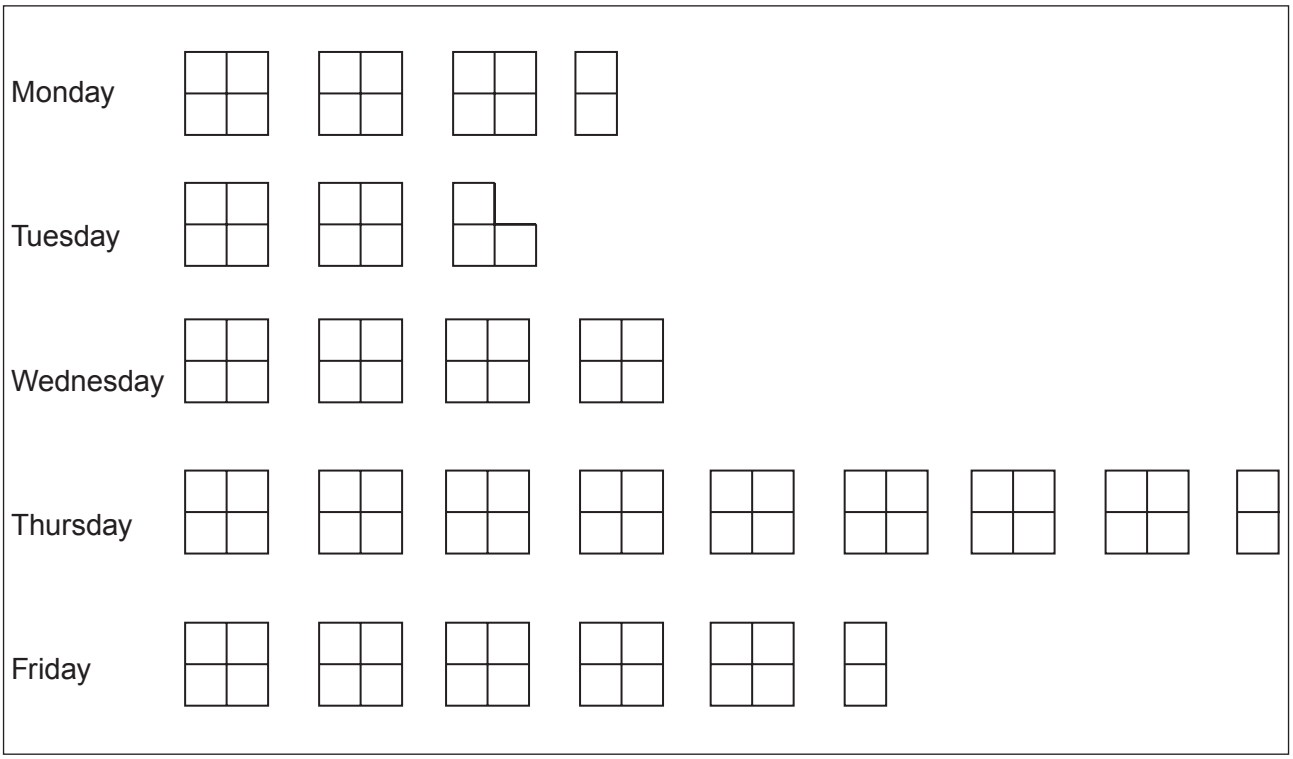
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Examiner only

2. Bottles of water are delivered to a shop each day at 8 a.m.
The pictogram below records how many bottles were delivered each day from Monday to Friday in a particular week.

The symbol  represents 20 bottles.



(a) (i) How many bottles were delivered on Wednesday? [1]

.....

(ii) How many bottles were delivered on Monday? [1]

.....

(iii) How many more bottles were delivered on Wednesday than on Tuesday? [1]

.....

.....

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(b) The shop tries to keep the number of bottles it has in stock at about the same amount for each day.
On which day do you think that the shop **sold** most bottles?
(Remember the pictogram shows the day of delivery of new stock.) [1]

.....

(c) On Saturday, the shop had a delivery of $2\frac{1}{2}$ dozen bottles (1 dozen = 12).

(i) Calculate the number of bottles that were delivered on Saturday. [1]

.....

(ii) Using the same symbol  to represent 20 bottles,

show what the pictogram would be for Saturday. [1]

Saturday

(d) Complete the statement below by writing a number in the blank space.
It must be the **smallest** possible number that will make it a correct statement. [1]

'The symbol used is only useful if the number of bottles is a multiple of .....'

7

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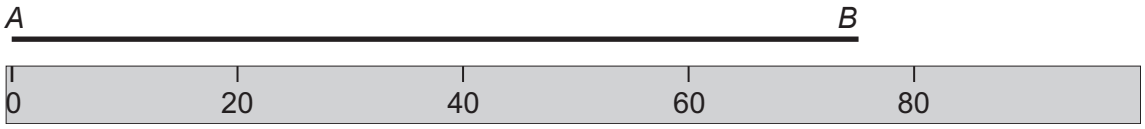
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Turn over.

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Examiner only

3. *(a)* A 1 metre measuring stick is only marked at 20 cm intervals.
Estimate the distance *AB* being measured in the diagram below. [1]



..... cm

(b) Harry throws a javelin in the school sports.

In the diagram below, the ↓ shows where the javelin landed.
Use the scale shown to give the distance Harry threw the javelin. [1]



..... metres

(c) Rhian and Aisha competed in the long jump.
Rhian's best jump was measured as 4·3 metres.
Aisha's best jump was measured as 4 metres and 26 centimetres.

What is the difference in length between the two jumps?
You must give the units of your answer. [2]

.....

.....

Difference in length = ...

4

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4. The total cost of hiring a bus is calculated using the following formula.

total cost = total passenger payment + basic charge

The amount that each passenger pays depends on the total number of passengers, as shown in the table below.

Total number of passengers	Cost per passenger
Fewer than 10	£15
10 to 19	£12
20 to 29	£10.50
30 and over	£8

(a) 40 people hired a bus.

(i) Calculate the **total passenger payment** for these 40 people. [2]

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(ii) The **total cost** was £350.
What was the **basic charge**? [1]

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(b) Fewer than 10 people hired another bus.
The **basic charge** was £80.
The **total cost** was £200.
How many people hired this bus? [3]

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6

Turn over.

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Examiner only

5. Jenny, Marek and Cerys are helping a charity organisation by putting leaflets in envelopes. They were each given the same number of leaflets.

At the end of the day,

Jenny had put 75% of her leaflets into envelopes,

Marek had put $\frac{4}{5}$ of his leaflets into envelopes, and

Cerys had put 0·7 of her leaflets into envelopes.

Who had put the most leaflets into envelopes?
You **must** show all your working to demonstrate how you decided on your answer. [3]

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6. *You will be assessed on the quality of your written communication in this question.*

The rectangular area shown below is to be covered in concrete.

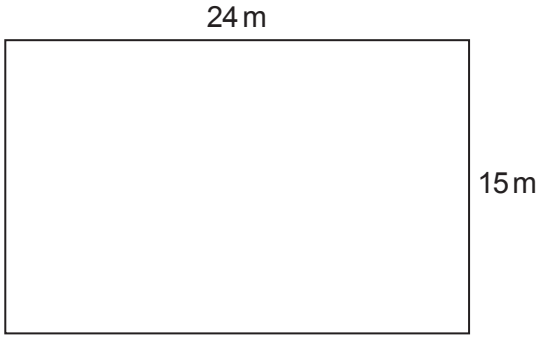


Diagram not drawn to scale.

A fence is to be put up around all four sides.
The fence is to be held in place by 26 posts.

Using the following information, calculate the total cost of the materials needed for this work.

- The cost of concrete is £8 per square metre for the depth needed.
- The cost of the fence is £5 per metre.
- The posts cost £10 each.

You must show all your working. [8]

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7. A group of 8 children and 27 adults took part in a sponsored bicycle relay.
The total distance cycled was 182 miles.

Each child cycled the same distance.
Each adult cycled 6 miles.

How far did each child cycle? [4]

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8. A cake shop has three types of boxes.

- Box A can hold exactly 15 small cakes.
- Box B can hold exactly 20 small cakes.
- Box C can hold exactly 25 small cakes.

(a) At the moment the shop only has 5 boxes of each type (15 boxes in total).

The owner wants to pack 170 small cakes into boxes.
She does not want empty spaces in any box.

Show how this can be done in **two different** ways. [3]

(b) If there were lots of boxes of each size, what is the least number of boxes needed to pack the 170 cakes, with no empty spaces? [1]

4

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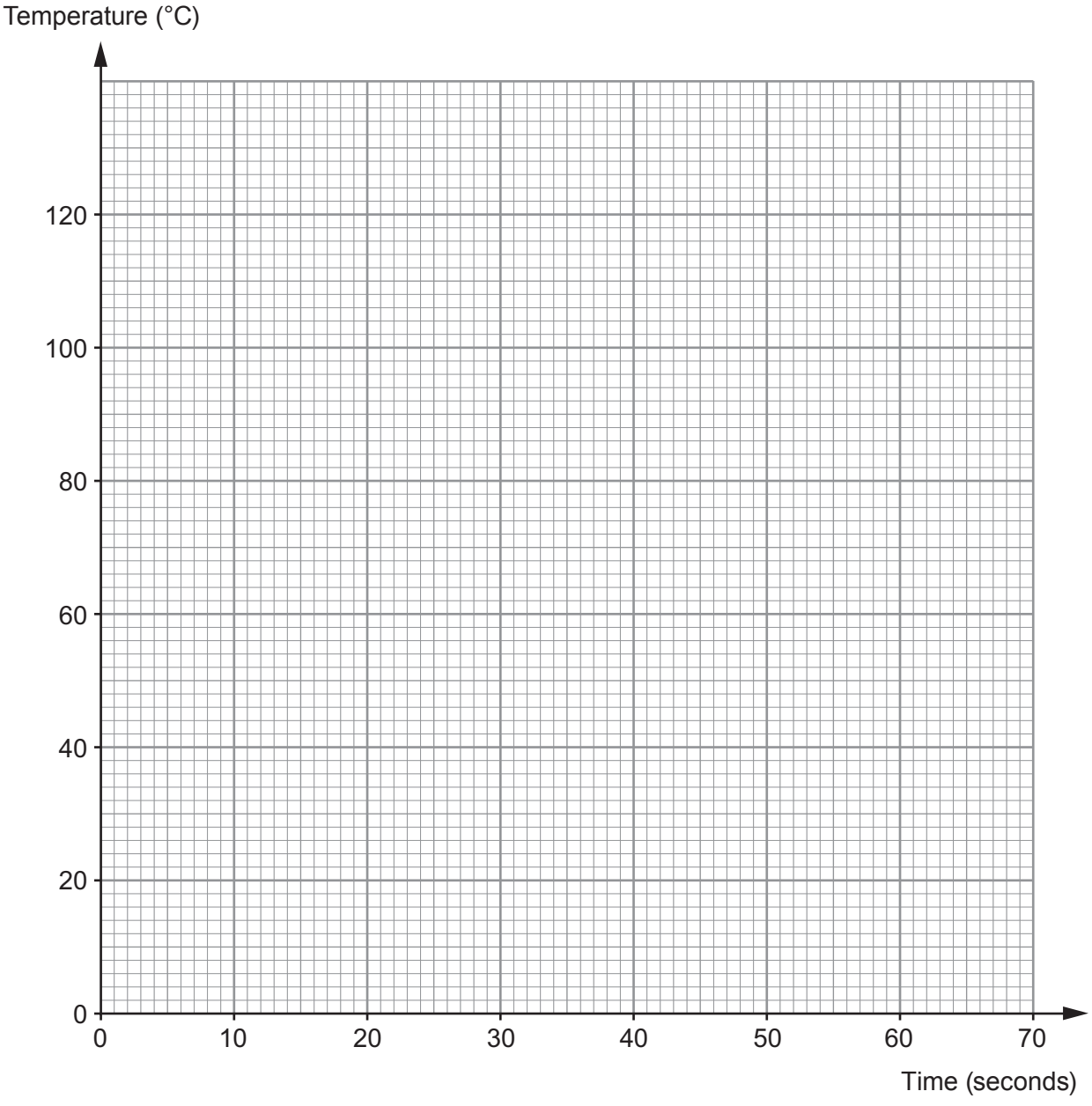
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Examiner only

9. A scientist is conducting an experiment where an object is placed in a temperature-controlled container.
The following four steps are taken after the object is placed in the container.

- Step 1: Set the temperature at 20°C and start the timer.
- Step 2: Increase the temperature at a constant rate of 2°C per second for 30 seconds.
- Step 3: Keep the temperature constant for 10 seconds.
- Step 4: Reduce the temperature at a constant rate so that it is again 20°C at a time of 60 seconds from the start of the experiment.

(a) Show this information on the graph below. [4]



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(b) What was the rate at which the temperature decreased?
Give your answer in °C per second. [2]

.....

.....

.....

Rate of decrease = ... °C per second

6

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Turn over.

Examiner only

10. Rashid went on a trip to Norway.

(a) Before departing, he exchanged £520 into Norwegian kroner.
The exchange rate was £1 = 10.25 kroner.
How many kroner did Rashid receive? [2]

(b) Before departing, he also paid £42.50 for a lake cruise in Norway.
This tour would have cost him 358.75 kroner if he had paid for it in Norway.
Using the same exchange rate, calculate the difference **in pounds** between these two prices. [3]

5

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11. Calculate $\sqrt[3]{(8{\cdot}5-3{\cdot}6)^2}$, correct to 2 significant figures. [2]

.....

.....

2

12. Dewi was driving along a 10 mile stretch of road that had a speed limit of 40 mph.

The time was 14:50 as Dewi's car entered this speed limit zone.
As he left the 10 mile zone, the time was 15:10.

Calculate Dewi's average speed over this 10 mile journey.
Could Dewi have driven faster than the speed limit during this journey? Explain your answer.
[4]

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Turn over.

Examiner only

13. Would a cylindrical can of radius 5 cm and height 14 cm be able to contain 1 litre of liquid? You must show all your working and explain your decision. [3]

3

14. Thomas invests £5720 for 2 years at 3% per annum compound interest.
Find the compound interest earned in the 2 years.
Give your answer correct to the nearest penny. [4]

4

END OF PAPER

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GCSE MARKING SCHEME

JANUARY 2016

MATHEMATICS UNITISED - UNIT 1
FOUNDATION TIER
4351/01

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INTRODUCTION

This marking scheme was used by WJEC for the 2016 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

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January 2016 UNIT 1 Foundation	Mark	FINAL MARK SCHEME Comments (Page 1)
1(a). 60850	B1	
(b) 61000	B1	Accept 'Sixty one thousand' in words.
(c) $\frac{60850}{5000}$	M1	Allow 61000 / 5000. F.T. 'their answer to (a) or (b)'. M1 for continuous addition of 5000 aiming for at least 60000. (Or continuous addition of 5 aiming for at least 60 OR 60 ÷ 5). Similar if following through 'their answer to (a) or (b)'.
= 12(·17)	A1	
13 journeys.	A1	F.T. rounding up if M1 awarded. ISW if they double their answer (i.e. they treat return of empty trailer as a journey).
	5	
2(a) (i) 80	B1	
(ii) 70	B1	
(iii) 25	B1	F.T. 'their (i)' – 55 provided a +ve value.
(b) Wednesday	B1	
(c) (i) 30	B1	
(ii) 	B1	F.T. 'their 30' only if a multiple of 5. Do not accept 'disjointed' symbols.
(d) 5	B1	
	7	
3 (a) Answer between 72 and 78 inclusive.	B1	
(b) 36	B1	
(c) 4 cm. OR 0·04 m.	B1 U1	Must be consistent with numerical value. (e.g. 4m is B1U0, 0·04cm is B1U0) Any other numerical value B0U0.
	4	
4(a) (i) 40 × (£)8	M1	M0 if any addition to or subtraction from 40 × (£)8.
= (£)320	A1	
(ii) (£)30	B1	F.T. £350 – 'their (i)'.
(b) Correct strategy.	S1	Attempt at $n \times 15 + 80$ with $n < 10$.
$\frac{200 - 80}{15}$	M1	M1 implies S1.
= 8 (people)	A1	Any unambiguous embedded answer of 8 gains all three marks.
	6	
5. Finding (75%), 80% and 70% OR 0·75 , 0·8 and (0·7) OR 75/100, 80/100 and 70/100 OR three correct calculations for a common amount AND clearly stating that Marek was the person who put most leaflets in the envelopes.	B3	All correct decimals, OR all correct % OR all correct fractions with a common denominator OR correct work using a common amount of leaflets OR a valid combination that allows comparison AND 'Marek'. B2 for above but 'Marek' not stated OR B2 for having only two correct values and one incorrect value that can be compared, with a correct F.T. name. B1 for having only two correct values that can be compared (with an incorrect name or no name). B1 for unsupported 'Marek'.
	3	

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January 2016 UNIT 1 Foundation	Mark	FINAL MARK SCHEME Comments (Page 2)
6. (Area =) 360 (m^2) (Cost of concrete =) (£)2880 (Perimeter =) 78 (m) (Cost of fence =) (£)390 (Cost of posts =) (£)260 (Total cost =) (£)3530 Look for • spelling • clarity of text explanations • the use of notation (watch for the use of '=', '×' and being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	B1 B1 B1 B1 B1 B1 QWC 2 8	F.T.£ 8 × 'their area'. F.T. £5 × 'their perimeter'. (Maximum of two of the above marks if 'their perimeter' is the same as 'their area'.) F.T. addition of 'their <u>three</u> amounts'. (B0 if more than or less than three amounts used.) QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar. <u>An unsupported answer is QWC0.</u>
7. $182 - 27 \times 6$ = 20(miles) (Distance per child =) $\frac{20}{8}$ = 2½ (miles)	M1 A1 M1 A1 4	F.T. 'their derived 20' (e.g. 182 – 6 = 176, but not 182). Mark final answer.
8(a) Correct strategy (trial) A correct combination. A different correct combination. (b) 7(boxes)	S1 B1 B1 B1 4	Any combination of at least 8 boxes which includes two or three different types, using no more than 5 of any one type, with a correct total (not necessarily 170). Allow any unambiguous presentation of combinations. <u>Box A(15)</u> <u>Box B(20)</u> <u>Box C(25)</u> 1 4 3 2 2 4 3 (0) 5 3 5 1 4 3 2 5 1 3 If no marks gained allow SC1 for a total of 170 using more than 5 boxes of any type. The 7 may be implied. Accept any unambiguous indication of the correct combination. B1 for 1 × 20 (+) 6 × 25. B0 for 20 + 150. Allow an unsupported answer of 7, BUT an answer of 7 from an incorrect method s B0.

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January 2016 UNIT 1 Foundation	Mark	FINAL MARK SCHEME Comments (Page 3)
9. (a) Line starts at (0 , 20). A straight line with gradient 2°C / sec. A straight line from (30,80) to (40,80). A straight line from (40,80) to (60,20). (b) 60(°C) in 20 (seconds) or equivalent. 3	B1 B1 B1 B1 M1 A1 6	Accept plot if no line drawn. Need not end at (30 , 80) *BUT see below*. F.T. from 'their (30,80)'. F.T. 'their (40,80)' . Ignore any line drawn beyond 60 seconds. Penalise −1 once only if no straight lines drawn between plots. *If <u>all four</u> B1s gained but graph incorrect (e.g. first line did not end at (30,80) penalise -1.* OR FT from their graph
10(a) 520 × 10·25 = 5330 (kroner) (b) 358.75 ÷ 10·25 = (£)35 (A difference of) (£)7.5(0)	M1 A1 M1 A1 A1 5	 Mark final answer. OR (42.50 × 10·25) – 358.75 M1 (or 76.875) ÷ 10·25 m1 = (£)7.5(0) A1 F.T. £42.50 – 'their £35'.
11. 2·9	B2 2	B1 for 2·8(8…..)
12. Attempt at using Speed = distance / time. (Average speed =) 10 / ⅓ or equivalent = 30(mph) Yes he could have gone over the speed limit as the 30mph is only an average speed. E.g. 'Yes because it's only an average (speed)' (E1) 'Yes, he could have gone faster, then slower' (E1) BUT 'Yes he could have gone faster'. (E0).	M1 m1 A1 E1 4	e.g. 10(miles) / 20(min) or 10 / 'their time difference'. C.A.O. Independent mark. Must state, or unambiguously imply, 'Yes' AND give a clear explanation. FT 'their average speed' <u>provided</u> it is 40mph or less.
13. (Volume =) $\pi \times 5^2 \times 14$ = 1099·5(..) (cm^3) or 350π. 'Yes' because 1 litre is (only) 1000cm^3	M1 A1 B1 3	 Accept answers between 1099 and 1100 inclusive. F.T. from 'their <u>derived</u> cylinder volume'. 350π must be evaluated for comparison. Must indicate that 1 litre equals 1000(cm^3). 'Yes' may be implied.
14. 5720 <u>171.6(0)</u> 5891.6(0) <u>176.74(8)</u> 6068.34(8) or 6068.35 OR 171.6(0) and 176.74(8) (£)348.35	B1 M1 A1 A1 4	For a correct evaluation of 3% OR Sight of 1·03 (343.2 implies 2× 171.6 and gains B1). For correctly attempting to find 2 different 3%. OR 5720 × $1·03^2$. F.T. one error. Must be given correct to the nearest penny. (£) 348.34 is B1M1A1A0. Treat depreciation as a misread.

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4351/01

S15-4351-01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: Mathematics in Everyday Life

FOUNDATION TIER

A.M. THURSDAY, 21 May 2015

1 hour 15 minutes

ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **1***(a)*.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**8**	
2.	**4**	
3.	**4**	
4.	**2**	
5.	**4**	
6.	**6**	
7.	**4**	
8.	**6**	
9.	**2**	
10.	**8**	
11.	**3**	
12.	**4**	
13.	**2**	
14.	**4**	
15.	**4**	
Total	**65**	

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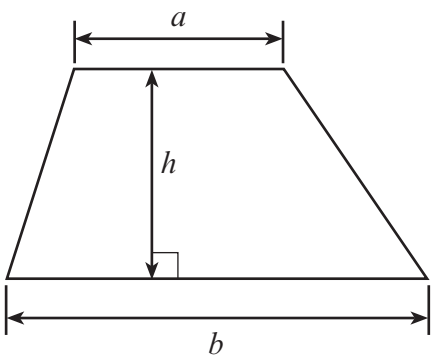
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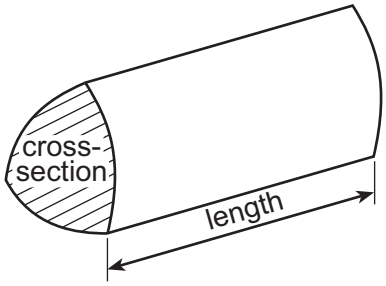
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Formula List

Area of trapezium $= \frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



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1. Mr and Mrs Jones and their four children, aged 12, 9, 7 and 4 years old, visit a toy fair. The cost of tickets to the fair is shown on a board.

TOYS ACROSS THE AGES

Adults £15 each

Half price for children under 14 years old

Free entry for the Under 5s

(a) *You will be assessed on the quality of your written communication in this part of the question.*

What is the total cost of the tickets for Mr and Mrs Jones and the children to visit the toy fair?
Show all your working. [6]

(b) Mrs Jones had a voucher that gave a discount of 10% off the total cost of their tickets. How much did they actually pay for their tickets? [2]

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2. The number of cars using a town's main car park each day was recorded during the month of February.
The numbers are recorded below.

256	218	242	231	207	241	173
242	193	212	267	241	208	245
260	199	276	280	234	239	187
212	236	195	178	251	204	188

Using **equal** class intervals, complete the following table. [4]

Number of cars	170 to 199	200 to 229		260 to 289
Tally	𝍸 //			
Frequency	7			

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3. Eight friends hire a mini-bus for 12 days.
The hire cost is to be shared equally between the eight friends.

The cost of hiring the mini-bus is given by the formula

hire cost = £45 x number of days + fixed charge

Calculate how much each friend should pay when the fixed charge is £50. [4]

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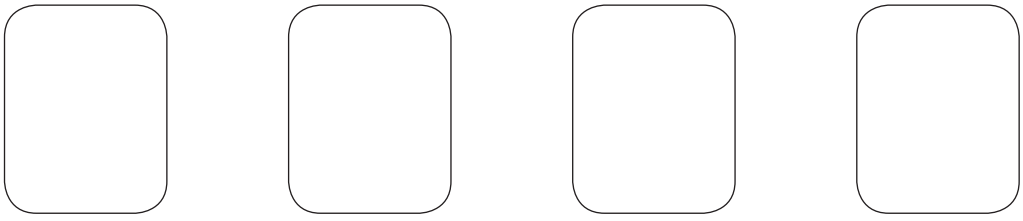
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4. Four cards showing the digits 2, 3, 4 and 5 are used on a display board to show the total number of people at a concert.
The following two facts are known.

- There were between four thousand and four thousand, five hundred people at the concert.
- **Exactly** half of the people at the concert were under 30 years old.

Using only the four cards showing the digits 2, 3, 4 and 5, give the number of people at the concert. [2]



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5. Annya lives in Sheffield.
She needed to be at a meeting at a hotel in Leeds at 3:00 p.m.

In planning her journey, she allowed herself 45 minutes to travel from the station at Leeds to the hotel.
She wanted to catch the latest possible train from Sheffield to be sure of arriving at the hotel in Leeds in time.

Part of the train timetable she used is shown below.

Sheffield (depart)	12:28	13:21	13:36	14:17	14:28
Leeds (arrival)	13:59	14:02	14:47	15:18	15:59

Annya caught the train she wanted, and the train arrived at Leeds station on time.
It took a total of 25 minutes for her to find a taxi and to travel from the station to the hotel.

Calculate the total time taken between Annya departing from Sheffield and arriving at the hotel in Leeds. [4]

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Time taken = ...

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6. Two groups of six people took part in a quiz.

(a) The six members of group A gained the following scores.

52 29 78 56 24 37

(i) Calculate the mean score per person. [3]

.....

.....

.....

.....

(ii) What was the range of the scores gained? [1]

.....

(b) The scores gained by the six members of group B are summarised below.

Score	Number of people
22	2
25	2
26	1
28	1

(i) Without doing any further calculations, state which group had the larger mean score per person.
You must give a reason for your choice. [1]

.....

.....

(ii) Which group had the larger range of scores?
You must give a reason for your choice. [1]

.....

.....

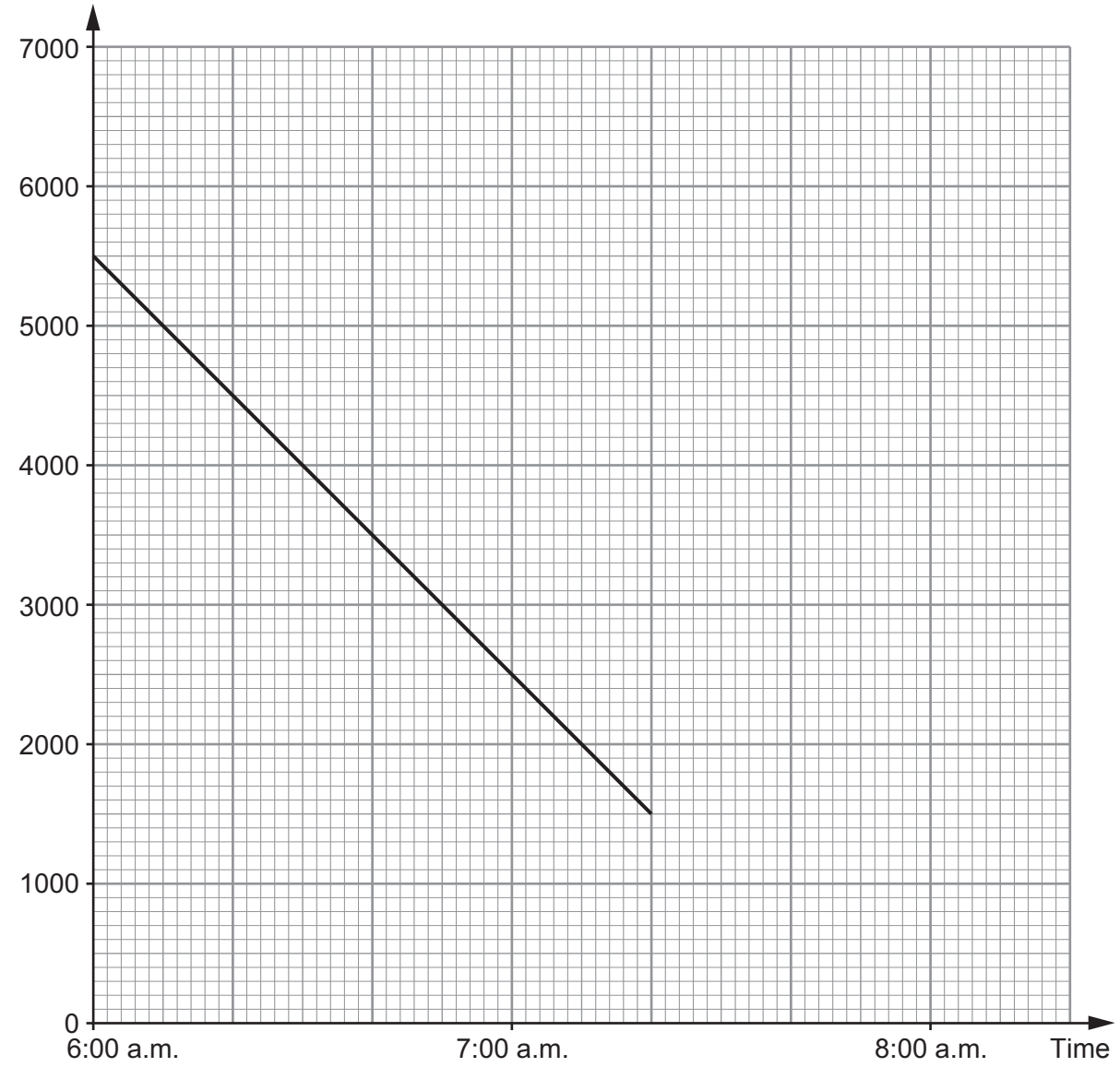
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7. A water tank can hold up to 7000 litres of water.
At 6:00 a.m. a tap is opened to empty the tank of any water it contains.
The water then drains away at a constant rate until the tank is empty.
The graph below shows the volume of water in the tank for part of the time it takes to completely empty the tank.



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(a) How many litres of water were in the tank at 6:00 a.m.? [1]

..... litres

(b) At what time was the tank exactly half full? [1]

.....

(c) How long did it take for the tank to empty after the tap was opened? [2]

.....

.....

.....

.....

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8. A large solid cuboid has dimensions 2 metres by 3 metres by 5 metres.
Each cubic metre of the solid cuboid weighs 240 kg.

The cuboid is cut into four identical shapes.
During this cutting process, 5% of the cuboid's weight is lost.

Calculate the weight of each of the four shapes. [6]

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9. There are 1760 yards in a mile.

How many yards are there in a kilometre? [2]

10. Alice borrowed her mum's car to drive to see her friend Alun.

(a) She completed the journey of 225 miles in 4 hours 30 minutes.
Calculate her average speed for the journey. [3]

(b) The car used 1 gallon of petrol for every 40 miles travelled.
After Alice had driven back home, she replaced all the petrol she had used on her trip.
Assuming that 1 gallon is approximately 4·546 litres, find the least whole number of litres of petrol that Alice bought. [5]

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11. Nerys wants to test the following hypothesis.

'Dog owners are fitter than the average person.'

She plans to:

- hand out a short questionnaire between 9 a.m. and 10 a.m., as people arrive at a local dog show,
- ask the following questions in the questionnaire,

(i) How fit are you?

(ii) How often do you walk your dog?

1 – 5 times ☐ 6 – 10 times ☐ 10 or more times ☐

- collect the completed questionnaires between 4 p.m. and 5 p.m., as people are leaving the dog show.

Write down **three** unfavourable comments about this plan. [3]

1. .....

.....

.....

2. .....

.....

.....

3. .....

.....

.....

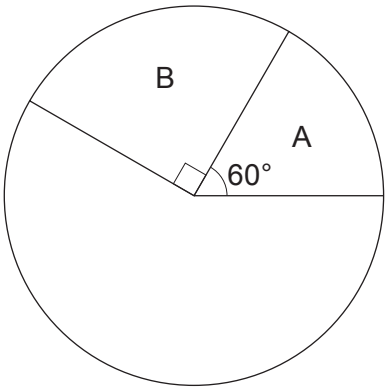
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12. A number of people were asked to choose which of four brands of ice cream they liked the most. The brands were labelled A, B, C and D respectively.

Dimitar has begun to show the results using a pie chart.



He knows that:

- 10 people chose brand A,
- 30 people chose brand C.

Calculate how many people chose brand D. [4]

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13. Evaluate $\sqrt{25{\cdot}6^3 - 17{\cdot}2}$, correct to two significant figures. [2]

.....

.....

14. Elfed invests £3500 for 2 years at 1·5% per annum compound interest.
Calculate the value of his investment at the end of the 2 years.
Give your answer correct to the nearest penny. [4]

.....

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15. Sofia had planned to exchange £300 for euros during a visit to the local town one Saturday. She had checked the exchange rate for that day, and found it to be £1 = 1.20 euros.

Unfortunately, she had to cancel her visit to town that day, and it was not until the following Saturday that she was able to exchange her £300 for euros.
By this date the exchange rate was £1 = 1.17 euros.

How many fewer euros did she receive due to this delay?
What percentage loss was caused by this delay? [4]

END OF PAPER

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Question number	Additional page, if required. Write the question number(s) in the left-hand margin.

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GCSE MARKING SCHEME

MATHEMATICS - UNITISED

SUMMER 2015

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INTRODUCTION

The marking schemes which follow were those used by WJEC for the Summer 2015 examination in GCSE MATHEMATICS - UNITISED. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

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UNIT 1 - FOUNDATION TIER

June 2015 UNIT 1 Foundation	✓	Mark	Comments
1. **Ribbon marking for 1(a) and 1(b).** (a) (Two adult tickets = 2 × £15 =) (£)30 (One child's ticket =) (£)7.5(0) (Three child's tickets = 3 × £7.50 =) (£)22.5(0) (Total cost =) (£)52.5(0) Look for • spelling • clarity of text explanations and correct units shown • the use of notation (watch for the use of '=' and '+' being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	✓ ✓ ✓ ✓ ✓ ✓	B1 B1 B1 B1 QWC 2	Sight of (£)7.5(0) or may be implied in further work. F.T. 3 × 'their £7.50' , but **not** 3 × £15 F.T. 'their amounts' but not if simply £15 or £7·50. Correct answer gains B4. QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar. <u>An unsupported answer is QWC0.</u>
Ribbon marking for 1(a) and 1(b). 1(b) (£)47.25		B2	F.T. 0·9 × 'their total cost'. B1 for (£)5.25 OR a correct evaluation of 0·1 × 'their total cost'.
2. (170 – 199) (200 – 229) **230 – 259** (260 – 289) Using a tally convention. (7) 6 11 4	✓ ✓ ✓ ✓	B1 B1 B2	Need not be accurate. B2 for all three correct. B1 for 1 or 2 correct.
3. (Total cost =) 45 × 12 + 50 = (£)590 (Each paid) £590 ÷ 8 = (£)73.75	✓ ✓ ✓ ✓	M1 A1 M1 A1	M0 if 45 × 12 not attempted. E.g. '45×12+50 = 45×62 OR '45×12+50 = 107' are both M0. F.T. 'their 590' ÷ 8.
4. 4 3 5 2		B2	B1 for 4325 or 4235 or 4253 OR B1 for any even number using all given digits once only.
5. 13:21 train from Sheffield chosen. Attempt to find time difference between 14:02 and 13:21 = 41 (min) (So total time =) 66 (min) or equivalent.	✓ ✓ ✓ ✓	B1 M1 A1 B1	May be implied in further work. F.T. for 'their chosen train' (Other trains take 1hr 31m, 1hr 11m, 1hr 1m, 1hr 31m) F.T. time for 'their train journey' + 25min. *<u>Alternative method</u>* *(Arrives at Leeds station) 14:02* *B1* *F.T. 'their train arrival' + 25min* *(Arrives at hotel) 14:27* *B1* *F.T. 'their times'* *Attempt to find time difference between 14:27 and 13:21* *M1* *(So total time =) 66 (min) or equivalent.* *A1*

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June 2015 UNIT 1 Foundation	✓	Mark	Comments
6(a)(i) 52 + 29 + 78 + 56 + 24 + 37 (= 276) 276 ÷ 6 = 46		M1 m1 A1	For an attempt to add the scores. Allow if one score 'missed'. F.T. 'their total'. C.A.O. Mark final answer.
6(a)(ii) (Range =) 54		B1	
6(b)(i) Group A AND Reference to higher scores in group A		B1	B0 if full calculation (2×22 + 2×25 + 1×26 + 1×28) / 6 is seen
6(b)(ii) Group A AND Reference to group B's scores only between 22 and 28.		B1	Allow 'Group A, they are more spread out'. Accept 'B's range is (only) 6
7(a) 5500		B1	
7(b) 6:40 (a.m.)		B1	
7(c) Graph extended to show zero litres 1 (hr) 50 (min) or equivalent		M1 A1	Allow M1 for sight of 7:50(a.m.) ± 2min. *Alternative method* *Correct rate of flow given e.g. 50litres per minute M1* *110 minutes or equivalent A1*
8. (Volume of cuboid =) 2 × 3 × 5 = 30(m^3) (Weight of cuboid =) 7200 (kg) 0·95 × 7200 or 7200 – 0·05 × 7200 = 6840 (kg) (Weight of each shape =) 1710(kg)	✓ ✓ ✓ ✓ ✓ ✓	M1 A1 B1 M1 A1 B1	F.T. 'their volume' × 240. F.T. 'their weight' including 240(kg). F.T. 'their 6840' ÷ 4. *Alternative method for final three marks.* *Sight of 1800(kg) F.T. 'their 7200' /4 B1* *0·95 × 1800 or 1800 – 0·05 × 1800 M1* *= 1710 (kg) A1* *Alternative method* *2 ×3 × 5 M1* *= 30(m^3) A1* *0·95 × 30 M1* *= 28·5(m^3) A1* *(× 240) 6840(kg) B1 0R (÷ 4) 7·125(kg)* *(÷ 4) 1710(kg) B1 OR (× 240) 1710(kg).*
9. Use of 0·625 × 1760 or equivalent (Approximately) 1100		M1 A1	Allow answers between 1090 and 1110 inclusive.
10(a) Use of 'Distance' / 'Time' (Average speed =) 225 / 4·5 OR 225 / 270 = 50 (mph) OR 0·83(…) miles per min.		M1 m1 A1	Allow time as 4(h) 30(min) or 4:30 or 4·3 or 270 for M1 '25 miles per ½ hour' gains M1m1. C.A.O. Units must be given if in miles per min.
10(b) 450 / 40 = 11·25 (gallons) 11·25 × 4·546 (Litres bought =) 52	✓ ✓ ✓ ✓ ✓	M1 A1 M1 A2	SC1 for 5·625 (gallons). Do not allow the A1 (or SC1) if 'rounded' value used for next calculation. F.T. 'their 11·25' × 4·546. A1 for 51(·1425). Similarly A1 for a 'correct' F.T. answer that is not rounded up to nearest whole number.

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June 2015 UNIT 1 Foundation	✓	Mark	Comments
11. Three different valid comments. e.g. 'Not representative of population'		B3	*Ignore irrelevant statements.* B1 for each different valid comment. Accept equivalent statements e.g. 'Biased' (by interest group). Do not give more than one mark for similar criticism(s).Reference to location should only be credited once.
'Fitness not defined' or 'Vague' or 'No options given'.			(criticisms of question (i)) Treat these three as similar comments.
'Might not have a dog' or 'No room for 'Never''			(criticisms of question (ii)) Treat these two as similar comments.
'Does not specify over what period of time', 'Can tick one of two boxes if answer is 10'			These are different comments.
'People might have left the show before 4p.m.' 'People might arrive later than 10a.m.'			(criticism of the method of distribution / collection) Treat these two as similar criticisms.
12. 1 person represented by 6° OR (B =) $10 \times \frac{90}{60}$ OR (Total =) $10 \times \frac{360}{60}$	✓	M1	
(B =) 15	✓	A1	Implies M1.
(Total =) 60	✓	A1	Implies M1.
(D =) 5 (people)	✓	A1	F.T. 'their 60' – 'their 15' – 10 – 30. *Alternative method* *C total represented by 180° B1* *D total represented by 360 – (60 + 90 + 180) M1* *= 30° A1* *(D =) 5 (people) A1*
13. 130		B2	B1 for sight of 129(·4...) or 129·5
14. 3500 52·50 3552·50 53.28(75) 3605.78(75) (£) 3605.79 OR 360579(p)	✓ ✓ ✓ ✓	B1 M1 A1 A1	For the evaluation of a correct 1·5% OR Sight of 1·015 (105 or 3605 imply use of 2× 52·5 and gain B1) For correctly attempting to find 2 different 1·5%. OR $3500 \times 1{\cdot}015^2$. C.A.O. F.T. one arithmetic error. Must be to nearest penny. Accept £3605.79p. Do not accept 3605.79p. Mark final value of investment (i.e. do not penalise if they continue to give £105.79 *If extra year OR depreciation mark accordingly, then penalise −1.*
15. 1·20 × 300 – 1·17× 300 or equivalent. = 9 (euros)	✓ ✓	M1 A1	
$\frac{1{\cdot}20 \times 300 - 1{\cdot}17 \times 300}{1{\cdot}20 \times 300}$ (× 100) or equivalent. = 2·5 (%)	✓ ✓	M1 A1	F.T. 'their 9 euros' for numerator value.
			Alternative method *$\frac{1{\cdot}20 - 1{\cdot}17}{1{\cdot}20}$ (× 100) M1* *= 2·5 (%) A1* *F.T. 'their 2·5%'* *0·025 × 300 × 1.2(0) or equivalent. M1* *= 9 (euros) A1*

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June 2015 **UNIT 1 Higher**	✓	**Mark**	**Comments**
1. (Price reduction =) 0·15 × (£)720	V	M1	
= (£)108	V	A1	M2 for 0·85 × 720
(New price = £720 – £108 =) (£)612	V	A1	F.T. £720 – 'their £108'.
(Monthly payment =) (£)612 ÷ 12	V	M1	F.T. 'their £612'.
= (£)51	V	A1	
			Alternative methods *(Original monthly payment =) (£)720 ÷ 12* *M1* *= (£)60* *A1* *(Monthly reduction =)* 0·15 × (£)60 *M1 FT* *= (£)9* *A1* *(Monthly payment =) (£)51* *A1* *OR* *(Price reduction =) 0·15 × (£)720* *M1* *= (£)108* *A1* *(Monthly saving = £108/12 =) (£)9* *B1 FT* *(Monthly payment=) 720/12 – 9* *M1* *= (£)51* *A1* *Note: Allocate marks for one method only (do not 'mix and match'). Use method that maximises total mark.*
Look for • spelling • clarity of text explanations and correct units shown • the use of notation (watch for the use of '=' , '+', '–', '×' and '÷' being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	V V	QWC 2	QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar. An unsupported answer is QWC0.
2. Three different valid comments. e.g. 'Not representative of population' 'Fitness not defined' or 'Vague' or 'No options given'. 'Might not have a dog' or 'No room for 'Never'' 'Does not specify over what period of time', 'Can tick one of two boxes if answer is 10' 'People might have left the show before 4p.m.' 'People might arrive later than 10a.m.'		B3	*Ignore irrelevant statements.* B1 for each different valid comment. Accept equivalent statements e.g. 'Biased' (by interest group). Do not give more than one mark for similar criticism(s).Reference to location should only be credited once. (criticisms of question (i)) Treat these three as similar comments. (criticisms of question (ii)) Treat these two as similar comments. These are different comments. (criticism of the method of distribution / collection) Treat these two as similar criticisms.

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June 2015 UNIT 1 Higher	✓	Mark	Comments
3. 1 person represented by 6° OR (B =) $10 \times \frac{90}{60}$ OR (Total =) $10 \times \frac{360}{60}$	✓	M1	
(B =) 15	✓	A1	Implies M1.
(Total =) 60	✓	A1	Implies M1.
(D =) 5 (people)	✓	A1	F.T. 'their 60' – 'their 15' – 10 – 30. *Alternative method* *C total represented by 180° B1* *D total represented by 360 – (60 + 90 + 180) M1* *= 30° A1* *(D =) 5 (people) A1*
4. Sight of (area of ABCF =) $2000(m^2)$	✓	B1	
(Area of FCDE =) $\frac{(50 + 10)}{2} \times 20$	✓	M1	Allow M1 for correct intent, e.g missing brackets '50 +10 × 0·5 × 20'.
$= 600(m^2)$	✓	A1	C.A.O.
(Total area =) $2600(m^2)$	✓	A1	F.T. 'sum of their two values'.
5. 3500 52·50 3552·50 53.28(75)	✓	B1	For the evaluation of a correct 1·5% OR Sight of 1·015
	✓	M1	(105 or 3605 imply use of 2× 52·5 and gain B1) For correctly attempting to find 2 different 1·5%.
3605.78(75)	✓	A1	OR $3500 \times 1{\cdot}015^2$. C.A.O.
(£) 3605.79 OR 360579(p)		A1	F.T. one arithmetic error. Must be to nearest penny. Accept £3605.79p. Do not accept 3605.79p. Mark final value of investment (i.e. do not penalise if they continue to give £105.79) *If extra year OR depreciation mark accordingly, then penalise −1.*
6. $1{\cdot}20 \times 300 - 1{\cdot}17 \times 300$ or equivalent.	✓	M1	
= 9 (euros)	✓	A1	
$\frac{1{\cdot}20 \times 300 - 1{\cdot}17 \times 300}{1{\cdot}20 \times 300}$ (× 100) or equivalent.	✓	M1	F.T. 'their 9 euros' for numerator value.
= 2·5 (%)	✓	A1	*Alternative method* *$\frac{1{\cdot}20 - 1{\cdot}17}{1{\cdot}20}$ (× 100) M1* *= 2·5 (%) A1* *F.T. 'their 2·5%'* *0·025 × 300 × 1.2(0) or equivalent. M1* *= 9 (euros) A1*
7. B D F		B3	B1 for each.
8.(a) An explanation that refers to enough (all) of the 162 people in the 18-25 group could be under 20 AND enough (all) of the 341 people in the 41-60 group could be under 50		B2	B1 if the explanation refers to only one of these facts. B1 for an explanation that only refers to the fact that we can't tell, e.g. 'Don't know how many under 20 and how many over 50'.
8.(b) (61 – 17 =) 44(years)		B1	Accept 43< range ≤ 44

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June 2015 UNIT 1 Higher	✓	Mark	Comments
9. **Ribbon marking for 9(a) and 9(b).** (a) $-30\cdot6(0) = 2\cdot99 \times 60 - 0\cdot7M$ $M = \frac{2\cdot99 \times 60 + 30\cdot6(0)}{0\cdot7}$ $= 300$ (cards)		M1 m1 A1	C.A.O. If no marks gained allow SC1 for 212(·5…). SC2 for 213.
Ribbon marking for 9(a) and 9(b). (b) $\frac{300 \times 0\cdot7}{2\cdot99}$ or equivalent (Minimum number =) 71 (cards)		M1 A1	F.T. 'their 300'. Allow M1 for any attempt at finding how many '2·99 there are in 210'. E.g. 'Repeated additions of 2·99 aiming for 210.' OR 'trial and improvement of S × 2·99 aiming for 210.' M1, A0 for an answer of 70(·2...)
10. Sight of 275(cm) or 2·75(m) ('biggest shed') Sight of 3550(cm) or 35·5(m) ('smallest wall') $\frac{3550}{275}$ or $\frac{35\cdot5}{2\cdot75}$ $= 12\cdot9(...)$ Clear statement that 13 sheds will not always fit.	V V V V V	B1 B1 M1 A1 A1	F.T 'their smallest wall' only if 'their biggest shed' 'their smallest wall if $3500 \le w < 3600$ AND 'their biggest shed' if $270 < s \le 280$. or equivalent in metres. *Alternative methods (for M1A1A1)* *13 × 2·75* *M1* *= 35·75(m)* *A1* *Clear statement that they will not fit.* *A1* *OR* *35·5 / 13* *M1* *= 2·73....* *A1* *Clear statement that they will not fit* *A1*
11 Stating 5cm represents 44yards AND 3cm represents 24 metres. Equating a 'common cm. value' representing both yards and metres correctly. e.g. 1cm ≡ 8·8 yards and 1cm≡ 8 metres so 8metres = 8·8 yards 1 metre = 1·1 yards		B1 M1 A1	Accept any unambiguous statement. Implies previous B1. No F.T. from a B0. Allow sight of 'corresponding' values. E.g. sight of 8 and 8·8. Also e.g. 15cm ≡ 132 yards and 15cm≡ 120 metres so 120 metres = 132 yards. Allow equivalent fractions e.g. 11/10, 88/80, 132/120 etc.
12. $20 \times \frac{360}{420}$ or equivalent. $\times \frac{8}{5}$ or equivalent. $= 27\cdot4(....)$ 28 (people required).	V V V V	M1 M1 A1 B1	M2 for correct use of the '20' with all four of the numbers 360, 420, 8 and 5. M1 for correct use of the '20' with any two of the numbers 360, 420, 8 and 5. C.A.O. (to 1dp) F.T. rounding up.
13(a) Use of $310^{(o)}$ (Area =) $\frac{360 - 50}{360} \times \pi \times 12^2$ $= 389\cdot5(.....)(cm^2)$ or 124π.		B1 M1 A1	Must be used with π. M2 for $\pi 12^2 - \frac{50}{360} \times \pi \times 12^2$ Accept answers between 389·35 and 389·75 inclusive. Allow $390(cm^2)$ from correct work. SC1 for $62\cdot8(.....)(cm^2)$ or 20π.
13. (b) $\frac{50}{360} \times 2 \times \pi \times 12$ $= 10\cdot4(7..)(cm)$ or $10\cdot5(cm)$ or $10\pi/3$. (Perimeter =) $10\cdot4(7..) + 24$ $= 34\cdot4(7..)$ (cm)	V V V V	M1 A1 M1 A1	F.T. 'their derived 10·4(7..)' + 24. 'Their derived 10·4(7..)' must involve the use of π.

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June 2015 UNIT 1 Higher	✓	Mark	Comments
14. (Volume of cylinder =) $\pi \times r^2 \times 6r$	V	B1	
(Volume of hemisphere =) $\frac{2}{3} \times \pi \times (2r)^3$	V	B1	Or equivalent e.g. $16\pi r^3 / 3$
$6\pi r^3 + \frac{16\pi r^3}{3} = 3244{\cdot}48$ or equivalent	V	M1	F.T. for 'their volumes' only if Vol. cylinder = $a \times \pi r^3$ AND Vol. hemisphere = $b \times \pi r^3$ with $a \neq b$
$r^3 = 91(\cdot 1\ldots)$	V	A1	C.A.O.
$r = 4{\cdot}5$	V	A1	F.T cube root of 'their 91·1..'.
(Height of part =) 36(cm)	V	B1	F.T. 8 × 'their 4·5'.
15. Use of Time taken = $\frac{\text{Distance travelled}}{\text{Speed}}$		M1	Allow numerical examples or use of symbols.
Sight of $\frac{\text{Distance} / 2}{\text{Speed} \times 2}$ (+) $\frac{\text{Distance} / 2}{\text{Speed} / 2}$		M1	'Distance' and 'Speed' used must be consistent with those of previous M1.
Convincing explanation of why Diego's statement is not correct.		A1	Sight of correct numerical calculations sufficient for A1. *Examples of acceptable solutions* *(i) (Time at constant speed =) D/V* M1 *Sight of* $\frac{½D}{2V} + \frac{½D}{½V}$ *M1* *Convincing explanation e.g.* $\frac{5D}{4V} > (\text{or} \neq) \frac{D}{V}$ or $\frac{D}{4V} + \frac{D}{V} > (\text{or} \neq) \frac{D}{V}$ *A1* *(ii) Using numerical values e.g.100 miles at 50mph* *(Time at constant speed =) 100/50 (=2hrs)* M1 *Sight of* $\frac{50}{100} + \frac{50}{25}$ *M1* *Convincing explanation e.g.* *2½(hrs) >(or≠) 2(hrs)* *A1* *Also accept a statement, e.g.* *'So they are not the same', if two correct calculations have been made.*

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4351/01

W15-4351-01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: Mathematics in Everyday Life

FOUNDATION TIER

A.M. FRIDAY, 9 January 2015

1 hour 15 minutes

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**4**	
2.	**6**	
3.	**3**	
4.	**5**	
5.	**3**	
6.	**7**	
7.	**4**	
8.	**6**	
9.	**7**	
10.	**3**	
11.	**3**	
12.	**5**	
13.	**5**	
14.	**4**	
Total	**65**	

4351 010001

ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **6**.

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1. Twenty-five thousand and sixty-eight people have signed a petition.

(a) Write this number in figures. [1]

.....

(b) The organisers of the petition hope to get 30 000 people to sign.
How many more signatures do they need to reach this target? [1]

.....

.....

.....

(c) In the end they managed to get 30 810 signatures.

(i) Write this number correct to the nearest 1000. [1]

.....

(ii) The organisers had asked around 63 000 people to sign the petition.
Which **one** of the following fractions,

$$\frac{1}{10} \qquad \frac{1}{5} \qquad \frac{1}{4} \qquad \frac{1}{3} \qquad \frac{1}{2}$$

should be inserted in the statement below to make it accurate? [1]

'Nearly ..... of the people asked signed the petition.'

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2. Fifty people who regularly visit the cinema were asked which of four types of film they preferred. The four types of film were Comedy (C), Adventure (A), Science Fiction (SF) and Romantic (R). The answers given are recorded on the grid below.

A	R	C	SF	R	C	C	SF	A	C
SF	SF	R	C	R	C	SF	C	SF	R
R	C	C	SF	C	R	R	C	C	SF
C	A	C	R	SF	R	A	A	R	C
A	R	A	C	A	C	A	A	C	R

(a) Complete the frequency table below. [2]

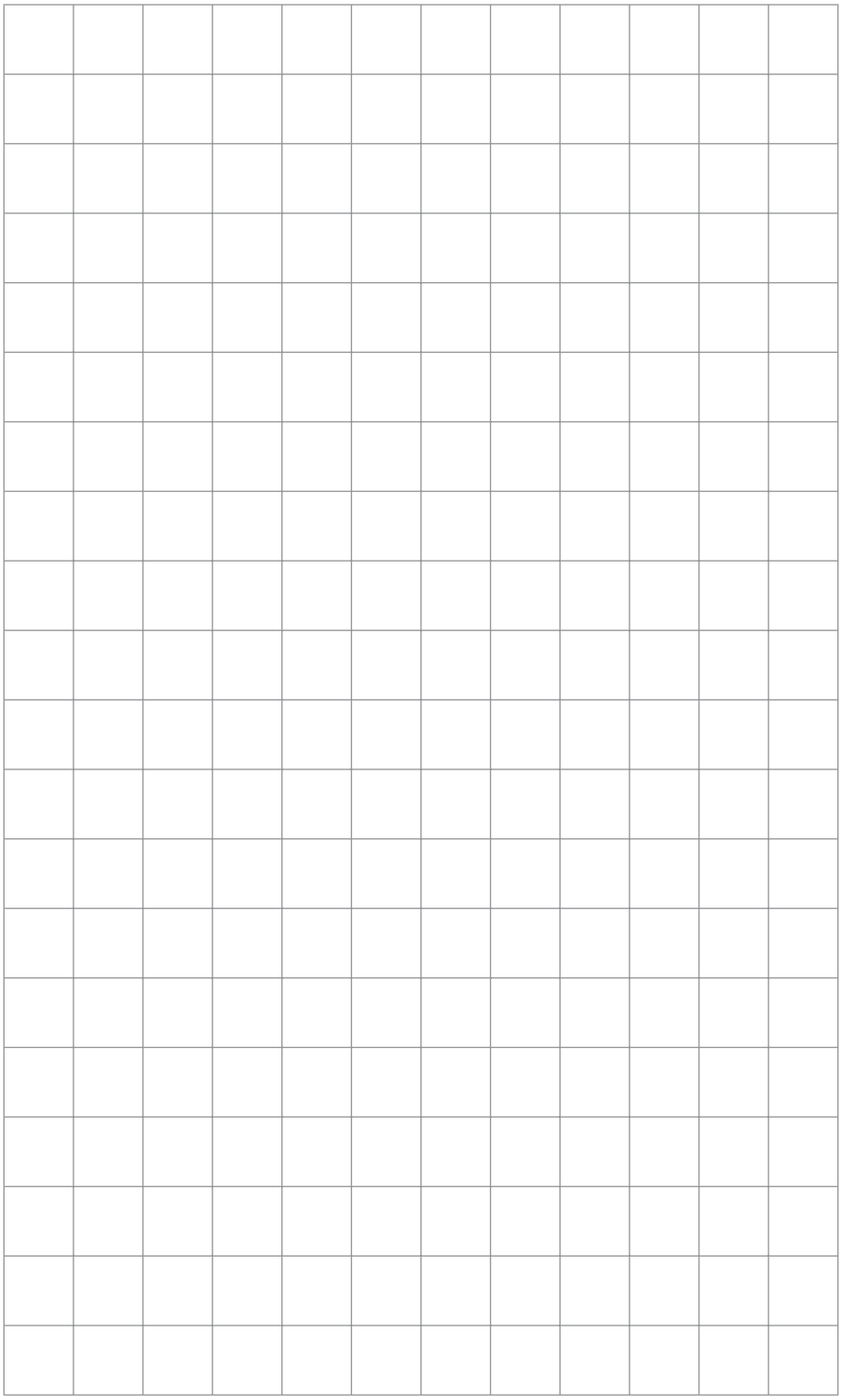
Type of film	Tally	Frequency
Comedy (C)		
Adventure (A)		
Science Fiction (SF)		
Romantic (R)		

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(b) Draw a bar chart to display the results. [4]



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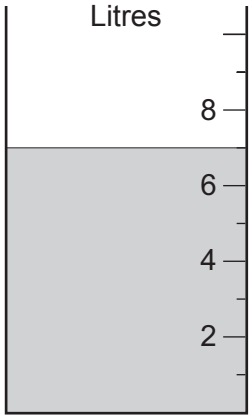
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Turn over.

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3. *(a)* The diagram below shows a glass container holding some water.

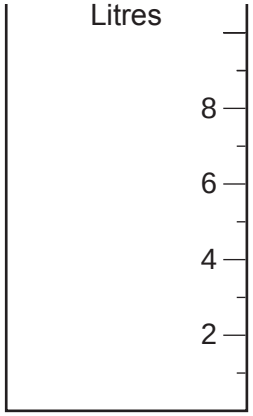


(i) What is the volume of water in the container? [1]

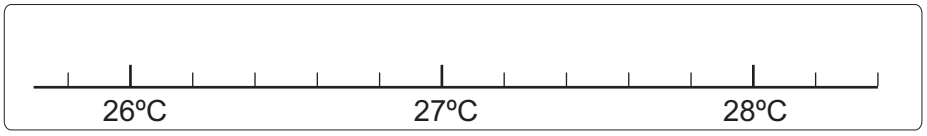
..... litres

(ii) 2·5 litres of water is emptied from the container shown above.

Clearly mark on the diagram below the height of the water left in the container. [1]



(b) A temperature is measured as 27·2°C.
Draw a pointer (↓) on the scale shown below to indicate this temperature. [1]



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4. The total number of points gained by a team playing in a hockey league is calculated as shown below.

$$\text{Points gained} = \text{games won} \times 3 + \text{games drawn} \times 1$$

(a) Oldborough Town have played 25 games.
They have won 13 games, lost 5 and have drawn the other games.
How many points have they gained? [3]

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(b) Aberfar Rovers play in the same hockey league.
They have gained 30 points and have drawn 9 of their games.
How many games did they win? [2]

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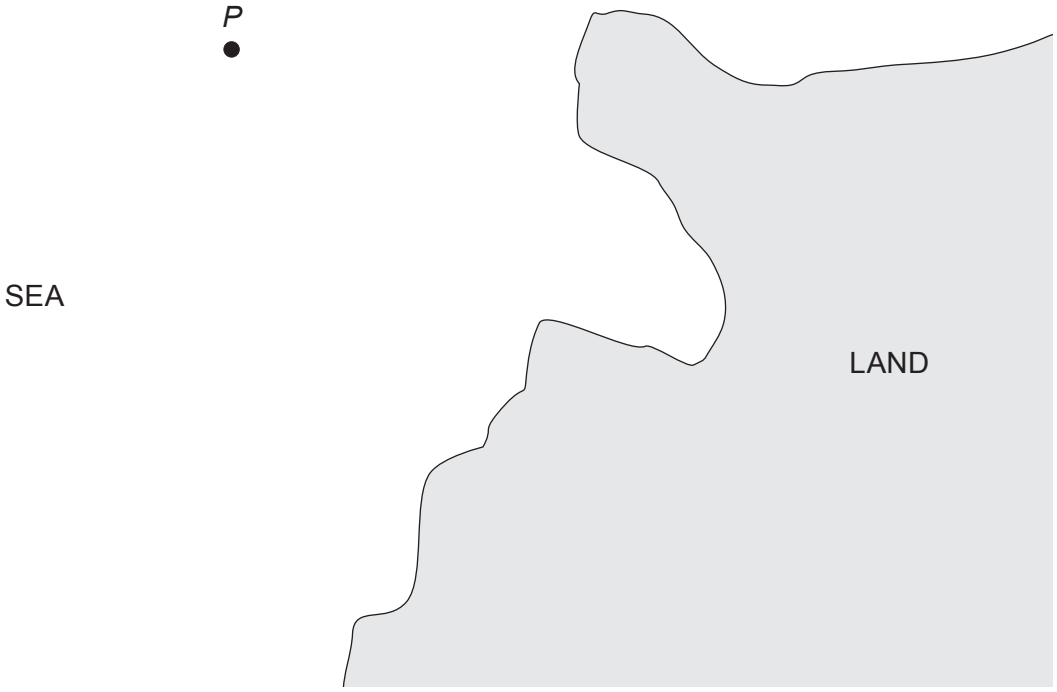
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5. A boat was out at sea at point *P*, as shown in the diagram below.

It sailed **in a straight line** for exactly 6 km before reaching the land.

Using a scale of **1 cm to represent 1 km**, mark with a cross (**X**), all the possible points on the shore where the boat could have landed. [3]



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6. *You will be assessed on the quality of your written communication in this question.*

Garry is arranging a birthday party for his grandmother at a local hotel.
Sixty people will be there, and half of them will be young children.

The hotel will provide food at a charge of £12 per portion.

To decide how many portions to order, Garry allows one portion of food for each adult and half a portion for each child.
To be sure there is enough food available; he then rounds up the total number of portions required to the nearest 10.

How many portions did Garry order and what was the total cost?
You must show all your working. [7]

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7. A shop sells pots of yoghurt at 74p each.
Anwen wants to buy as many pots as she can with a £5 note.

(a) How many pots of yoghurt can Anwen buy for £5? [2]

(b) Is it possible for the shopkeeper to give Anwen her change using a single coin? You must explain your answer. [2]

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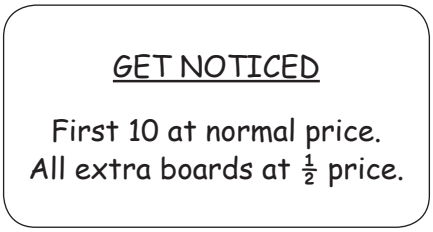
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8. A school wanted to buy a number of identical wooden noticeboards.
These noticeboards normally cost £8 each.

The school found two firms, *'Boards for All'* and *'Get Noticed'*, that sell these noticeboards.
Both firms had a special offer on the normal price.





(a) The school bought 17 noticeboards from *'Boards for All'*.
How much did they pay in total? [3]

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(b) Depending on the number of noticeboards that are required, show that it can be cheaper to buy them from *'Get Noticed'*. [3]

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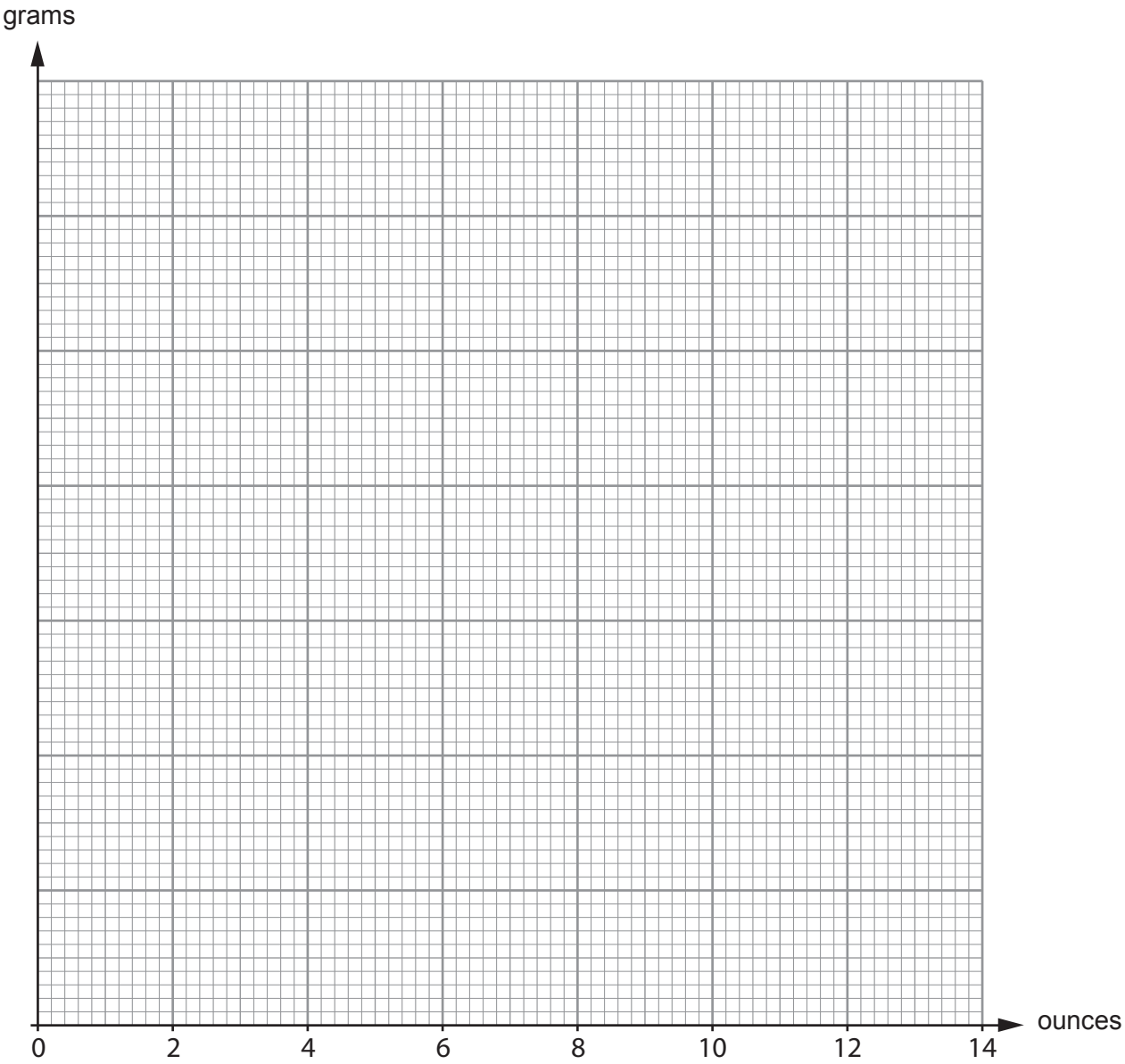
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9. The label on a small jar of jam shows the following information.

Approximate weight 340g (12oz)

(a) Use this information to draw a conversion graph between ounces (oz) and grams (g). [3]



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(b) 16 ounces (oz) = 1 pound (lb).

Using your graph, or otherwise, estimate the weight, **in kilograms**, of an object whose weight is 50lb.

You must show your working. [4]

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10. Azira is planning to paint the inside walls of her community centre.
A shop is selling the paint she wants in two different-sized tins.

- One tin of size A will cover an area of 24 m^2.
- One tin of size B will cover an area of 45 m^2.

Azira knows that 9 tins of size A will be just enough to paint all of the walls.

What is the least number of tins of size B that would be enough to paint all of the walls? [3]

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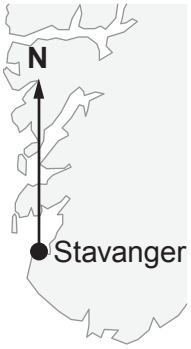
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11. The map shows a scale diagram of part of the North Sea coastline.

A ship is on a bearing of 035° from Aberdeen in Scotland and on a bearing of 290° from Stavanger in Norway.

By drawing suitable lines on the diagram below, find and mark the position of the ship. [3]





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12. 800 students from the UK and 300 students from Russia apply to attend a Summer Camp. 20% of the UK students and 30% of the Russian students are chosen to attend the camp.

What percentage of all the students who are chosen to attend the camp are from Russia? [5]

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13. A company's logo is displayed on the outside of its factory wall.
The shape of the logo is made using a rectangle, a right-angled triangle and a semicircle, as shown in the diagram below.
Some of the lengths are shown on the diagram.

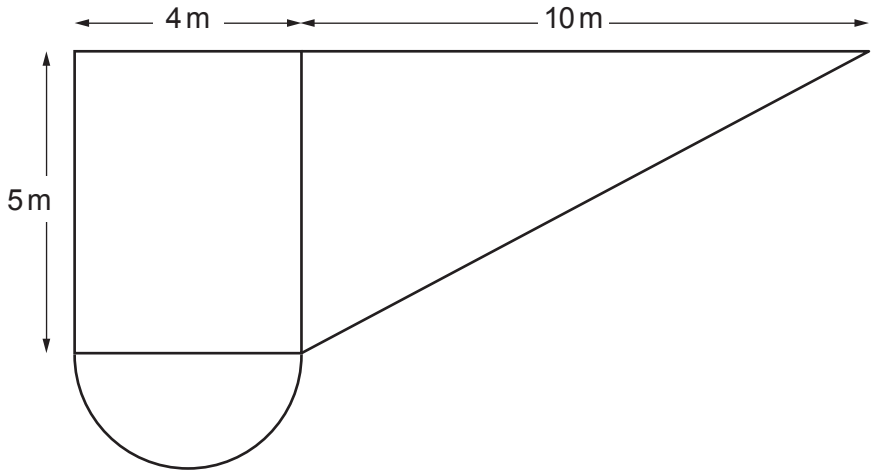


Diagram not drawn to scale

Calculate the total area of this logo. Give your answer correct to 1 decimal place. [5]

Examiner only

14. A flower shop takes delivery of a large tray of daffodils.

A label on the side of the tray states

- Total weight of daffodils: 8 kg correct to the nearest kilogram,
- Height of each daffodil: 20 cm correct to the nearest 10 cm.

Complete the table below to show the least and greatest total weight of the daffodils delivered, and the least and greatest height of the daffodils delivered. [4]

	Least Value	Greatest Value
Total weight of daffodils	..... kg	..... kg
Height of daffodils	..... cm	..... cm

END OF PAPER

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GCSE MARKING SCHEME

MATHEMATICS - UNITISED

JANUARY 2015

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INTRODUCTION

The marking schemes which follow were those used by WJEC for the January 2015 examination in GCSE MATHEMATICS - UNITISED. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

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Unit 1 - Higher Tier	4
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Unit 2 - Higher Tier	11
Unit 3 - Foundation Tier	14
Unit 3 - Higher Tier	18

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UNIT 1 - FOUNDATION TIER

January 2015 UNIT 1 Foundation	Mark	Final Mark Scheme Comments
1(a) 25068 (b) 4932 (c)(i) 31000 (ii) 1/2	B1 B1 B1 B1 4	Also allow F.T. 30000 – 'their 25068'.
2. (a) Comedy 18 Adventure 10 Science Fiction 9 Romantic 13 (b) Labelled bars of equal width for Comedy, Adventure, Science Fiction and Romantic. **AND** vertical axis labelled 'Frequency' (or equivalent) Uniform scale starting at 0. Four bars at correct heights.	B2 B1 B1 B2 6	For all four correct. B1 for two or three correct. Allow unambiguous indication in either 'Tally' or 'Frequency' column (Frequency column takes precedence). Labels may be indicated on the bars themselves or underneath the axis. Accept C, A, SF and R. Accept 'Number (of films)' as a label. B0 for ambiguous placing of numbers between grid lines. B1 for three correct heights. **F.T.** their frequencies. If no scale assume one square to represent a frequency of 1. Mark heights on uniform scale that does not start at 0 (e.g. starts at 1 or −1) accordingly.
3(a)(i) 7(litres) (ii) Height of water shown at 4·5 litres. (b) Indicates '1st notch to the right of 27'.	B1 B1 B1 3	 Allow any unambiguous indication between 4 and 5 litres (**not inclusive**) Allow unambiguous intent.
4(a) (Points gained =) $13 \times 3 + 7 \times 1$ $= 46$ (b) $\frac{30 - 9}{3}$ $= 7$ (games won)	M2 A1 M1 A1 5	M1 for $13 \times 3 + k \times 1$ $(k \neq 0)$ if seen. C.A.O.
5. 3 correct locations marked. (One per 'tolerance range')	B3 3	**Mark with overlay.** *Allow ±0·2cm in any direction.* B1 for each correct point. Penalise any incorrect 'extras' −1, once only If no marks gained, allow SC1for an arc, radius 6cm, centred at point P OR an arc of a different radius with 3 points marked

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January 2015 UNIT 1 Foundation	Mark	Final Mark Scheme Comments
6 Sight of 30 adults AND 30 children.	B1	May be implied.
(Portions ordered for the children =) 15	B1	F.T. 'their number of children'.
(Total number of portions required =) 45	B1	F.T. 'their number of adults' + 'their number of child portions'. No F.T. if 'number of child portion' = 30
(Total number of portions ordered =) 50	B1	F.T. rounding up to nearest 10 from 'their number of portions required'. B0 if already a multiple of 10. An unsupported answer of 50 implies all four B marks.
(Total cost =) (£) 600	B1	F.T. 'their number of portions ordered' × £12. *Note: Sight of (£)360 and (£)180 implies first three B1s. Sight of (£)540 as **final** answer implies B1B1B1B0B1.*
Look for • spelling • clarity of text explanations and correct units shown • the use of notation (watch for the use of '=', '+' and '–' being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	QWC 2 7	QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar. <u>An unsupported answer is QWC0.</u>
7(a) 500 / 74 OR 5 / 0·74	M1	Allow M1 for any attempt to find how many '74p in £5'. M0 for 5÷74 or 500÷0·74 unless rectified.
(She can buy) 6 (pots)	A1	Allow unambiguous embedded answer e.g. 6×74=444. 6·7(56...) implies M1.
(b) 6 × (£)0.74 OR 6 ×74(p) OR (£)4.44 OR 444(p) OR 56(p) OR (£)0.56	M1	F.T. 'their whole number of pots bought'.
NO because change is 56p (and there is no 56p coin)	A1 4	'NO' must be stated and the correct change for their number of pots shown or indicated. If number of pots >6 then only M1A0 possible.
8(a) Strategy of having 'four sets of 4 + 1 other'	S1	Allow any indication of attempt at correct strategy.
(£)24 + (£)24 + (£)24+ (£)24 + (£)8 or equivalent.	M1	Accept any unambiguous intention.
= (£)104	A1	
(b) Trialling <u>both</u> offers for an <u>equal</u> number of boards.	M1	A correct method must be attempted for '*Get Noticed'*.
A correct value for the cost of their stated number of boards at '*Get Noticed'* .	A1	(if ordering 17 boards this is £108 and gains M1A1.) SC1 for a correct cost for '*Get Noticed'* for a number of boards not considered for *'Boards for All'*.
<u>Correct</u> costs for <u>both</u> offers for an <u>equal</u> number of boards that show the cost at '*Get Noticed'* is lower than the cost at *'Boards for All'*.	A1 6	(This will require 19 or 21 or more boards to be costed.)

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January 2015 UNIT 1 Foundation	Mark	Final Mark Scheme Comments
9 (a) Uniform scale on vertical axis. Plotting (12,340). Correct line drawn from (0,0) to (12,340±5) (b) (50 lb =) 800 (oz) Any correct strategy, e.g. 100 times their value at 8oz. OR $\frac{340}{12} \times 800$ A correct answer <u>for their line</u> OR 22666(·6..) (gm) = 22·667 (kg)	B1 P1 L1 B1 M1 A1 B1 7	*P0, L0 if no <u>attempt</u> at uniform scaling.* ± '½ a small square'. Allow P1 if attempt made at uniform scaling. Allow line starting at (2,57±1). Correct line implies P1L1. B0 for incorrect units e.g. 800 lb or 800 kg. F.T. 'their graph' and also F.T. 'their 800oz'. If using their graph allow ± '½ a small square' in reading of grams at 8oz. F.T. 'their answer in grams' / 1000 Accept unsupported answers between 22·5 and 22·8. Similarly with F.T. answers. *<u>Alternative method</u>:* *1kg ≈ 2·2lb B1* *50 ÷ 2·2 M1* *= 22·7(...) ISW A2*
10. 9 × 24 (= 216) $\frac{9 \times 24}{45}$ 5 (tins)	M1 M1 A1 3	C.A.O. M1,M1,A0 for an answer of 4·8. Allow <u>unambiguous</u> embedded <u>final</u> answer e.g. 5 × 45 = 225(m^2) for all three marks.
11. Position at 035° from Aberdeen. Position at 290° from Stavanger. Position marked OR two intersecting lines.	 M1 M1 A1 3	± 2° (use overlay). Allow the M marks for dots, crosses or any unambiguous indication that the correct bearings have been offered. F.T. if at least M1 and two intersecting lines. (Lines must originate from Aberdeen and Stavanger respectively)
12. 0·2 × 800 OR 0·3 × 300 = 160 = 90 $\frac{90}{250} \times 100$ = 36(%)	M1 A1 A1 M1 A1 5	F.T. 'their 90' and 'their 160 + 90'. Do not F.T. 300 / 1100.
13. 5 × 4 (+) $\frac{10 \times 5}{2}$ (+) $\frac{\pi \times 2^2}{2}$ = 20 (+) 25 (+) 6·28(...) = 51·3(m^2)	M2 A2 A1 5	M1 for one or two correct. A1 for 20 AND 25, A1 for 6·28(...) or 6·3 F.T. provided M1A1 gained and three values added with an answer given to 1 d.p.
14. Least Value Greatest Value 7·5 8·5 15 25	 B4 4	B1 for each correct entry. Accept 8·49 recurring but not 8·49. Accept 24·9 recurring but not 24·9.

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UNIT 1 - HIGHER TIER

January 2015 UNIT 1 Higher	Mark	Final Mark Scheme Comments
1. (Fuel cost =) $\frac{160}{40} \times$ (£)6.24	M1	
= (£)24.96	A1	SC1 for (£)12.48
(Total cost of travel =) (£)48.71 or (£)49	B1	F.T. 'their £24.96 '+ £23.75.
(Cost of computer in pounds =) $\frac{1500}{1{\cdot}18}$	M1	
= (£)1271.18(...) or (£)1271.19 or (£)1271	A1	
(Total spent =) (£)1319.89(...) or (£)1319.90 or (£)1320	B1	F.T. 'their derived £48.71' + 'their derived £1271.18'
(Amount saved to the nearest £ =) (£)330	B1	F.T. £1650 – 'their £1319.89(...)'. B0 if not given to the nearest pound. *Alternative method* *M1A1B1 then (Total in euros)=48.71×1·18 +1500* *M1* *= 1557.48* *A1* *(Total in £) =(1557.48 ÷ 1·18 =) (£)1319.20* *B1* *(Amount saved to the nearest £ =) (£)330* *B1*
Look for • spelling • clarity of text explanations and correct units shown • the use of notation (watch for the use of '=', '+' and '–' being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	QWC 2 9	QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar.
2. Position at 035° from Aberdeen. Position at 290° from Stavanger. Position marked OR two intersecting lines.	 M1 M1 A1 3	± 2° (use overlay). Allow the M marks for dots, crosses or any unambiguous indication that the correct bearings have been offered. F.T. if at least M1 and two intersecting lines. (Lines must originate from Aberdeen and Stavanger respectively)
3. 0·2 × 800 OR 0·3 × 300	M1	
= 160	A1	
= 90	A1	
$\frac{90}{250} \times 100$	M1	F.T. 'their 90' and 'their 160 + 90'. Do not F.T. 300 / 1100.
= 36(%)	A1 5	

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January 2015 UNIT 1 Higher	Mark	Final Mark Scheme Comments
4. Points / No. Games (0) 12 (1) 6 (2) 30 (3) 24 Attempt at $\sum f \times x$ (138) Division by $\sum f$ (72) (Mean =) 1·9 (points) ISW	B2 M1 m1 A1 5	B2 for all four correct. B1 for 2 or 3 correct. If no marks gained allow B1 for indicating that 1 game is equivalent to 5°. F.T. their completed table. *Or 690 (M1) ÷ 360 (m1)* C.A.O. for 'their table'.
5(a) 3·71 (b) $4^4/_5$	B2 B1 3	B1 for 3·7(05.....) Accept equivalent such as $4^{48}/_{60}$. B0 for 4·8.
6. $5440 \times (7/8)^2$ or equivalent = 4165	M2 A1 3	M1 for 5440 × (7/8) or equivalent. M1, A1 for sight of 4760. Treat increase as a mis-read.
7(a) (i) A statement that indicates that the company started to make a profit. (ii) A statement that indicates that the profit made by the company has 'levelled out'. (iii) A statement that indicates that the company was losing money. (b) $\frac{1220 + 0{\cdot}18 \times 650 + 247}{2{\cdot}75}$ = 576	B1 B1 B1 M1 A1 5	 Accept any equivalent statement that shows an understanding of the nature of the curve drawn from year 4 onwards. Allow use of the word 'profit' in e.g. 'the profits are getting less' or 'the profits are plummeting'. M1 awarded at this stage.
8 $10 \times \frac{150}{100} \times \frac{3}{5}$ = 9 (hours)	M1 M1 A1 3	M2 for the correct use of the '10' with all four of the numbers 150, 100, 3 and 5. M1 for the correct use of the '10' with any two of the numbers 150, 100, 3 and 5. C.A.O.
9. 108% ≡ 69·93 (Previous best throw) $\frac{69{\cdot}93}{108} \times 100$ = 64·75 (m)	B1 M1 A1 3	Accept any indication. Or equivalent.

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January 2015 UNIT 1 Higher	Mark	Final Mark Scheme Comments
10. Sight of 345(cm) Sight of 20·5(cm) Use of $\frac{345}{20{\cdot}5}$ (× 4) = 67·3(17....) (Least number required =) 68	B1 B1 M1 A2 A1 6	F.T. 'their least base length' if < 350, and 'their greatest strip length' if > 20. A1 if '×4' not calculated (16·8…) F.T. rounding up if of equivalent difficulty. *Note:Allow B0,B1,M1,A2,A1 for* *1395 ÷ 20·5 B0,B1,M1* *=68(·04..) A2* *69 (strips) A1* *If no marks gained,* *SC2 for an answer of 73* *OR SC1 for sight of 355(cm) AND 19·5 (cm)*
11. Correct use of Distance = Speed × Time 75 (miles) AND 210 (miles) AND 15 (miles) Correct use of 'Fuel used' = Distance ÷ 'mpg' 1·5625 (gal) AND 5 (gal) AND 0·375 (gal) 7 (gallons)	M1 A1 M1 A1 A1 5	One correct implies first M1. F.T. 'their distances'. One correct implies second M1. Allow 1·6 and 0·4. F.T. 'their values' only if all three found using 'dist / mpg'. Must be to the nearest gallon. A correct answer gains the previous A1.
12(a) Sight of $\frac{\theta}{360} \times \pi \times 10^2$ OR $\frac{\theta}{360} \times \pi \times 6^2$ $\frac{\theta}{360} \times \pi \times 10^2 - \frac{\theta}{360} \times \pi \times 6^2 = 48{\cdot}03$ $\theta = \frac{48{\cdot}03 \times 360}{64\pi}$ $= 86^{(\circ)}$ (b) Sight of $\frac{86}{360} \times 2\pi \times 10$ OR $\frac{86}{360} \times 2\pi \times 6$ = 15 OR = 9 (PQSR =) 15 + 9 + 4 + 4 = 32(cm)	B1 M1 m1 A1 M1 A1 M1 A1 8	Or equivalent. SC1 for $55^{(\circ)}$ OR SC1 for $152{\cdot}8\ldots^{(\circ)}$ or $153^{(\circ)}$ (as well as a possible B1) F.T. 'their 86°'. Accept 15 to 15·02 inclusive. Accept 9 to 9·01 inclusive. F.T. 'their evaluated arc lengths' only if 86/360 and π used. C.A.O. for 'their 86°'.
13. (a) Sight of $\pi \times 15^2 \times 30$ OR $\frac{2}{3} \times \pi \times 15^3$ OR $\frac{4}{3} \times \pi \times 15^3$ $\pi \times 15^2 \times 30 - 2 \times \frac{2}{3} \times \pi \times 15^3$ = 7068(·....)(cm^3) or 2250π (b) Sight of $\frac{1}{3} \times \pi \times (0{\cdot}4x)^2 \times 0{\cdot}9x$ $x^3 - \frac{1}{3} \times \pi \times (0{\cdot}4x)^2 \times 0{\cdot}9x = 849{\cdot}2$ $x^3 = 1000$ or equivalent x = 10(cm)	B1 M1 A1 B1 M1 A1 A1 7	(Look for 21205·... – 14137·....) Accept answers between 7065 and 7071·5 inclusive. B0 if M1 awarded for use of $0{\cdot}4x^2$ Only F.T. allowed is use of $0{\cdot}4x^2$ instead of $(0{\cdot}4x)^2$. F.T. their x^3 value.

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4351/01

A14-4351-01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: Mathematics In Everyday Life

FOUNDATION TIER

A.M. WEDNESDAY, 5 November 2014

1 hour 15 minutes

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**4**	
2.	**4**	
3.	**3**	
4.	**4**	
5.	**9**	
6.	**2**	
7.	**5**	
8.	**6**	
9.	**5**	
10.	**3**	
11.	**5**	
12.	**2**	
13.	**3**	
14.	**6**	
15.	**4**	
Total	**65**	

4351 010001

ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **5**.

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1. The mean temperature at the summit of Snowdon was recorded for each month from November to March.
The results are summarised below.

Month	November	December	January	February	March
Mean Temperature (°C)	3	–5	–8	–2	7

(a) List the **months** in order, starting with the month with the lowest mean temperature, up to the month with the highest mean temperature. [1]

Lowest *Highest*

Month: ....

(b) How many of these months had a mean temperature below 0°C? [1]

.....

(c) What was the difference in temperature between the lowest and highest mean temperatures given in the table? [1]

.....

(d) In November, the mean temperature at the summit of Ben Nevis was 5°C lower than the mean temperature at the summit of Snowdon.
What was the mean temperature at the summit of Ben Nevis in November? [1]

.....

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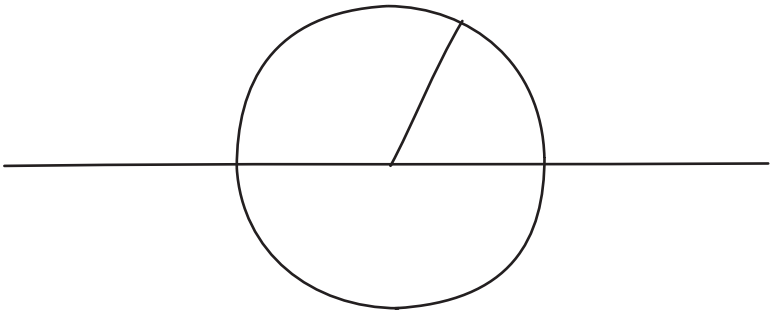
2. An advertising studio is given the following instructions from a client.

Instructions

We would like our company logo to be as follows:

- A straight horizontal line of length 11 cm.
- A circle of radius 4 cm, with its centre at the midpoint of the horizontal line.
- A straight line drawn inside the circle, at 70° to the horizontal line, as shown in the sketch below.

Sketch



Make an **accurate** drawing of the logo required in the space below. [4]

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3. A band hired a concert hall for two nights.
They would only hire the hall for a third night if at least 0·9 of the tickets were sold for either of the first two nights.

On the first night, 82% of the tickets were sold.

On the second night, $\frac{3}{4}$ of the tickets were sold.

Did the band hire the concert hall for a third night?
You must **show all your working**, explaining clearly how you decided. [3]

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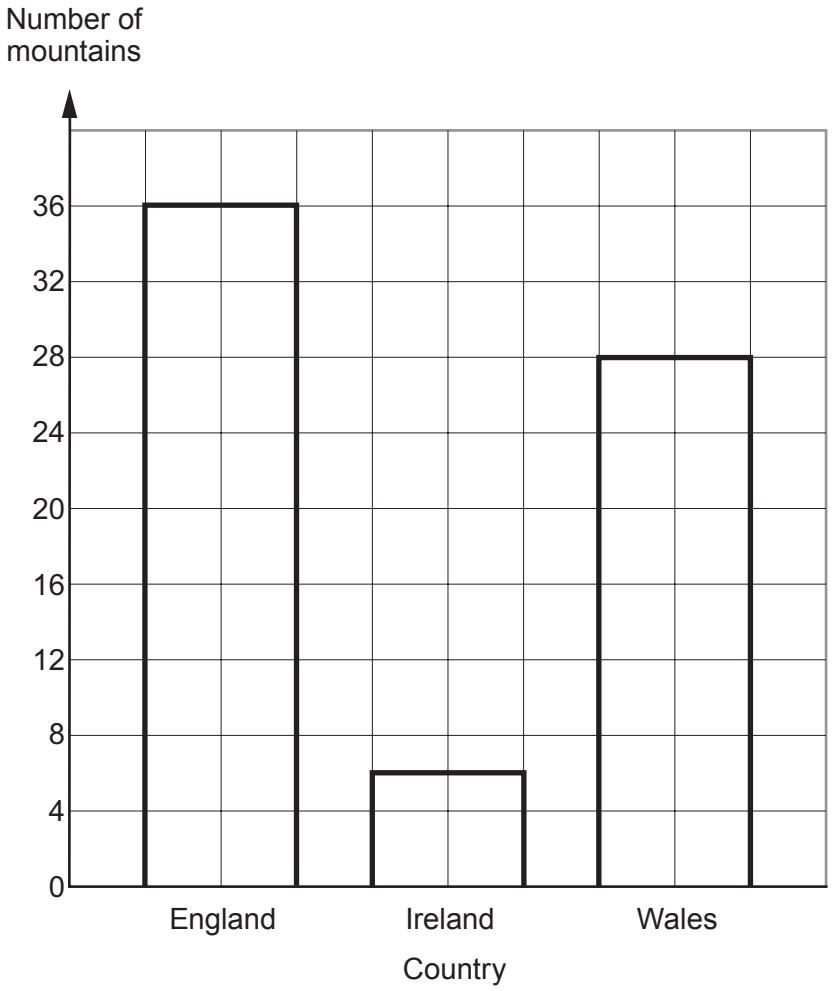
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4. The bar chart shown below was drawn using information found on an internet web page. It shows the number of mountains in each of the three countries of England, Ireland and Wales, whose heights are in the range 800 metres to 1000 metres.



(a) How many mountains are there in Wales whose heights are in the range 800 m to 1000 m? [1]

.....

(b) How many mountains are there altogether in the three countries whose heights are in the range 800 m to 1000 m? [1]

.....

.....

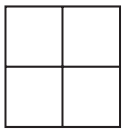
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(c) There are 280 mountains in Scotland whose heights are in the range 800 m to 1000 m.

In the box below, draw a pictogram which compares the data for Scotland with the **total for the other three countries**.

Use  to represent 40 mountains. [2]

Scotland	
Total for England, Ireland and Wales	

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5. *You will be assessed on the quality of your written communication in this question.*

Two years ago, a local council began renting out garden allotments.
The council owned 60 allotments of equal size.
The rent charged for each allotment was £150 per year.

In the first year, three-quarters of the allotments were rented.
In the second year, 80% of the allotments were rented.

Calculate the total amount of money the council collected in rent over these two years.
You must show all your working. [9]

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6. Brother and sister, Nigel and Rhian, have been taking part in a swimming festival.

Rhian tells her mother, “I won three times as many medals as Nigel”.
Nigel tells his mother, “Rhian won four more medals than me”.

Both were telling the truth.
How many medals did each of them win? [2]

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Nigel won ..... Rhian won .....

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Turn over.

Examiner only

7. Three neighbours hired a cement mixer.
The cost of hiring the mixer is given by the following formula.

total cost = £30 per day + insurance

(a) They hired the mixer for four days at a total cost of £144.
How much did they pay for the insurance? [2]

(b) One of the neighbours said that he would pay $\frac{2}{3}$ of the total cost, as he would be using the mixer the most. The other two neighbours shared the remaining cost equally.

How much did each of these two neighbours pay? [3]

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8. An open rectangular water tank has dimensions as shown below.

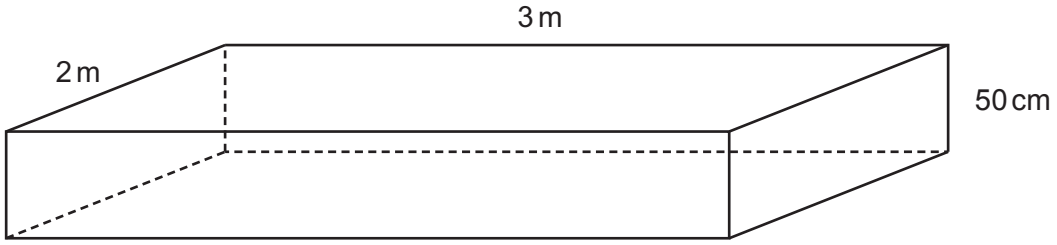


Diagram not drawn to scale

(a) What is the volume of water in the tank when it is completely filled?
Give your answer in cubic metres (m^3). [3]

(b) A special material is used to treat all the joins between any two sides and also between each side and the base of the tank.
This material costs £4 per metre.
Calculate the cost of using this material on this tank. [3]

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9. Sally went on a trip to South Africa.

(a) Before departing, she exchanged £480 into rand.
The exchange rate was £1 = 13·25 rand.
How many rand did Sally receive? [2]

(b) Before departing, she also paid £52 for a safari tour in South Africa.
This tour would have cost her 795 rand if she had paid for it on the day of the tour.
Using the same exchange rate, calculate the difference **in pounds** between these two prices. [3]

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10. A cycle club organised a race that takes place over a fortnight.
In the race, the competitors travelled a distance of 320 miles in England and 480 kilometres in France.
In which country did the race cover the most distance?
What was the difference between these distances? [3]

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Country in which most distance was covered was .....

Difference in the distance covered was .....

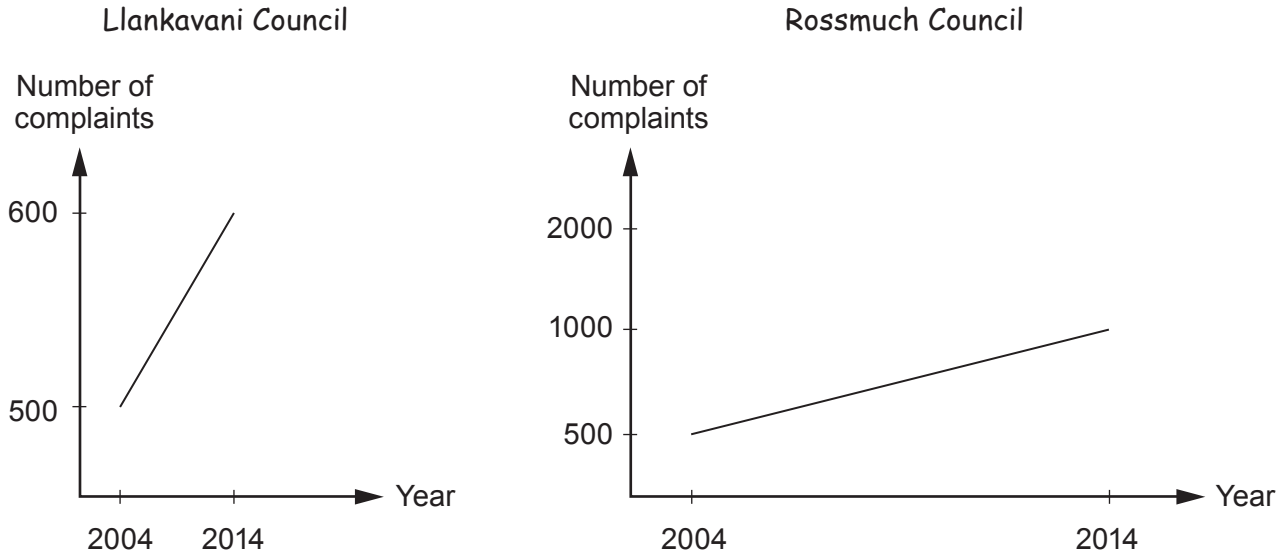
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11. The district councils for Llankavani and Rossmuch have both been considering the number of complaints received from residents over a ten-year period.
The graphs shown below were published in a local newspaper under the following headline.

How satisfied are you with your Council?



(a) Looking only at the two graph lines drawn, how could someone mistakenly think that there has been a greater increase in complaints to the Llankavani council than to the Rossmuch council? [1]

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(b) Give **one** reason why these graphs cannot be easily compared. [1]

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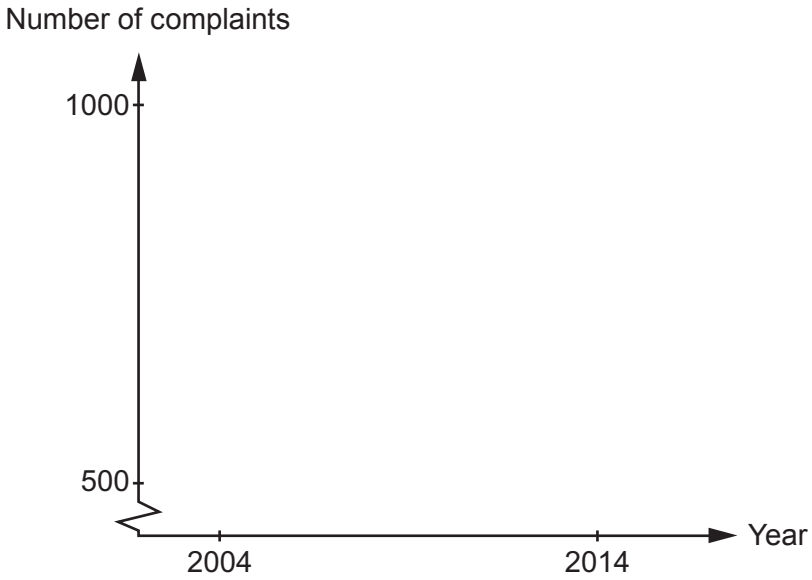
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(c) On the diagram below, use a suitable uniform scale on the vertical axis and draw two lines that will show the information for Llankavani and Rossmuch.
Label each line with the name of the council it represents. [3]



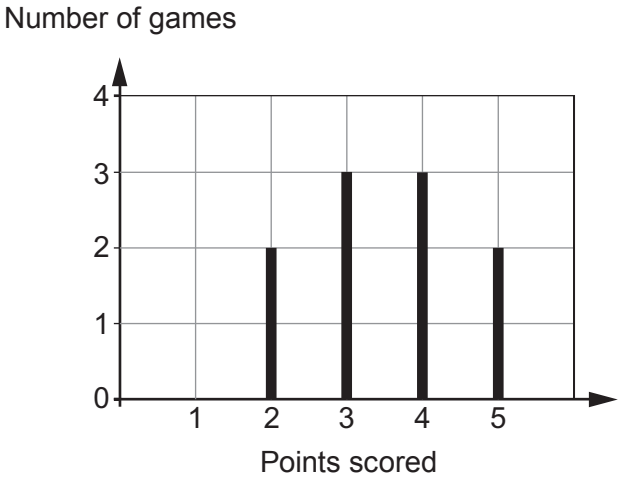
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12. Catrin and Samir each played a game ten times.
In each game, between one and five points were scored.

Catrin had a mean score of 2·7 points for her ten games.
The range of the number of points she scored on her games was 4.

Samir recorded his scores as shown on the grid below.



(a) Who had the bigger mean score?
You **must** give a reason for your answer. [1]

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(b) Who had the bigger range of the number of points scored?
You **must** give a reason for your answer. [1]

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13. In a Park and Ride scheme, people leave their cars on the outskirts of a town and travel into town by bus.
A survey was carried out to decide if a town should start a Park and Ride scheme.

Shoppers in the town were asked the following four questions.

Q1. Did you travel into town by car?

YES ☐ *NO* ☐

Q2. What type of car do you have?

.....

Q3. Was it easy to find a place in town to park your car?

YES ☐ *NO* ☐

Q4. How many times would you use a Park and Ride, if available?

1-5 times ☐ *6-10 times* ☐ *more than 10 times* ☐ *less than 20 times* ☐

(a) Which one of the first **three** questions would you remove?
You must give a reason. [1]

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(b) Give **two** reasons why question 4 is not suitable. [2]

Reason 1 .....

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Reason 2 .....

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14. The grid below can be used to find the distances, in miles, between four schools labelled A, B, C and D.

	A	**B**	**C**	**D**
A		9	7	4
B	9		12	6
C	7	12		5
D	4	6	5	

For example, the distance between school D and school B is 6 miles.

	A	B	C	D
A		9	7	4
B	9		12	6
C	7	12		5
D	4	(6)	5	

Mr Morgan, from school A, was required to visit all the other three schools and then return to school A.
He went from A to B, then from B to C, then from C to D before returning from D to A. This was a total of 30 miles.

(a) Mr Morgan took 1 hour and 30 minutes to travel this distance of 30 miles in his car. Calculate his average speed, in miles per hour. [3]

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(b) Find **two** other **different** routes Mr Morgan could have taken, starting and finishing at school A.
You must calculate the total distance covered in each case. [3]

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15. Eleri invests £3700 for 3 years at 2% per annum compound interest.
Calculate the value of her investment at the end of the 3 years.
Give your answer correct to the nearest penny. [4]

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END OF PAPER

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GCSE MARKING SCHEME

MATHEMATICS - UNITISED

NOVEMBER 2014

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INTRODUCTION

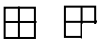
The marking schemes which follow were those used by WJEC for the November 2014 examination in GCSE MATHEMATICS - UNITISED. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

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UNIT 1 - FOUNDATION TIER

GCSE Mathematics - Unitised Unit 1 Foundation Tier November 2014	Mark	Final Mark Scheme Comments
1(a) January December February November March (b) 3 (c) 15(°C) (d) - 2(°C)	B1 B1 B1 B1 4	Accept any unambiguous indication of correct order including - 8, - 5, - 2, 3, 7. Do not accept a list of months. Allow - 15(°C)
2. Horizontal line 11cm long. Circle with radius 4cm. Midpoint unambiguously identified. Line drawn at an angle of 70° as per sketch.	 B1 B1 B1 B1 4	*Allow lengths to be ° 2mm and angle ° 2°.* Accept intent to be horizontal. Do not accept 'free hand' drawing. F.T. their line length. If <u>all</u> four marks gained but logo not as intended (e.g. centre of circle not at identified midpoint), penalise −1.
3. Finding (0·9) 0·82 and 0·75 OR 90% (82%) and 75% OR 90/100 82/100 and 75/100 or equivalent. OR three correct calculations for a common amount. AND stating 'NO'.	B3 3	All correct decimals, OR all correct %, OR all correct fractions <u>with common denominator</u>, OR correct work using a common amount for sales made, OR a valid combination AND stating 'NO'. (The 'NO' must follow from a correct reason). B2 for the above BUT with 'NO' not stated or stated for an incorrect reason. B1 for having only two correct values that may be compared (with or without a statement). Ignore subsequent working if marks gained.
4(a) 28 (b) 70 (c) Scotland  England Ireland and Wales  or equivalent.	B1 B1 B1 B1 4	 7 symbols. Ignore poor drawings. 1 full symbol plus ¾ of the symbol. F.T. their answer to (b), provided it is of equal difficulty, correct to the nearest 10. Penalise contiguous or disjointed symbol −1, once only.

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GCSE Mathematics - Unitised Unit 1 Foundation Tier November 2014	Mark	Final Mark Scheme Comments
5. (Rented out first year =) ¾ × 60 = 45 (Rent collected first year 45 × (£)150 =) (£)6750 (Rented out second year =) 0·8 × 60 = 48 (Rent collected second year = 48 × 150 =) (£)7200 (Total collected over the two years =) (£)13950	M1 A1 A1 M1 A1 A1 B1	F.T. their number of allotments. F.T. 'their 48' × £150. Number of allotments rented must be different to number for first year. F.T. their two amounts. *Alternative Methods* *OR* *60 × (£)150 M1 ¾ × 60 M1* *= (£)9000 A1 = 45 A1* *¾ × (£)9000 M1 0·8 × 60 M1* *= (£)6750 A1 = 48 A1* *0·8 × (£)9000 M1 (45+48 =) 93 B1* *= (£)7200 A1 93 × (£)150 M1* *(Total =) (£)13950 B1 (Total =) (£)13950 A1*
Look for ¶ spelling ¶ clarity of text explanations, ¶ the use of notation (watch for the use of '=', '£' and '×' being appropriate) QWC2: Candidates will be expected to ¶ present work clearly, with words explaining process or steps AND ¶ make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to ¶ present work clearly, with words explaining process or steps OR ¶ make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	QWC2 9	QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar.
6. Nigel 2 Rhian 6	B2 2	Must be whole numbers. SC1 if reversed. B1 for 'their score for Rhian' = 'their score for Nigel' + 4. B1 for 'their score for Rhian' = 'their score for Nigel' × 3.
7(a) (Insurance =) (£)144 - (£)30 × 4 = (£)24 (b) (⅔ × £144 =) (£)96 (Each paid) $\frac{(£)144 - (£)96}{2}$ = (£)24	M1 A1 B1 M1 A1 5	Allow embedded answers. For sight of (£)96. F.T. 'their £96'. *Alternative Methods 7(b)* *(⅓ × £144 =) (£)48 OR Sight of $^1/_6$ B1* *(£)48 · 2 OR $^1/_6$ × 144 M1* *= (£)24 A1*

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GCSE Mathematics - Unitised Unit 1 Foundation Tier November 2014	Mark	Final Mark Scheme Comments
8(a) Use of Volume = length × width × height. (Volume =) $3 \times 2 \times 0{\cdot}5$ $= 3(m^3)$ (b) (Total length =) $3 + 2 + 3 + 2 + 4 \times 0{\cdot}5$ $= 12(m)$ (Cost =) (£)48	M1 m1 A1 M1 A1 A1 6	Allow $3 \times 2 \times 50$ Also accept $300 \times 200 \times 50$. C.A.O. For attempt to add at least 5 lengths. C.A.O. F.T. 4 × 'their total length'.
9(a) $480 \times 13{\cdot}25$ = 6360 (rand) (b) $795 \cdot 13{\cdot}25$ = (£)60 (A difference of) (£)8	M1 A1 M1 A1 A1 5	 F.T. 'their (£)60' – (£)8. *Alternative method.* *795 - (52 × 13·25) M1 (106 rand gains M1)* *· 13·25 m1* *= (£)8 A1*
10. $320 \times 1{\cdot}6$ OR $480 \times 0{\cdot}625$ = 512 (km) OR = 300 (miles) (Difference =) 32km OR 20 miles AND 'England'	M1 A1 A1 3	Or equivalent e.g. $320 \times 8/5$ OR $480 \times 5/8$. F.T. their calculation if M1 awarded. Correct units must be given and England identified as the country in which most distance was covered.
11. (a) A comment that refers to the fact that the gradient of the 'Llankavani line' appears to be greater than that of the 'Rossmuch line'. (b) Some reference made to the different scales used on either the vertical or the horizontal axis. (c) Uniform vertical scale of 1cm ≡ 100 complaints. Line from (2004, 500) to (2014, 600) AND labelled 'Llankavani'. Line from (2004, 500) to (2014, 1000) AND labelled 'Rossmuch'.	E1 E1 B1 L1 L1 5	 A reference to 'gradient (steeper)' gains E1. A reference to '(different) scale' gains E1. Allow these marks whether given in (a) or (b). *Allow ° 2mm.* *Allow 'notches' with no values written.* *Allow intent for both L1 marks.* *Penalise −1 if <u>both</u> lines start from (2004,0) or <u>both</u> lines start from (year,500) year ≠ 2004.* *Penalise −1, once only, if lines continue significantly beyond 2014.* *B0, (possible)L1, L1 if no scale shown.* SC1 if <u>both</u> lines 'correct' but not labelled or incorrectly labelled.

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GCSE Mathematics - Unitised Unit 1 Foundation Tier November 2014	Mark	Final Mark Scheme Comments
12.(a) Samir AND a valid reason given.	B1	e.g. 'Most of his points were 3 or over', 'Samir had a mean of 3·5'. B0 if an incorrect mean given for Samir.
(b) Catrin AND a valid reason given.	B1	e.g. 'Samir's range was (only) 3' also allow 'Samir's range was 2 to 5 (or 5 to 2)'. B0 if an incorrect range given for Samir.
	2	
13 (a) Question 2 because it is not relevant.	B1	Allow e.g. 'not valid' for 'not relevant'. Do not credit 'too personal'. Q2 with no reason, or an incorrect reason, is B0.
(b) Two valid reasons given. E.g. "No box for 'Never'". "'More than 10' and 'less than 20' are not exclusive". "Less than 20 overlaps all the other three answers". "Over what period of time?"	B2	B1 for each different reason (maximum of 2 marks). Ignore extra incorrect statements such as, '2nd and 3rd boxes overlap' or 'last box should be more than twenty' if marks have been awarded for correct reasons.
	3	
14(a) Use of 'Distance' / 'Time' (Average speed =) 30 / 1·5 = 20 (mph)	M1 m1 A1	Allow 1(h)30(m) or 1·3 or 90(min) etc. for this M1. C.A.O.
(b) Correct strategy.	S1	Shows understanding of table values with at least two distances correctly noted.
Two different routes shown AND a correct distance given in each case.	B2	B1 for each. A-B- D-C-A = 27(miles) A-C- B-D-A = 29(miles) A-C- D-B-A = 27(miles) A-D- B-C-A = 29(miles) A-D- C-B-A = 30(miles)
	6	
15. 3700 74 3774 75.48 3849.48 76.98(96) 3926.46(96) (£) 3926.47 OR 392647(p)	B1 M1 A1 A1	For the evaluation of a correct 2% OR Sight of 1·02 (222 and 3922 imply use of 3× 74 and gain B1) For attempting to find 3 different 2%. OR $3700 \times 1{\cdot}02^3$. Or sight of (£)74 AND (£)75.48 AND (£)76.98(..) F.T. one error. Accept £3926.47p. Do not accept 3926.47p. Mark final value of investment (i.e. do not penalise if they continue to give £226.47)
	4	

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UNIT 1 - HIGHER TIER

GCSE Mathematics - Unitised Unit 1 Higher Tier November 2014	Mark	Final Mark Scheme Comments
1. (a) Question 2 because it is not relevant.	B1	Allow e.g. 'not valid' for 'not relevant'. Do not credit 'too personal'. Q2 with no reason, or an incorrect reason, is B0.
(b) Two valid reasons given. E.g. "No box for 'Never'". "'More than 10' and 'less than 20' are not exclusive". "Less than 20 overlaps all the other three answers". "Over what period of time?"	B2 3	B1 for each different reason (maximum of 2 marks). Ignore extra incorrect statements such as, '2nd and 3rd boxes overlap' or 'last box should be more than twenty' if marks have been awarded for correct reasons.
2 (a) A comment that refers to the fact that the gradient of the 'Llankavani line' appears to be greater than that of the 'Rossmuch line'.	E1	A reference to 'gradient (steeper)' gains E1. A reference to '(different) scale' gains E1. Allow these marks whether given in (a) or (b).
(b) Some reference made to the different scales used on either the vertical or the horizontal axis.	E1	
(c) Uniform vertical scale of 1cm ≡ 100 complaints.	B1	Allow ° 2mm. Allow 'notches' with no values written. Allow intent for both L1 marks.
Line from (2004, 500) to (2014, 600) AND labelled 'Llankavani'.	L1	Penalise −1 if <u>both</u> lines start from (2004,0) or <u>both</u> lines start from (year,500) year ≠ 2004.
Line from (2004, 500) to (2014, 1000) AND labelled 'Rossmuch'.	L1 5	Penalise −1, once only, if lines continue significantly beyond 2014. B0, (possible)L1, L1 if no scale shown. SC1 if <u>both</u> lines 'correct' but not labelled or incorrectly labelled.
3 (a) Samir AND a valid reason given.	B1	e.g. 'Most of his points were 3 or over', 'Samir had a mean of 3·5'. B0 if an incorrect mean given for Samir.
(b) Catrin AND a valid reason given.	B1 2	e.g. 'Samir's range was (only) 3' also allow 'Samir's range was 2 to 5 (or 5 to 2)'. B0 if an incorrect range given for Samir.
4. (Cost =) (£)27.50 × 1·2 or equivalent. = (£)33 (Change =) (£)7	M1 A1 A1 3	 FT 40 – 'their 33' If no marks, SC1 for sight of (£)18.

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GCSE Mathematics - Unitised Unit 1 Higher Tier November 2014	Mark	Final Mark Scheme Comments
5. (Increase in population between 2001 and 2011 =) (14500 - 12500 =) 2000 (% increase ≈) $\frac{2000}{12500} \times 100$ or equivalent. = 16(%) Working with appropriate approximations in calculation of the percentage. Look for ¶ spelling ¶ clarity of text explanations (presented as a clear report) ¶ the use of notation (watch for the use of '=' and % being appropriate) QWC2: Candidates will be expected to ¶ present work clearly, with words explaining process or steps AND ¶ make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to ¶ present work clearly, with words explaining process or steps OR ¶ make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	B1 M1 A1 B1 QWC2 <

GCSE Mathematics - Unitised Unit 1 Higher Tier November 2014	Mark	Final Mark Scheme Comments
7(a) Use of 'Distance' / 'Time' (Average speed =) 30 / 1·5 = 20 (mph) (b) Correct strategy. Two different routes shown AND a correct distance given in each case.	M1 m1 A1 S1 B2 6	Allow 1(h)30(m) or 1·3 or 90(min) etc. for this M1. C.A.O. Shows understanding of table values with at least two distances correctly noted. B1 for each. A-B- D-C-A = 27(miles) A-C- B-D-A = 29(miles) A-C- D-B-A = 27(miles) A-D- B-C-A = 29(miles) A-D- C-B-A = 30(miles)
8. Sight of either $\pi \times 5^2$ OR $\frac{1}{2} \times 8 \times 6$ (Area =) $\pi \times 5^2 - \frac{1}{2} \times 8 \times 6$ = 54·5(...) m^2	B1 M1 A1 U1 4	$\pi \times 5^2$ must be for area of circle not semicircle. Allow B1 for $(\pi \times 5^2)/2$ if clearly area of semicircle. Look out for M0 for $\pi \times 5^2 - (6 + 8 + 10)$. Accept 54·5 to 54·6 inclusive. Correct units for final answer. Independent of all other marks.
9(a) $20^2 = 4^2 + 2 \times a \times 64$ $\frac{20^2 - 4^2}{2 \times 64}$ (= a) = 3(ms^{-2}) (b) (v^2 =) $4^2 + 2 \times 3 \times 100$ (= 616) (v =) 24·8(...)(ms^{-1}) (so velocity of 25ms^{-1} not reached)	B1 B1 B1 M1 A1 5	For correct substitution. F.T. their acceleration from part (a). A0 if 24·8 approximated to 25 and 'Yes' stated. *Alternative methods. (Using v = 25)* $a = \frac{25^2 - 4^2}{2 \times 100}$ *OR* $u^2 = 25^2 - 2 \times 3 \times 100$ *M1* *= 3·045* *u = 5* *So a = 3 not enough.* *So u = 4 not enough* *A1* *('not enough' must be indicated for A1)* *Also (continuing from position reached in (a))* (v^2 =) $20^2 + 2 \times 3 \times 36$ (= 616) M1 (v =) 24·8(...)(ms^{-1}) A1 (so velocity of 25ms^{-1} not reached)
10. 125% ≡ 297(lb) (Initial weight =) $\frac{297 \times 100}{125}$ = 237·6(lb) ≈ $\frac{237·6}{2·2}$ (kg) or $\frac{237·6 \times 5}{11}$ = 108(kg)	B1 M1 A1 M1 A1 5	Accept any indication. Or equivalent e.g. 297 / 1·25. F.T. 'their 237·6'.

Alternative method

$\frac{297}{2·2}$ M1

= 135(kg) A1

125% ≡ 135 B1 F.T.

(Initial weight)

$\frac{135}{125} \times 100$ M1

= 108(kg) A1

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GCSE Mathematics - Unitised Unit 1 Higher Tier November 2014	Mark	Final Mark Scheme Comments
11. $2 \times \frac{11}{8}$ or equivalent. $\times \frac{40}{60}$ or equivalent $= 11/6$ (hrs) $= 1$hrs 50min	M1 M1 A1 B1 4	M2 for correct use of the '2' with all four of the numbers 11, 8, 40 and 60. M1 for correct use of the '2' with any two of the numbers 11, 8, 40 and 60. C.A.O. or equivalent e.g. 1·83...(hrs). F.T. conversion from 'their 11/6' only if of equivalent difficulty (not ½ an hour). Allow 2hrs 11min or 2hrs 10min as FT from 2·18…hrs.
12. Sight of 19·5(min) AND 20·5(min) Sight of 24×60 (= 1440)(min) $\frac{24 \times 60}{19{\cdot}5}$ OR $\frac{24 \times 60}{20{\cdot}5}$ 73·8(....) AND 70·2(...) (Greatest number =) 74 AND (Least number =) 71	B1 B1 M1 A1 A1 5	Accept 19min 30sec. AND 20min 30sec. for B1. May be implied in calculations. F.T numerator only for $24 \times 60 \times 60$ or 60×60. F.T. if 'least $19 \leq t < 20$ OR greatest $20 < t \leq 21$'. F.T. 'their 73·8' AND 'their 70·2' rounded up. A0 for 73 and 70 (First capsule not considered).
13(a) $\frac{\theta}{360} \times \pi \times 20^2 - \frac{\theta}{360} \times \pi \times 7^2 = 199{\cdot}1$ $(\theta =) \frac{199{\cdot}1 \times 360}{\pi \times (20^2 - 7^2)}$ $= 65(°)$ (b) Sight of $\frac{65}{360} \times 2 \times \pi \times 20$ OR $\frac{65}{360} \times 2 \times \pi \times 7$ $= 22{\cdot}7$ OR $= 7{\cdot}9$ (Perimeter =) $22{\cdot}7 + 7{\cdot}9 + 13 + 13$ $= 56{\cdot}6$(m)	M1 m1 A1 M1 A1 M1 A1 7	Or equivalent. SC1 for 57(°) FT 'their 65' for all 4 marks Accept 22·6(...) and 7·9(...). F.T. their 'arc lengths' only if the method used for finding each of the arcs is correct.
14 Sight of $\frac{2}{3} \times \pi \times 20^3$ or 16755(·1...) or $16000\pi/3$ Sight of $\frac{1}{3} \times \pi \times 15^2 \times h$ $\frac{1}{3} \times \pi \times 15^2 \times h = 9/40 \times \frac{2}{3} \times \pi \times 20^3$ $(20 - d =)$ or $(h =) \frac{9 \times 2 \times \pi \times 20^3 \times 3}{40 \times 3 \times \pi \times 15^2}$ or equivalent. $= 16$(cm) $(d =)$ 4(cm)	B1 B1 M1 A1 A1 6	B0 if $\frac{2}{3} \times \pi \times 20^3$ evaluated incorrectly and used in further work. *'h' clearly being the height of the cone.* *May be written as (20 - d). Do not penalise lack of brackets at this stage.* F.T. 'their cone vol.' = 9/40 × 'their hemisphere vol.' For M1. (l.h.s. =235·6..× h r.h.s. =3769·9 or 3770). *Allow M1only if (20 - d) is used without acknowledgement of the brackets.* (3770 ÷ 235·6) F.T. 20 - 'their 16' if M1 gained.

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4351/01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: Mathematics in Everyday Life

FOUNDATION TIER

A.M. MONDAY, 9 June 2014

1 hour 15 minutes

ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **4**.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**4**	
2.	**6**	
3.	**4**	
4.	**8**	
5.	**5**	
6.	**6**	
7.	**4**	
8.	**5**	
9.	**3**	
10.	**3**	
11.	**5**	
12.	**3**	
13.	**2**	
14.	**7**	
Total	**65**	

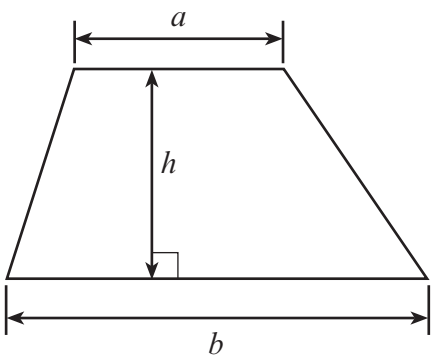
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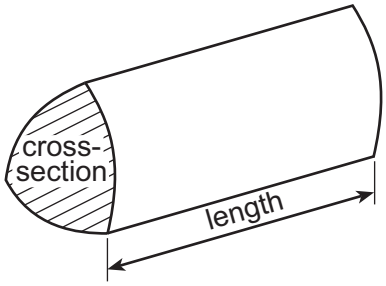
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Formula List

Area of trapezium $= \frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



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1. A leaflet showed the population of various areas in Wales.
It gave the information in words and in figures.

(a) Complete the entries for the following two places in words and figures. [2]

Anglesey

Sixty-nine thousand and twenty-five

Gwent

550 704

(b) How much greater was the population of Gwent than the population of Anglesey?
Give your answer correct **to the nearest 1000**. [2]

To the nearest 1000: .....

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Turn over.

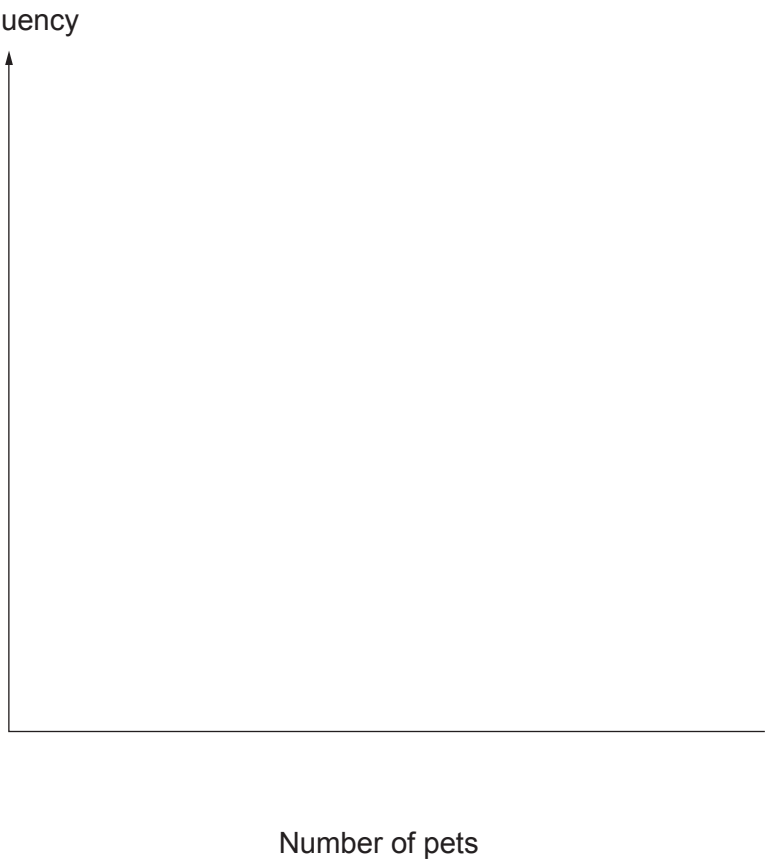
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2. The number of pets in each house in a street was recorded.
A summary of the results is given below.

Number of pets	0	1	2	3	4
Frequency	6	8	5	2	1

(a) On the diagram below draw a vertical line diagram to show this information. [4]



(b) Calculate the total number of pets in these houses. [2]

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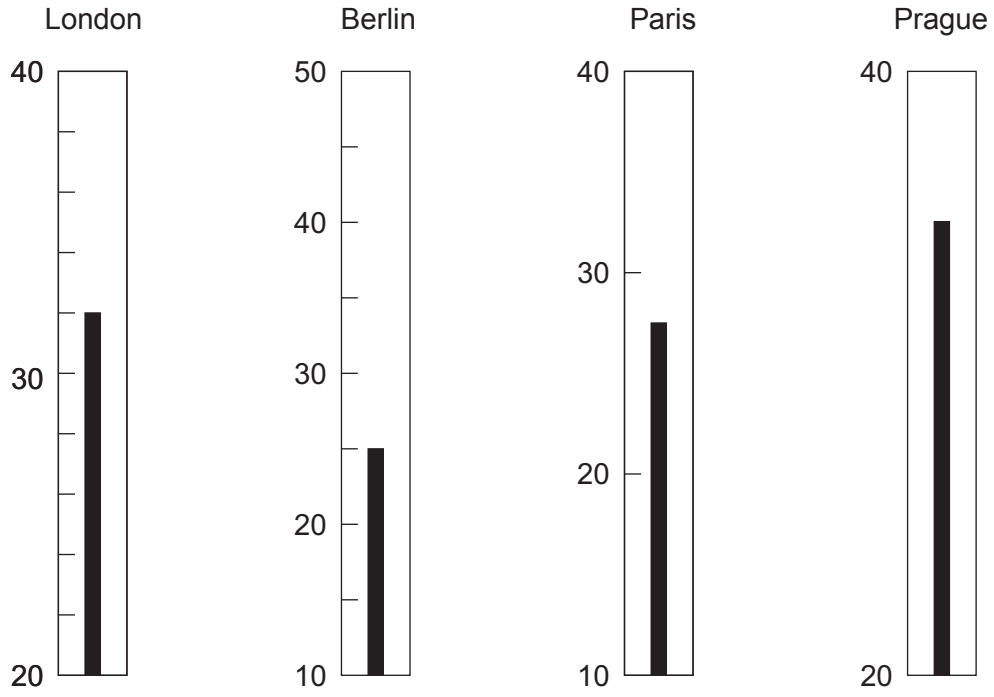
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3. Four pen-friends recorded the midday temperatures in the cities where they lived.
The diagrams below show the readings given, in °C, on the thermometers they used.
Some of the scale notches on two of the thermometers have worn off.



Complete the table below, listing the cities in order of temperature, starting with the coolest.
Give the accurate temperatures for London and Berlin.
Give an estimate for the temperatures in Paris and Prague. [4]

Space for notes .....

.....

.....

Coolest ⟶ *Warmest*

City				
Temperature (°C)				

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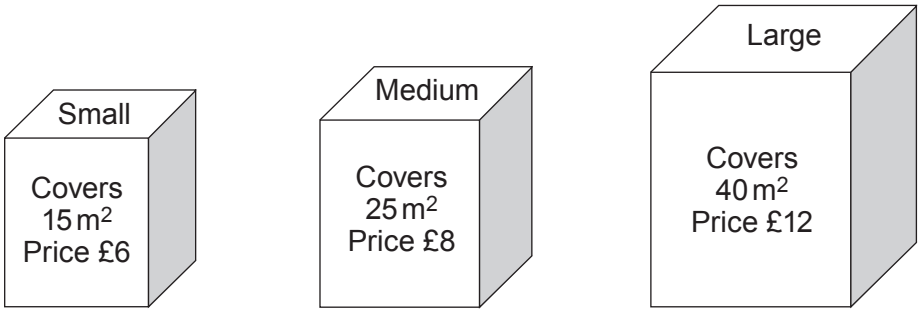
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4. *(a)* *You will be assessed on the quality of your written communication in this part of the question.*

A piece of land with an area of 140 m^2 is to be seeded.

Boxes of seed are sold in three different sizes as shown below.



Just enough seed must be bought with **no** seed left over.
Show clearly how this could be done in **two different** ways.
Calculate the cost in each case.
Show all your working. [6]

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(b) Another piece of land is also to be seeded.
It is rectangular and measures 15 metres by 11 metres.
If you bought the same amount of seed as in part *(a)*, which **extra** box of seed would you need to buy in order to have just enough seed for this piece of land?
You must show all your working to support your answer. [2]

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5. A hedge-cutting firm uses the following formula to calculate how much they should charge customers.

Charge = £2 per 10 metre length + cost of fuel

(a) How much would the firm charge a farmer for cutting 640 metres of hedge when the cost of the fuel used was £12? [2]

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(b) A town council was charged £205 to cut the hedges in the local park.
The cost of the fuel used was £15.
How many metres of hedge were cut? [3]

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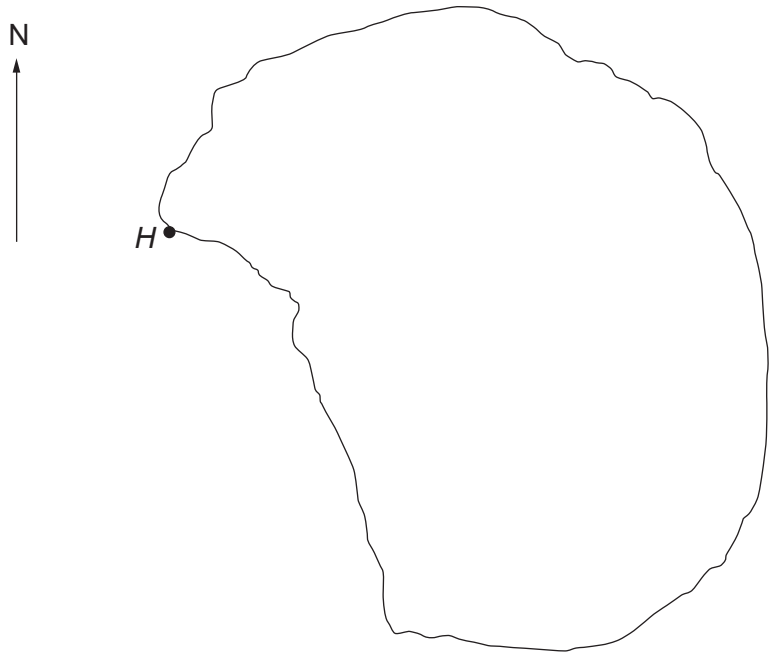
6. A Youth Hostel (*H*) is situated on the shore of a lake as shown below.

Two points, *A* and *B*, are also on the shore of the lake.
Both points are 150 metres from *H*, and *A* is further north than *B*.

(a) (i) Using a scale of,

1 cm represents 25 metres,

clearly mark with dots (●) the position of point *A* and the position of point *B*. [2]



(ii) What is the actual distance between point *A* and point *B* straight across the lake? [2]

.....

.....

(b) Steve rows in a straight line from *H* to point *A*.
At point *A* he turns and rows in a straight line from point *A* to point *B*.

Use your protractor to measure the obtuse angle he turns through at point *A*. [2]

Obtuse angle turned through = ... °

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7. A group of 17 children and 5 adults paid a total of £103 for tickets to see a show.
Each adult's ticket cost £7.
How much did each child's ticket cost? [4]

Examiner only

8. Anna travelled 200 miles by car from Preston to Bristol.
Her car clock showed the time to be 13:25 at the start of her journey.
She stopped at a motorway service station at 3:40 p.m.
At 4:05 p.m. she continued on her journey.
When she arrived at Bristol her car clock showed the time to be 17:50.

What was her average speed **whilst driving**?
You must give the units for your answer. [5]

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9. A concrete base is to be laid for a garage.
The base must measure 5·5 metres long, 3·8 metres wide and have a depth of 12 centimetres.



Diagram not drawn to scale

What will be the volume of this concrete base in **cubic metres** (m^3)? [3]

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Examiner only

10. The diagram shows the positions of two ships *A* and *B*.
Ship *A* and ship *B* both receive a distress call at the same time.
Ship *A* locates the call on a bearing of 135°.
Ship *B* locates the call on a bearing of 215°.

On the diagram below show the position from where the distress call was sent. [3]



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11. A currency exchange shop displays the following two posters.

Need some euros this Summer?

£1 will buy you 1·28 euros.

Back from holiday? Need to change your euros into pounds?

1·50 euros will buy you £1.

Keith went to the exchange shop to buy 600 euros for his trip to Portugal.
The following day he realised that he would be unable to go on the trip.
He returned to the exchange shop and changed the 600 euros back into pounds.
The shop was displaying the same information as shown above.

How much money did Keith lose because of these two transactions? [5]

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12. Martha wants to test the following hypothesis.

'More men than women buy a daily newspaper.'

She plans to

- hand out a short questionnaire at a Women's Institute meeting,
- ask the following questions in the questionnaire,

(i) How old are you?

(ii) How often do you buy a newspaper?

Never ☐ 1-3 times ☐ 3-5 times ☐ More than 5 times ☐

- collect their replies at the next meeting.

Write down **three** unfavourable comments about this plan. [3]

1. .....

.....

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2. .....

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3. .....

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13. Calculate $\sqrt{24{\cdot}6 - 13{\cdot}8^3}$, correct to 3 significant figures. [2]

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14. *(a)* A company was set up with 500 workers.
At the end of each of the first three years the company employed more workers.
The number of additional workers employed each year was equal to two-fifths of the number of workers that were there at the start of that year.

How many people worked for the company in the fourth year? [4]

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(b) Calculate the percentage increase in the number of workers from the first year to the fourth year. [3]

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END OF PAPER

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Question number	Additional page, if required. Write the question number(s) in the left-hand margin.

Examiner only

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GCSE MARKING SCHEME

MATHEMATICS - UNITISED

SUMMER 2014

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INTRODUCTION

The marking schemes which follow were those used by WJEC for the Summer 2014 examination in GCSE MATHEMATICS - UNITISED. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

	Page
Unit 1 - Foundation Tier	1
Unit 1 - Higher Tier	4
Unit 2 - Foundation Tier	7
Unit 2 - Higher Tier	10
Unit 3 - Foundation Tier	12
Unit 3 - Higher Tier	15

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UNIT 1 - FOUNDATION TIER

<table>
<tr><th>JUNE 2014 UNIT 1
Foundation Tier</th><th>P</th><th>Mark</th><th>Comments</th></tr>
<tr><td>Ribbon marking for 1(a) and 1(b).
1. (a) 69025
Five hundred and fifty thousand seven hundred and four

(b) Sight of 481679
482000</td><td></td><td>B1
B1

B1
B1</td><td>
Ignore incorrect spelling.

F.T. 550704 – ‘their number for Anglesey’
F.T. from their calculation. Implies first B1 if no contradicting work.</td></tr>
<tr><td>2. (a) 0, 1, 2, 3 and 4 shown on the horizontal axis.
Uniform scale starting at 0 on the frequency axis.
Five vertical lines at correct height (± 2mm).</td><td>P
P
P
P</td><td>B1
B1
B2</td><td>Ignore unequal spacing.

F.T. where possible from a previous B0.
Accept intent to draw vertical lines.
B1 for four vertical lines at correct height.
B1 for five bars drawn at correct height.
B1 for sight of five correct plots.</td></tr>
<tr><td>2. (b) $(6 \times 0) + 8 \times 1 + 5 \times 2 + 2 \times 3 + 1 \times 4$

$= 28$</td><td></td><td>M1

A1</td><td>For the intent to multiply values by their frequencies and then add.
C.A.O.</td></tr>
<tr><td>3. View with diagram
<table><tr><td>Berlin</td><td>Paris</td><td>London</td><td>Prague</td></tr><tr><td>25</td><td>26 to 29</td><td>32</td><td>34 to 36</td></tr></table></td><td></td><td>B3

B1</td><td>View with diagram for B3 marks.
B3 for four correct entries. B2 for three correct entries.
B1 for one or two correct entries. Allow on diagram.
For correct order. F.T. their temperatures.</td></tr>
<tr><td>4(a) A correct combination with cost.

A different combination with cost.

Look for
• spelling
• clarity of text explanations,
• the use of notation (watch for the use of ‘=’, £ being appropriate)
• correct units shown

QWC2: Candidates will be expected to
• present work clearly, with words explaining process or steps.
AND
• make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer.
QWC1: Candidates will be expected to
• present work clearly, with words explaining process or steps.
OR
• make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer.</td><td>P
P

P
P

P
P</td><td>B2

B2

QWC 2</td><td>B1 for a correct possible choice with no cost or an incorrect cost.
B1 for an incorrect combination of at least four containers with a correct cost.
B1 for a different correct possible choice with no cost or an incorrect cost.
B1 for a different incorrect combination of at least four containers with a correct cost.

<table><tr><th>Small</th><th>Medium</th><th>Large</th><th>Cost</th></tr><tr><td>0</td><td>4</td><td>1</td><td>(£)44</td></tr><tr><td>1</td><td>5</td><td>0</td><td>(£)46</td></tr><tr><td>4</td><td>0</td><td>2</td><td>(£)48</td></tr><tr><td>5</td><td>1</td><td>1</td><td>(£)50</td></tr><tr><td>6</td><td>2</td><td>0</td><td>(£)52</td></tr></table>
QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar.

QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar.
OR
Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar.

QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar.</td></tr>
<tr><td>4(b) Use of 15×11
Sight of $165(m^2)$ AND ‘Medium box’</td><td></td><td>M1
A1</td><td>Implied by sight of $165(m^2)$.
Accept ‘$25(m^2)$ box’ or ‘£8 box’ for ‘Medium box’.
‘$25(m^2)$ box’ or ‘£8 box’ or ‘Medium box’ alone is M0A0.</td></tr>
</table>

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JUNE 2014 UNIT 1 Foundation Tier	P	Mark	Comments
5(a) (Charge =) (£)2 × 64 + (£)12 = (£)140		M1 A1	SC1 for an answer of (£)1292 or (£)129.2(0)
5(b) $\frac{205 - 15}{2}$ or equivalent = 95 950(metres)		M1 A1 A1	F.T. 'their 95' × 10 only if M1 gained. *Trial and improvement should show ÷10, ×2, +15 for M1 Then A2 C.A.O.*
Ribbon marking for 6(a)(i), 6(a)(ii) and 6(b). **All parts to be viewed with diagram.** 6(a)(i) Points A and B in correct position. (ii) 8 (± 0·2) × 25 = 200 (± 5) (m) (b) 132(±4) (°)		 B2 M1 A1 B2	**Use overlay and measuring tools.** B1 for each (ignore labelling). *Use overlay for tolerance allowance.* F.T. their AB length (±0·2cm) × 25. B1 for 48(±4) (°). F.T. from their diagram.
7. (£)103 – 5 × (£)7 = (£)68 (£)68 ÷ 17 = (£)4	P P P P	M1 A1 M1 A1	F.T. 'their £68'.
8. (Time driving = 2hrs 15min + 1hr 45min) = 4 (hours) or 240(min) (Av. Speed =) $\frac{200}{4}$ = 50 m.p.h.	 P P P P P	 B2 M1 A1 U1	B1 for sight of either 2(hrs) 15(min) or 135(min) OR 1(hr) 45(min) or 105(min) *Alternative method* *4hours 25min – 25min* *= 4(hours) B2* *B1 for sight of 4(hrs) 25(min) or 265(min).* F.T. their time. Do not penalise if they incorrectly note 'their F.T. time' (e.g. use 3·3 for 3hrs 30 min). A0 if they have incorrectly used 'their F.T. time'. Independent of other marks. Allow any unambiguous correct notation. *200 / 240 = 0·83(33..). m.p.min gains M1,A1,U1.* *200 / 240 = 0·83(33..). m.p.h gains M1,A1,U0.* *200 / 240 = 0·83(33...) gains M1,A1,U0.*
9. Use of 'Volume = length × width × height' (Volume =) 5·5 × 3·8 × 0·12 = 2·5(08 m^3)		M1 m1 A1	Allow m1 for 550 × 380 × 12 C.A.O. If 0 marks awarded, SC1 for sight of 0·12
10. **Use overlay** Position at 135° from ship A. Position at 215° from ship B. Position marked OR two intersecting lines.		 M1 M1 A1	± 2° (use overlay). Allow the M marks for dots, crosses or any unambiguous indication that the correct bearings have been offered. F.T. if at least M1 and two intersecting lines. (Lines must originate from ship A and ship B respectively)
11. (cost of 600 euros =) $\frac{600}{1·28}$ = (£)468.75 (600 euros bought) $\frac{600}{1·50}$ = (£)400 (Keith lost) (£)68.75	P P P P P	M1 A1 M1 A1 A1	 F.T. their amounts. Dependent on **both** M1.

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JUNE 2014 UNIT 1 Foundation Tier	P	Mark	Comments
12. Three different valid comments. e.g. 'Not representative of population' 'Not relevant to the hypothesis being tested' 'Personal' 'Gender not asked' 'Does not specify over what period of time', 'Can tick one of two boxes if answer is 3' 'People might forget to bring them' 'Might be different people at the next meeting'	P P P	B3	*Ignore irrelevant statements.* B1 for each different valid comment. Accept equivalent statements e.g. 'biased' (by gender or interest group). Do not give more than one mark for similar criticism(s).Reference to location should only be credited once. (criticisms of question (i)) (criticisms of question (ii)) (criticisms of the method of collection)
13. 35·5		B2	B1 for 35·4(924.....)
Ribbon marking for 14(a) and 14(b). 14. (a) $500 + 500 \times {}^{2}/_{5}$ or equivalent $= 700$ Two further correct steps. (Number of workers =) 1372 (b) (1372 – 500 =) 872 872 / 500 × 100 = 174(·4%)	P P P P P A1	M1 A1 M1 A1 B1 M1 A1	Allow M1A0 for '200'. Allow M1A1 for '200 extra'. M1A1 implied by sight of 1100 (or 1300). Ignore continuing to an additional year. C.A.O. Mark final answer. *Alternative method.* $500 \times (1{\cdot}4)^3$ *M2* $= 1372$ *A2* *Allow* $500 \times (1{\cdot}4)^4$ *M2* $= 1920{\cdot}8$ *(or 1921)* *A1* F.T. 'their 1372'. FT 'their 1372 – 500' If no marks gained then allow SC1 for an answer of 274(·4%) or equivalent on F.T.

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UNIT 1 - HIGHER TIER

June 2014 UNIT 1 Higher Tier	P	Mark	Comments
1. Three different valid comments. e.g. 'Not representative of population' 'Not relevant to the hypothesis being tested' 'Personal' 'Gender not asked' 'Does not specify over what period of time', 'Can tick one of two boxes if answer is 3' 'People might forget to bring them' 'Might be different people at the next meeting'	P P P	B3	*Ignore irrelevant statements.* B1 for each different valid comment. Accept equivalent statements e.g. 'biased' (by gender or interest group). Do not give more than one mark for similar criticism(s).Reference to location should only be credited once. (criticisms of question (i)) (criticisms of question (ii)) (criticisms of the method of collection)
2. **Use overlay** Position at 135° from ship A. Position at 215° from ship B. Position marked OR two intersecting lines.		M1 M1 A1	± 2° (use overlay). Allow the M marks for dots, crosses or any unambiguous indication that the correct bearings have been offered. F.T. if at least M1 and two intersecting lines. (Lines must originate from ship A and ship B respectively)
3. (Salary received) (£)30000 × 0·7 = (£)21000 (Cost of petrol) $\frac{8000}{40}$ × (£)6·25 = (£)1250 (New salary received) = (£)14000 (Loss) (£)21000 – (£)1250 – (£)14000 = (£)5750 Look for • spelling • clarity of text explanations, • the use of notation (watch for the appropriate use of '=' and operators) • '£' shown where appropriate. QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	P P P P P P P P P	M1 A1 M1 A1 B1 M1 A1 QWC 2	Or F.T. 2/3 × 'their 21000'. F.T. their <u>three stated</u> values. (Look for '19750 – 14000' or '21000 – 15250') QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar

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June 2014 UNIT 1 Higher Tier	P	Mark	Comments
4. (cost of 600 euros =) $\frac{600}{1{\cdot}28}$	P	M1	
= (£)468.75	P	A1	
(600 euros bought) $\frac{600}{1{\cdot}50}$	P	M1	
= (£)400	P	A1	
(Keith lost) (£)68.75	P	A1	F.T. their amounts. Dependent on **both** M1.
5. 35·5		B2	B1 for 35·4(924.....)
Ribbon marking for 6(a) and 6(b).			
6. (a) $500 + 500 \times {}^{2}/_{5}$ or equivalent	P	M1	Allow M1A0 for '200'. Allow M1A1 for '200 extra'.
= 700	P	A1	M1A1 implied by sight of 1100 (or 1300).
Two further correct steps.		M1	Ignore continuing to an additional year.
(Number of workers =) 1372	P	A1	C.A.O. Mark final answer.
	P		*Alternative method.* *$500 \times (1{\cdot}4)^3$ M2* *= 1372 A2* *Allow* *$500 \times (1{\cdot}4)^4$ M2* *= 1920·8 (or 1921) A1*
(b) (1372 – 500 =) 872		B1	F.T. 'their 1372'.
872 / 500 × 100		M1	FT 'their 1372 – 500'
= 174(·4%)		A1	If no marks gained then allow SC1 for an answer of 274(·4%) or equivalent on F.T.
7. (a) Appropriate uniform scale on vertical axis.		B1	Must allow for all plots up to (£6000, £1100). Need not start at 0. Allow 'steps of £1000'.
Line starts at (0, 500).		B1	Accept plot at (0,500) if no line drawn.
Straight line with correct gradient (£100 per £1000).		B1	
7.(b) A comment that states that it may appear that reported crime has decreased because the axes are not perpendicular.		B2	Accept any wording that suggests this. B1 if only refers to the misunderstanding. B1 if only refers to the reason.
8. Sight of 8·5 (litres) or equivalent	P	B1	
Sight of $\frac{7 \times 24}{5}$	P	M1	Allow for (7×24) / an attempt at time difference.
× 8·5	P	m1	F.T. 'their 8·5' (including use of 8).
= 285·6 (litres)	P	A1	C.A.O. Allow 286 (litres) or 285 (litres) from correct working.
Ribbon marking for 9(a) and 9(b).			
9. (a) (Volume of sphere) $4/3 \times \pi \times 5^3$		M1	
= 523·6 (cm^3) or $\frac{500\pi}{3}$		A1	Accept 523 to 524 inclusive.
(b) (Volume of cylinder) $\pi \times 5{\cdot}5^2 \times 63$	P	M1	
= 5987·1(cm^3)	P	A1	Accept 5984 to 5989·5 inclusive.
(Empty space for cyl.) $2 \times 5987{\cdot}1 - 12 \times 523{\cdot}6$	P	M1	F.T. their derived volumes only if more than one cylinder required.
	P		
= 5691(cm^3)	P	A1	
(Empty space for box) $42 \times 32 \times 11 - 12 \times 523{\cdot}6$	P	M1	F.T their volume for a sphere.
= 8500(·8..)(cm^3)		A1	
10. Use of R = 6 AND N = 3		B1	
$\left[\left(1+\frac{6}{100\times 3}\right)^3 - 1\right] \times 100$		M1	Allow FT for N = 4 only.
(AER =) 6·12 (%)		A1	N = 4 leads to an answer of 6.14 (%)

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June 2014 UNIT 1 Higher Tier	P	Mark	Comments
11. (Distance) $30 \times ⅓ + 45 \times ⅓ + 60 \times ⅓$ $= 45$ (miles)	P P	M1 A1	*Note: 45 minutes is M0A0.*
(Time) 15/30 + 15/45 + 15/60 $= 1^{1}/_{12}$ (hr) or 65(min) or equivalent. ISW	P P	M1 A1	May be implied. F.T. 'one third of their distance'.
Ribbon marking for 12(a) and 12(b). 12(a) Sight of (arc length =) 10·8(m) Use of $A\hat{O}B /360 \times 2 \times \pi \times 8{\cdot}6 = 10{\cdot}8$ $A\hat{O}B = \frac{10{\cdot}8 \times 360}{2 \times \pi \times 8{\cdot}6}$ $= 71{\cdot}9(..)$ or $72^{(°)}$ (b) (Area =) $72/360 \times \pi \times 8{\cdot}6^2$ $= 46{\cdot}4(..)$ (m^2)	P P P P	B1 M1 m1 A1 M1 A1	F.T. 'their arc length' (including use of 28). F.T. 'their 72°'. Accept 46·4 to 46·5 inclusive.
13. (Total volume =) $h^3 + ⅓ \times \pi \times r^2 \times 4h$ $h^3 + ⅓ \times \pi \times r^2 \times 4h = 648{\cdot}6$ $h^3 + ⅓ \times \pi \times h^2 \times 4h = 648{\cdot}6$ $h^3 = 125$ $h = 5$(cm) $H = 25$ (cm)	P P P P P P	B1 M1 m1 A1 A1 B1	Radius 'r' may be shown as 'h'. F.T. h^3 + 'their cone volume'. C.A.O. F.T. 'their h^3' if M1 gained F.T. 5 × 'their derived h'.

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4351/01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: Mathematics in Everyday Life
FOUNDATION TIER

A.M. FRIDAY, 10 January 2014

1 hour 15 minutes

ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **5***(a)*.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**6**	
2.	**7**	
3.	**4**	
4.	**4**	
5.	**8**	
6.	**3**	
7.	**4**	
8.	**5**	
9.	**7**	
10.	**6**	
11.	**3**	
12.	**4**	
13.	**4**	
Total	**65**	

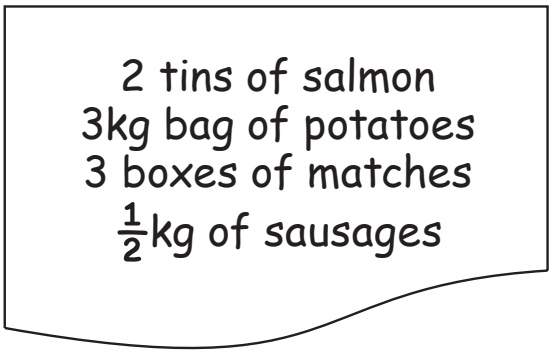
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1. Harry has been shopping for his elderly neighbour.
The neighbour had given him the following list of items that she wanted.



(a) Complete the bill shown below. [4]

Item	Cost
2 tins of salmon at £2.69 each	£5.38
3 kg of potatoes at £1.15 per kg	
3 boxes of matches at 32p per box	
$\frac{1}{2}$ kg of sausages at £5.60 per kg	
TOTAL COST	

(b) Harry was given two £10 notes by his neighbour to pay for the items bought.
How much change should Harry give his neighbour? [2]

.....

.....

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2. Thirty-two competitors took part in a book quiz.
The points that each competitor gained in the quiz are shown below.

16	27	18	26	28	10	22	29
25	13	28	23	19	26	14	25
26	15	17	27	11	27	16	21
11	24	29	18	24	12	28	17

(a) A table is drawn to summarise these results and to show the number of medals that were awarded at the end of the competition.

Complete the table by filling in the empty spaces.

You must make sure that all the intervals in the Points column are of equal width. [4]

Points	Tally	Number of competitors	Type of medal
10 to 14	𝍸 /	6	No medal
15 to 19			Bronze
..... to			Silver
..... to 29			Gold

(b) Using the squared paper on the next page, draw a suitable bar chart that shows how the medals were shared. [3]

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3. Five people are timed on how long they take to complete a simple jigsaw.

A time of 25 seconds is given a score of 0.

Each second above 25 gains a score of +1.
For example, a person taking 27 seconds would score +2.

Each second below 25 gains a score of –1.
For example, a person taking 22 seconds would score –3.

The times taken by the five people were as follows.

Alice took 30 seconds,

Bob took 19 seconds,

Karim took 17 seconds,

Dewi took 32 seconds and

Elin took 21 seconds.

Complete the table below to show the **score** that each person was given.
The list should be in **ascending order**, starting with the person with the lowest score. [4]

.....

.....

.....

Name					
Score					

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4. Dylan uses the following formula to work out the 'miles per gallon' for his car.

$$\textbf{miles per gallon} = \frac{\textbf{miles travelled} \times \textbf{4·546}}{\textbf{litres of fuel used}}$$

One weekend, Dylan travelled by car from Holyhead to Swindon.
He then went on to Cardiff before returning to Holyhead.

The distance travelled from Holyhead to Swindon was 256 miles.

The distance travelled from Swindon to Cardiff was 88 miles.

The distance travelled from Cardiff back to Holyhead was 227 miles.

Dylan used a total of 62 litres of fuel for these journeys.

Calculate the 'miles per gallon' for his car for this weekend.
Give your answer to the nearest whole number. [4]

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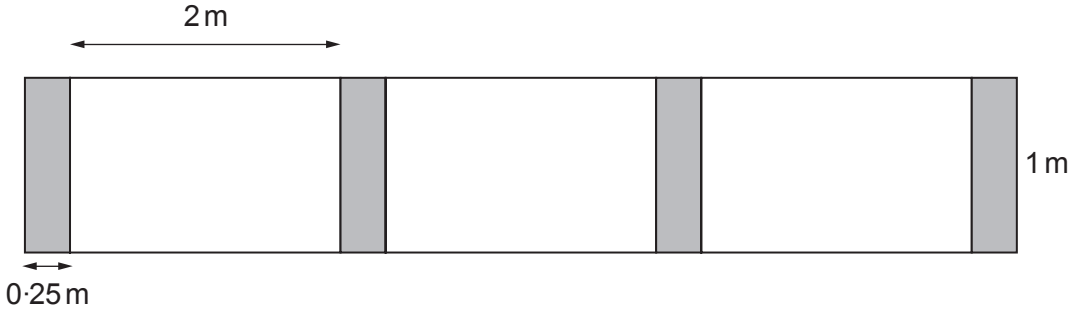
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5. A company wants its logo painted on the side of its main office.
A plan of the logo required is shown below.



Each wide strip is 2 metres by 1 metre and is to be painted blue.
Each narrow strip is 0·25 metres by 1 metre and is to be painted orange.

(a) *You will be assessed on the quality of your written communication in this part of the question.*

Calculate the total area of the logo that will be coloured blue **and** the total area that will be coloured orange.
You must show all your working. [6]

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(b) Gethin is asked to paint the logo.
He has enough orange paint but no blue paint.
At the local shop, blue paint costs £2.50 for a tin that will cover an area of $3\,m^2$.
How much will Gethin have to pay to buy enough blue paint to cover the three wide strips? [2]

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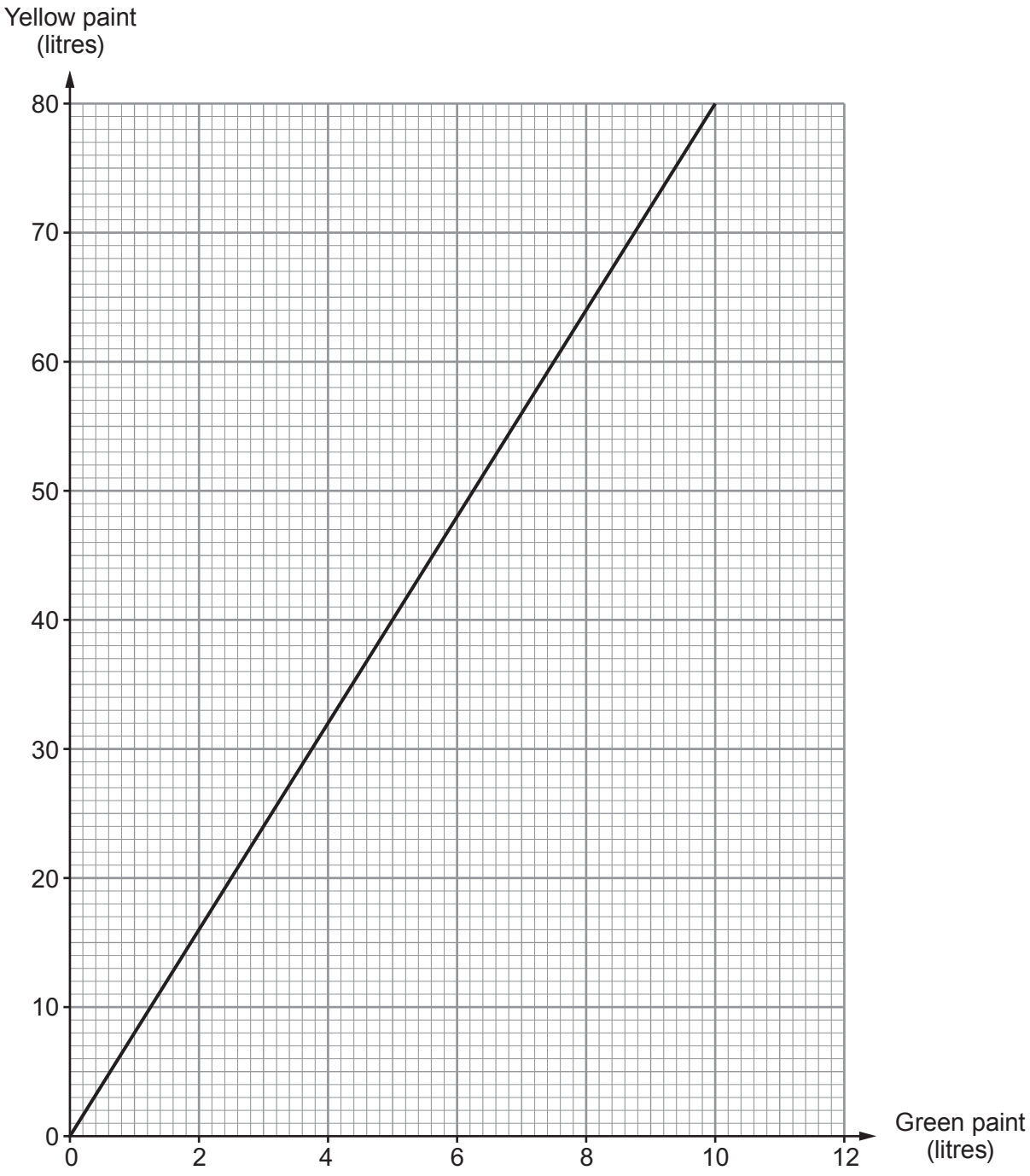
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6. A colour of paint, called *'Meadow'*, is made using green paint and yellow paint.
The graph below shows how much green paint and yellow paint must be mixed together to make different amounts of *'Meadow'* paint.



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(a) What is the **total** amount of *'Meadow'* paint produced when 10 litres of green paint are used? [1]

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..... litres

(b) How much green paint should be mixed with 640 litres of yellow paint? [2]

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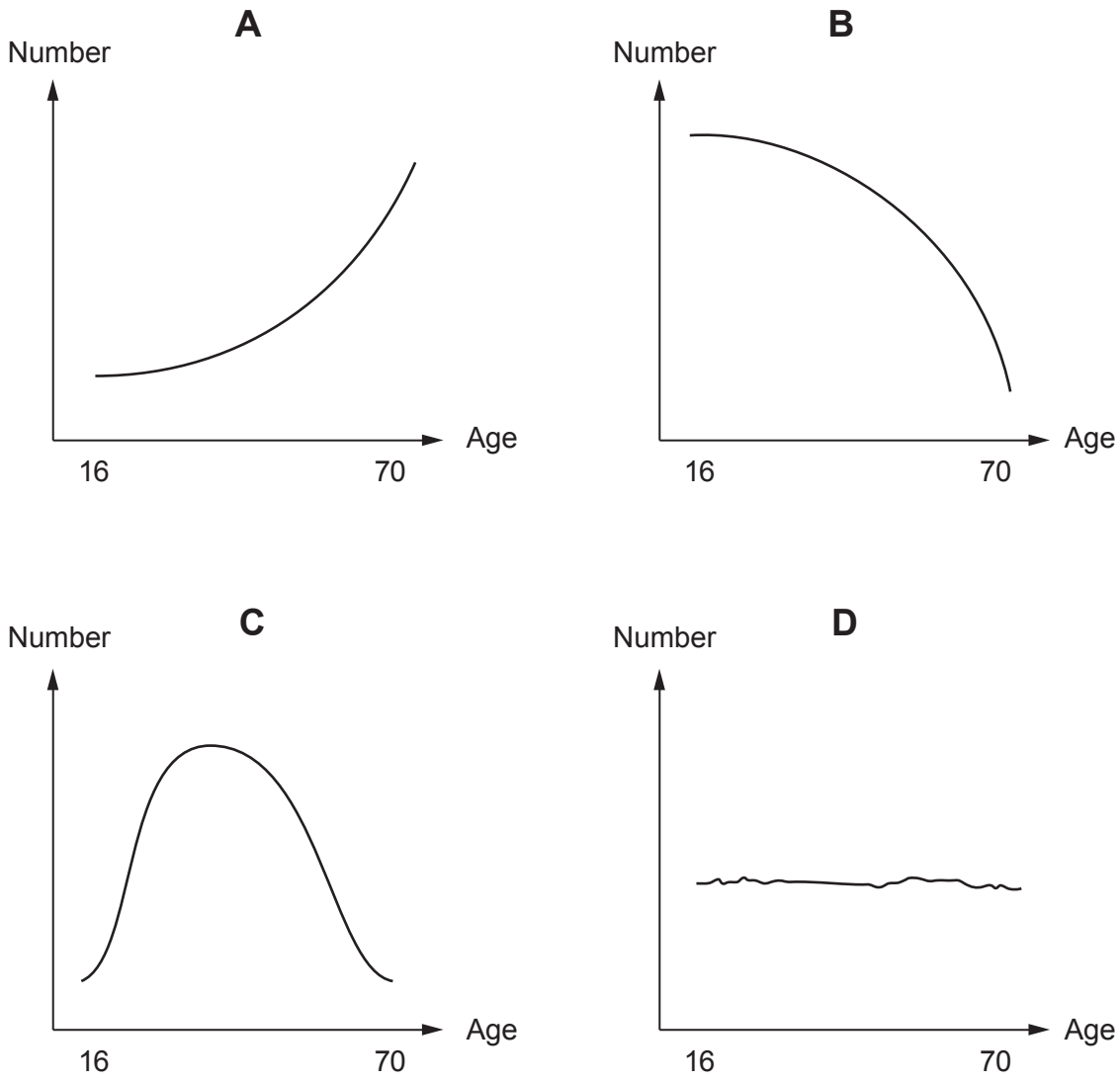
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Turn over.

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7. Look at the four graphs labelled **A**, **B**, **C** and **D** shown below.



Write down which graph **A**, **B**, **C** or **D**, in each case, is most likely to have the following titles.

[4]

'The number of people in full-time employment.' Graph .....

'The number of people who play for a football team.' Graph .....

'The number of people who wear glasses.' Graph .....

'The number of people who are left-handed.' Graph .....

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8. Aled weighs 12 stone 8 pounds. Thomas weighs 85 kilograms.
Which of the two is the heavier, and by how much? [5]

1 stone = 14 pounds. 1 kilogram is approximately 2·2 pounds.

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9. At a stall in a school fair, thirty-two people each paid £3 to choose a sealed envelope from a bag. Each envelope contained a shopping voucher.

The table below shows the number of each type of voucher in the bag.

Value of voucher	Number of vouchers
£1	15
£2	10
£5	5
£10	2

(a) The person in charge of the stall was asked,

"What was the average value of the vouchers?"

She replied,

"Are you asking for the mode, the median or the mean value?"

Show clearly that these three values are different. [5]

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(b) Did this stall make a profit or a loss?
You must calculate the amount of this profit or loss. [2]

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10. Shafira had collected £720 in a sponsored event.

She gave $\frac{1}{4}$ of the amount collected to her local youth club.

She gave $\frac{2}{5}$ of the amount collected to a children's hospital.

The rest of the money she gave to a mountain rescue group.

(a) How much money did Shafira give to the mountain rescue group? [4]

(b) What percentage of the £720 did Shafira give to the mountain rescue group? [2]

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11. Asif used his calculator to find the value of

$$\frac{85 \times 43}{17 + 35}.$$

He pressed the following buttons on his calculator in this order.

8	5	×	4	3	÷	1	7	+	3	5	=

The answer he got was 250. This answer is incorrect.

(a) Explain what Asif did wrong. [1]

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(b) Find the correct value of

$$\frac{85 \times 43}{17 + 35}.$$

Write your answer correct to 3 significant figures. [2]

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Turn over.

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12. Mair will be competing in a half-marathon race.

She uses a route for training that is 10 000 metres long, measured correct to the nearest 100 metres.

Her first complete training run took 73 minutes, measured correct to the nearest minute.

Complete the table below to show the least and greatest distance of her route and the least and greatest time of her training run. [4]

	Least Value	Greatest Value
Distance	..... metres	..... metres
Time	..... minutes	..... minutes

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13. Grace invests £8240 for 2 years at 3% per annum compound interest.
Find the compound interest earned in the 2 years.
Your answer should be given correct to the nearest penny. [4]

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END OF PAPER

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GCSE MARKING SCHEME

MATHEMATICS - UNITISED

JANUARY 2014

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INTRODUCTION

The marking schemes which follow were those used by WJEC for the January 2014 examination in GCSE MATHEMATICS - UNITISED. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

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Unit 2 - Foundation Tier	8
Unit 2 - Higher Tier	13
Unit 3 - Foundation Tier	16
Unit 3 - Higher Tier	19

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UNIT 1 - FOUNDATION TIER

UNIT 1 Foundation Tier	Mark	FINAL MARK SCHEME Comments
1.(a) (2 tins of salmon) (£5.38) (3kg of potatoes) (£)3.45 (3 boxes of matches) (£)0.96 (½kg of sausages) (£)2.8(0) TOTAL (£)12.59 (b) (£)20(.00) – (£)12.59 = (£)7.41	 B1 B1 B1 B1 M1 A1 6	 Accept 96 unless total amount implies £96. Do not accept 0.96p unless total amount implies £0.96 F.T. their amounts. B0 if any 'cost space' left blank. F.T. £20 – 'their total'. M0 if their total ≥ £20. An unsupported answer of (£)8.41 implies M1A0.
2.(a) Showing '20 to 24' AND '25 (to 29)' Showing a tally method used. Showing (6) 8 5 13 (b) Uniform scale for the frequency axis starting at 0. Four bars at correct height	B1 B1 B2 B1 B2 7	 These need not be correct number of tallies. FT their intervals, provided not overlapping. For the 8, 5 and 13. B1 for one or two of them correct. B0 for ambiguous placement of scale numbers. B1 for three correct heights. F.T. their numbers in (a). If no scale shown, assume intervals of 1 from 0 to 15. Penalise uneven bar widths −1.
3. Karim Bob Elin Alice Dewi –8 –6 –4 (+)5 (+)7	B1 B3 4	For a correct order. **Strictly** F.T. their scores. There must be at least two different negative scores. For all five correct scores. B2 for three or four correct scores. B1 for two correct scores.
4. (Total distance travelled) 571 (miles) Correct substitution (571 × 4·546) / 62 42 (m.p.g.)	B1 M1 A2 4	May be implied by sight of 2595(·7..) or 2596 (i.e. 571 × 4·546) F.T. 'their 571' if between 300 and 850 inclusive OR an attempt at a sum of distances seen. A1 for 41·8(67...)

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UNIT 1 Foundation Tier	Mark	FINAL MARK SCHEME Comments
5.(a) (Blue =) 6(m^2) (Orange =) 1(m^2)	B2 B2	If no marks gained, allow a B1 for use of Area = length × width. Allow 2 × 1 or 2 × (1+1+1) or (2+2+2) × 1. OR 0·25 × 1 or 0·25 × (1+1+1+1) or (0·25+0·25+0·25+0·25) × 1 to illustrate understanding. Also allow B1 for (Blue =) 2×3×3 (=18) or (Orange =) 0·25×4×4 (=4). Clear use of perimeter instead of area is B0.
Look for • spelling • clarity of text explanations, • the use of correct units. For **QWC2** blue and orange areas must be clearly **identified** AND the **correct units** must be given for the areas. QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	QWC 2	QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar
(b) 6/3 × 2.50 (£)5	M1 A1 8	FT 'their blue area' /3, rounded to the nearest whole number above, and then multiplied by 2·5
6.(a) 90(litres) (b) A correct method shown 80(litres)	B1 M1 A1 3	e.g attempt to read graph at 64 yellow and × 10. OR attempt to read graph at 80 yellow and × 8.
7. C B A D	B1 B1 B1 B1 4	
8. (Aled) 12 × 14 + 8 = 176(lbs) (Thomas) 85 × 2·2 = 187(lbs) Thomas by 11lbs	M1 A1 M1 A1 A1 5	M1A0 for 176kg. M1A0 for 187kg. F.T. only if 160lbs ≤ Aled's weight ≤ 190lbs . Name and correct units must be given. *<u>Alternative methods:</u>* *12 × 14 + 8* *85 × 2·2* *M1* *= 176(lbs)* *= 187 (lbs)* *A1* *176 / 2·2* *187/ 14* *M1* *= 80(kg)* *13·35(7..)(st)* *A1* *Thomas by 5kg* *Thomas by 0·78(..)st (accept 0·8 st) ISW* *A1(FT)* *(allow 10·9lb to 11·2lb inc.)*

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UNIT 1 Foundation Tier	Mark	FINAL MARK SCHEME Comments
9.(a)		For each B mark, do not award if an incorrect reason is clearly shown.
Mode value given as (£)1.	B1	Must be unambiguously shown as the mode value.
Median value given as (£)2.	B1	Must be unambiguously shown as the median value.
(Mean =) 15 × (£)1 + 10 × (£)2 + 5 × (£)5 + 2 × (£)10	M1	M1 for a clear attempt at finding Σfx.
÷ 32	m1	
= (£)2.5(0)	A1	C.A.O.
(b) 32 × (£)3 – 32 × (£)2.5(0) or equivalent.	M1	F.T. 'their mean'.
= £16 AND 'Profit'	A1	Also M1 for 32 × (£)3 – 'their Σfx' OR 15 × (£)2 + 10 × (£)1 – 5 × (£)2 – 2 × (£)7 (= (£)30 + 10 – 10 – 14 = (£)16) SC1 for sight of 96 and 80.
	7	
10. (a)		Alternative method
720 – ¼ × 720 – 2/5 × 720	M1	1 –¼ – 2/5 or equivalent M1
Sight of (£)180	B1	= 7/20 or equivalent A1
Sight of (£)288	B1	7/20 × 720 or equivalent M1
		= (£)252 A1
(Amount left) (£)252	A1	For A1, F.T. (£)720 – 'their (£)180' – 'their (£)288' provided at least one B1 gained. Two amounts must be subtracted from (£)720.
(b) 252 / 720 × 100	M1	F.T. 'their £252'
= 35(%)	A1	Alternative method
		100(%) – 25(%) – 40(%) M1
		= 35(%) A1
	6	
11.(a) A valid explanation that shows an understanding that the 35 was not included in the divisor.	E1	Do not accept 'he pressed the wrong buttons'. Allow e.g. 'He forgot the brackets'. Also allow a correct explanation (an explanation, not just a calculation) of what Asif should have done.
(b) 70·3	B2	B1 for 70·2(8846...)
	3	
12. Least Value Greatest Value		B1 for each correct entry.
9950 10050		Accept 10049·9 recurring but not 10049·9.
	B4	
72·5 73·5		Accept 73·49 recurring but not 73·49. Allow 72min. 30(sec). and 73min 30(sec).
	4	
13. 8240		
247.2(0)	B1	For the evaluation of a correct 3% OR Sight of 1·03 (494.4 implies 2× 247.2 and gains B1).
8487.2(0)		
254.61(6)	M1	For attempting to find 2 different 3%. OR 8240 × $1{\cdot}03^2$.
8741.81(6) or 8741.82 OR 247.2(0) and 254.61(6)	A1	
(£)501.82	A1	F.T. one error. Must be given correct to the nearest penny. (£)501.81 is B1M1A1A0. Treat depreciation as a mis-read.
	4	

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UNIT 1 - HIGHER TIER

UNIT 1 Higher Tier	Mark	FINAL MARK SCHEME Comments
1. (a) A valid explanation that shows an understanding that the 35 was not included in the divisor. (b) 70·3	E1 B2 3	Do not accept 'he pressed the wrong buttons'. Allow e.g. 'He forgot the brackets'. Also allow a correct explanation (an explanation, not just a calculation) of what Asif should have done. B1 for 70·2(8846...)
2.(a) Mode value given as (£)1. Median value given as (£)2. (Mean =) 15 × (£)1 + 10 × (£)2 + 5 × (£)5 + 2 × (£)10 ÷ 32 = (£)2.5(0) (b) 32 × (£)3 – 32 × (£)2.5(0) or equivalent. = £16 AND 'Profit'	 B1 B1 M1 m1 A1 M1 A1 7	For each B mark, do not award if an incorrect reason is clearly shown. Must be unambiguously shown as the mode value. Must be unambiguously shown as the median value. M1 for a clear attempt at finding Σfx. C.A.O. F.T. 'their mean'. Also M1 for 32 × (£)3 – 'their Σfx' OR 15 × (£)2 + 10 × (£)1 – 5 × (£)2 – 2 × (£)7 (= (£)30 + 10 – 10 – 14 = (£)16) SC1 for sight of 96 and 80.
3. (Milk required 1st week) $7 \times {}^{3}/_{5}$ $= 4{}^{1}/_{5}$ OR ${}^{21}/_{5}$ (Needs to buy) 5 (cartons) (Milk required 2nd week) He has 4/5 of a litre left over. (Requires an extra) $4{}^{1}/_{5} - {}^{4}/_{5}$ $(= 3{}^{2}/_{5})$ (Needs to buy) 4 (cartons)	M1 A1 B1 B1 M1 A1	 F.T. only if there is a requirement to round up. Sight of 4/5 gains B1. F.T. 'their 5 cartons'. F.T. 'their $4{}^{1}/_{5}$' – 'their ${}^{4}/_{5}$' *<u>Alternative method for 2nd week</u>* *Required for 14 days* $14 \times {}^{3}/_{5}$ *M1* *9 cartons A1* *So extra 4 cartons required for 2nd week B1*
Look for • spelling • clarity of text explanations, • the use of correct units. QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	QWC 2 8	QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar

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UNIT 1 Higher Tier	Mark	FINAL MARK SCHEME Comments
4. 8240 247.2(0) 8487.2(0) 254.61(6) 8741.81(6) or 8741.82 OR 247.2(0) and 254.61(6) (£)501.82	 B1 M1 A1 A1 4	 For the evaluation of a correct 3% OR Sight of 1·03 (494.4 implies 2× 247.2 and gains B1). For attempting to find 2 different 3%. OR $8240 \times 1{\cdot}03^2$. F.T. one error. Must be given correct to the nearest penny. (£)501.81 is B1M1A1A0. Treat depreciation as a mis-read.
5. (Area of square =) 400 (cm^2) (Area of circle =) $\pi \times 10^2$ 100π OR 314 to 314·3 inclusive (Percentage visible =) $\frac{400 - 100\pi}{400} \times 100$ = 21(·46...%)	B1 M1 A1 M1 A1 5	Or consistent algebraic equivalent F.T. their two values for area. Accept answers between21(%) and 22(%) inclusive. *Alternative consistent algebraic method* e.g *Use of 'side length' = 2 × 'radius'* *B1* *(Area of square =)* $4r^2$ *B1* *(Area of circle =)* πr^2 *B1* *(% visible =)* $\frac{4r^2 - \pi r^2}{4r^2} \times 100$ *M1* = 21(·46...%) *A1*
6. (£)151.68 ≡ 120% (Original cost) $\frac{151.68}{120} \times 100$ or equivalent = (£)126.4(0)	B1 M1 A1 3	Accept any indication.
7(a) (i) A comment that states or implies that we do not know the number of teenagers and number of 75 year olds considered. (ii) A comment that states or implies that we do not know the actual number of women nor the actual number of men (iii) A comment that states or implies that we do not know the percentage pass rate between 2005 and 2010. (b) Evidence of looking at values in Year 6. A statement that (£)400 is 40% of (£)1000.	B1 B1 B1 B1 B1 5	Accept e.g. 'they might have looked at different numbers'. Accept e.g. 'there are no numbers on the frequency axis'. Accept e.g. 'they might have been different in 2007'. This may be implied e.g. sight of '(£)400 difference' or '(£)1300 AND (£)1700'. 40% alone is B0. e.g. 'Its 40% in Year 6' gains B1B0.

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UNIT 1 Higher Tier	Mark	FINAL MARK SCHEME Comments
8. $36 \times \frac{70}{42}$	M1	Or equivalent.
$\times \frac{10}{15}$	M1	Or equivalent (the 36 must have been used). M1 for correctly using two of the operators '×70', '÷42', '×10' and ' ÷15' with the 36.
= 40 (workers)	A1	C.A.O. Do not penalise pre-approximations as long as 40 given as the final answer. *Alternative presentation.* *Area Time Workers* *42 10 36* *..... Award M1 for correct step(s) to reach 70.* *..... Award M1 for correct step(s) to reach 15.* *..... ....* *70 15 **40** A1 C.A.O.*
	3	
9. Correct substitution into formula.	M1	Do not penalise using (£)165.53 at this stage.
Using 16553(p)	m1	
$U = \frac{16553/1{\cdot}05 - 90 \times 31{\cdot}48}{11{\cdot}546}$ or equivalent	m1	The two 'm' marks may be awarded in either order.
(Units used =) 1120	A1	C.A.O. Accept answers of 1120 ± 1
	4	
10. Sight of 7005 (metres)	B1	
Sight of 1523 (seconds)	B1	
Sight of 1522·5 (seconds) or 25min 22·5sec	B1	FT their conversion to seconds. 1522·5 implies 2nd B1.
Use of 'Distance' / 'Time'	M1	
(Greatest av. Speed) $\frac{7005}{1522{\cdot}5}$	M1	F.T. 'their greatest distance' / 'their least time' only if 'greatest distance' >7000 AND 'least time' < their 1523.
$= 4{\cdot}6(009. .ms^{-1})$	A1	Do not accept an answer unless the correct method has been shown. An answer of 4·6 found using values which are not their greatest distance and least time is M0A0.
	6	
11(a) (Angle subtended in the shaded sector =) 70(°)	B1	May be implied by sight of 210°
Use of $\frac{70}{360} \times \pi \times 8^2 \times 3$	M2	F.T. 'their 70°'. M1 for $\frac{70}{360} \times \pi \times 8^2$ A1 for 39(.09...))
$= 117{\cdot}28(6..)(cm^2)$ or $112\pi/3$	A1	Allow answers between 117·2 to 117·4 inclusive. Do not penalise final answer of 117(cm^2) if previous permissible answer seen. *Note: Using 50° instead of 70° giving a final answer of 83·7(7..) is B0, M2(on follow through), A1.* *BUT if candidates then use $\pi \times 8^2 - 83{\cdot}7(7..) = 117{\cdot}3$, then all marks awarded.*
(b) Use of $\frac{70}{360} \times 2 \times \pi \times 8$ OR sight of 9·77(....)	M1	F.T. 'their 70°'.(*Note: Use of 50° gives 6·98)*
× 3	m1	
+ 48	m1	
= 77·3(.... cm)	A1	Allow 77 (cm) .(*Note: Use of 50° gives 68·9..)* Mark their final answer.
	8	

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UNIT 1 Higher Tier	Mark	FINAL MARK SCHEME Comments
Mark parts (a) and (b) together.		*Take care that the length of the base of the pyramid (10cm) is not confused with the height of the cone (also 10cm).* *If the height of the cone is found in part (a) then award the appropriate marks for this work in part (b).*
12(a) Sight of $\frac{1}{3}\times\pi\times r^2\times h_1$ AND $\frac{1}{3}\times$(area of base)$\times h_2$	B1	For B1 allow unconventional use of notation and symbols as long as accurate intent is clear (e.g. h_1 and h_2 may both be given as 'h' or 'height').
A clear intention to use $h_1 = 2h_2$ in the above.	B1	
$1/3 \times \pi \times 4^2 \times 2h = 1/3 \times (\text{length})^2 \times h$	M1	
$(\text{length})^2 = 32\pi$	A1	Accept 100·45 to 100·6 inclusive.
(side length =) 10(·0.. cm)	A1	SC1 for an answer of 7(·08..cm) (using $h_1 = h_2$). [*Note 10(cm) = height of cone for part (a) is M0A0A0 (unless then used to find the length of the base of the pyramid) but will gain the M1m1A1 in part (b) and possibly go on to gain the final A1 in part (b)].*
(b) $\frac{1}{3} \times \pi \times 4^2 \times$ (cone height) $= 335{\cdot}1 \div 2$ OR $\frac{1}{3} \times 32\pi \times$ (pyramid height) $= 335{\cdot}1 \div 2$ OR $\frac{1}{3} \times \pi \times 4^2 \times 2l/3 + \frac{1}{3} \times 32\pi \times l/3 = 335{\cdot}1$	M1	F.T. using ('their side length')^2 for 32π. Or equivalent e.g. using '2h' and 'h' (where h = pyramid height).
(cone height =) $\frac{3 \times 167{\cdot}55}{16\pi}$ or equivalent OR (pyramid height =) $\frac{3 \times 167{\cdot}55}{32\pi}$ or equivalent OR $l = \frac{3 \times 3 \times 335{\cdot}1}{32\pi + 32\pi}$ or equivalent	m1	Do not penalise approximating 32π as 100. (Pyramid height given as 5·026).
(cone height =) 10(cm) OR (pyramid height =) 5(cm)	A1	OR $l = 15$ is A2
Overall length = 15(cm)	A1 9	

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4351/01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: Mathematics In Everyday Life

FOUNDATION TIER

A.M. WEDNESDAY, 6 November 2013

1 hour 15 minutes

ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **9**.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**4**	
2.	**4**	
3.	**5**	
4.	**4**	
5.	**5**	
6.	**4**	
7.	**5**	
8.	**5**	
9.	**8**	
10.	**4**	
11.	**3**	
12.	**4**	
13.	**6**	
14.	**4**	
TOTAL MARK		

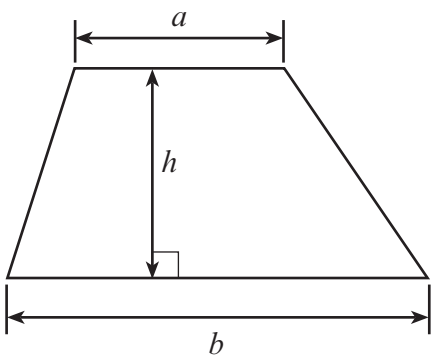
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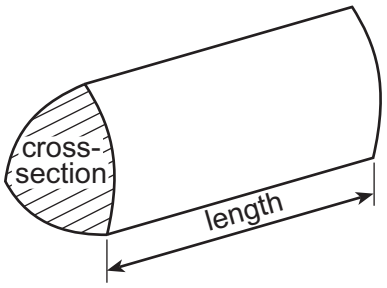
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Formula List

Area of trapezium $= \frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



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1. *(a)* The population of a country was officially recorded as,

'three million, twenty four thousand, seven hundred and fifty six'.

Write this number in figures. [1]

.....

(b) The number of people recorded as being seventy years old or over was 62 856.
Write this number correct to the nearest 1000. [1]

.....

(c) Of the 1224 people recorded as being one hundred years old or over, exactly one-third were male.

(i) How many of these 1224 people were male? [1]

.....

.....

.....

(ii) What fraction of these 1224 people were female? [1]

.....

2. Circle the quantity that is most appropriate to estimate each of the following. [4]

Weight of an orange	200 litres	200 grams	200 metres	200 seconds
Height of the Eiffel Tower	324 mm	324 cm	324 m	324 km
Floor area of a school hall	600 m^2	6 m^2	0·6 m^2	600 cm^2
Volume of a swimming pool	2000 ml	2000 m	2000 m^2	2000 m^3

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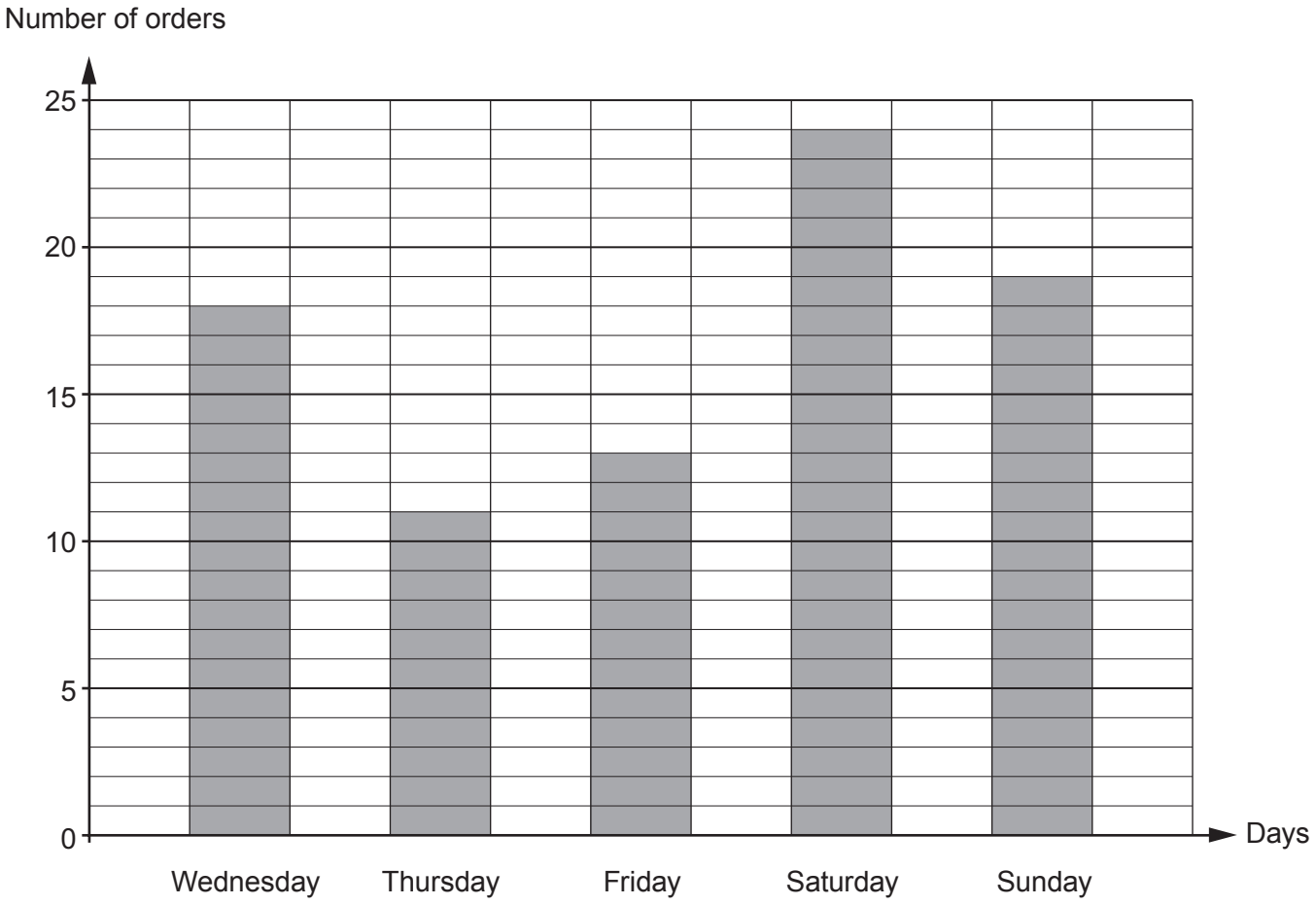
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3. A 'Food Fair' was held in a town each day from Wednesday to Sunday.

The diagram shows the number of orders a cheese-maker took on each of these days.



(a) On which day did she take the fewest orders? [1]

.....

(b) What was the total number of orders taken over the weekend (Saturday and Sunday)? [1]

.....

.....

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(c) Every order she took on Friday was worth £12.50.
What was the total value of the orders taken on Friday? [2]

.....

.....

.....

.....

(d) She took more money on the Thursday than on the Wednesday.
Explain how this could have happened. [1]

.....

.....

.....

.....

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4. The following formula was used by the organisers of a festival to calculate the parking fee for minibuses.

parking fee = number of passengers x 30p + £5

(a) How much was the parking fee for a minibus carrying 12 passengers? [2]

.....

.....

.....

(b) The parking fee for another minibus was £7.40.
How many passengers were on this minibus? [2]

.....

.....

.....

.....

.....

.....

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5. A television channel needs to fit the following four programmes between its three 'News' slots.

Programme	Time needed
Your Songs	30 minutes
Nature Trails	25 minutes
Theatre Review	20 minutes
The Comedy Slot	20 minutes

The title of each news bulletin tells you how long it lasts.

Complete the following timetable to show the order in which the four programmes can be broadcast. [5]

TIME	**PROGRAMME**
11:00 a.m.	***The 10 minute News Report.***
11:10 a.m.	.....
.....	.....
11:55 a.m.	***Your 15 minute News Update.***
.....	.....
.....	.....
1:00 p.m.	***The 10 minute News Report.***

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Turn over.

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6. Matthew wants to buy each of his six friends a box of chocolates.

Two shops are selling the identical chocolate boxes that Matthew wishes to buy.
Both shops have a special offer for customers buying these chocolates.





Calculate the difference in the amount Matthew would have to pay when buying six boxes of Yummy Chocs at these shops. [4]

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7. A vertical radio mast stands on horizontal ground. It is 45 metres tall.

A steel cable is attached to the ground at a distance of 60 metres from the base of the mast.
The other end of the steel cable is attached to the top of the radio mast.
There is no slack in the cable, so that it is straight and not curved.

(a) Make a scale drawing of the radio mast, the ground and the cable.
Use a scale of **1 cm to represent 10 metres**. [3]

(b) Using your drawing, find the actual length of the steel cable. [2]

.....

.....

.....

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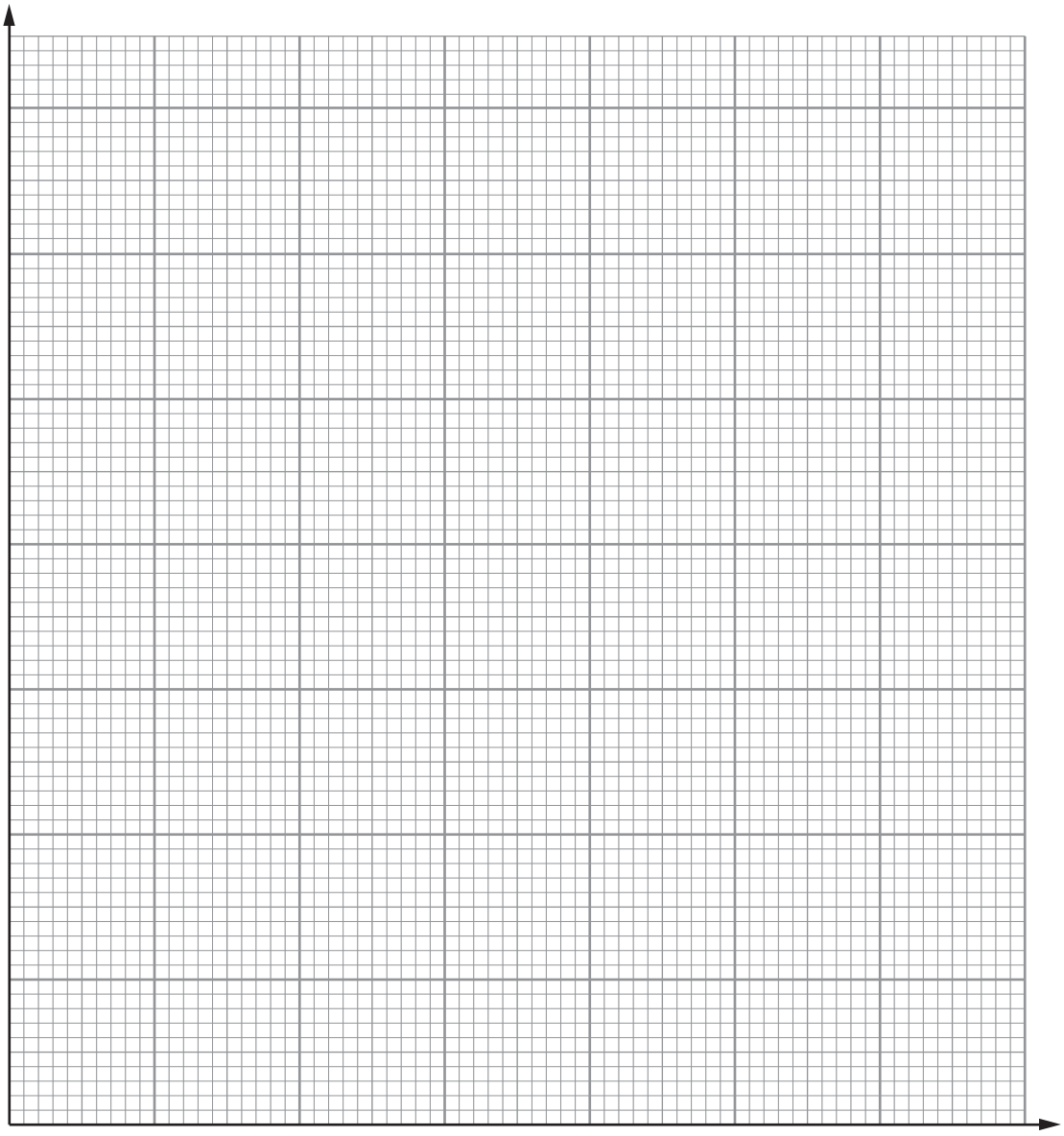
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8. A liquid is left to cool.
Its temperature is recorded every two minutes for a period of 12 minutes.
The results are summarised in the table below.

Time (minutes)	0	2	4	6	8	10	12
Temperature (°C)	70	55	42	32	25	20	17

(a) On the graph paper below, draw a curve to represent the information given in the table. [4]



(b) Use your graph to estimate the temperature of the liquid after three minutes. [1]

.....

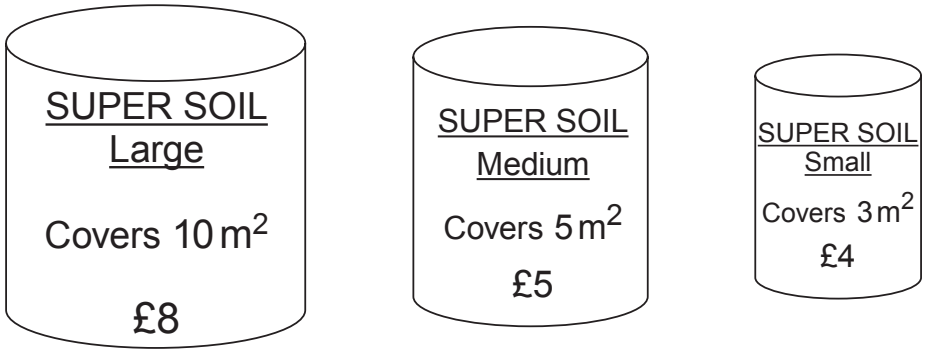
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9. *You will be assessed on the quality of your written communication in this question.*

Super Soil fertilizer is sold in three different-sized containers, as shown below.



A rectangular lawn, measuring 9 metres by 3 metres, is to be treated with this type of fertilizer.

Enough fertilizer has to be bought for the area of this lawn.
There must be enough fertilizer left over to treat an area of **at least 1 m^2** and **no more than 2 m^2**.

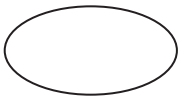
Show clearly how this could be done in **two different** ways.
Calculate the cost of the fertilizer in **both** cases. [8]

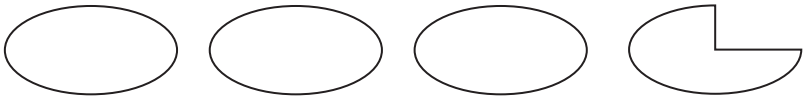
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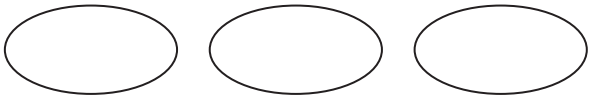
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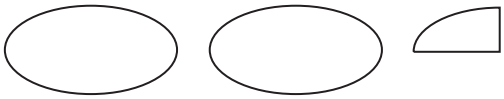
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10. A rugby team manager has illustrated how many matches the team won, drew and lost using a pictogram.

The symbol  represents 4 matches.

Won 

Drew 

Lost 

She decided that the above information would be better illustrated using a pie chart.

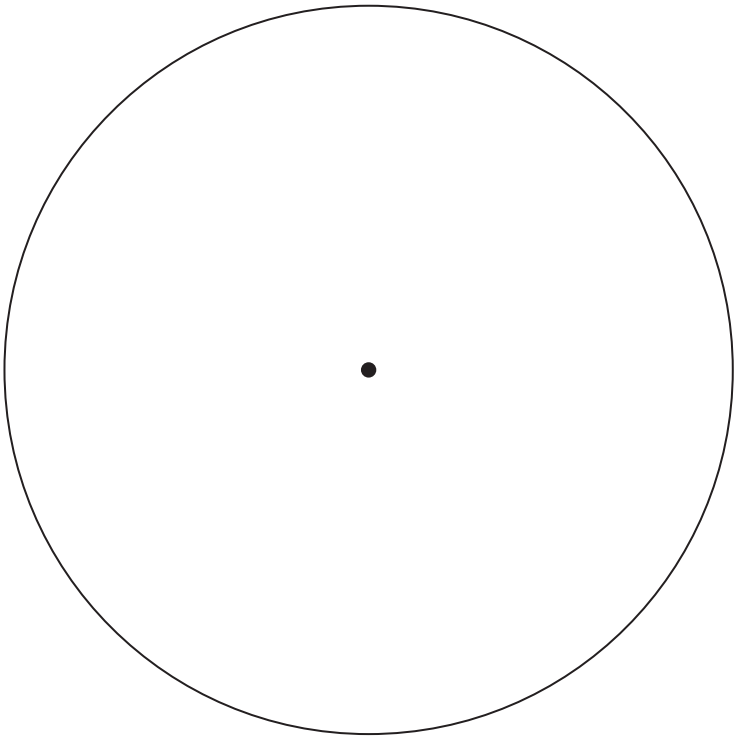
Draw a pie chart to show the same information. [4]

.....

.....

.....

.....



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11. A survey was carried out in Newcastle in the north of England.

The following two questions were asked.

Q1. *Do you think it is right to play all of England's international matches down in London, which makes it difficult for people from the north of England to attend?*

YES ☐ *NO* ☐

Q2. *How often have you visited the new Wembley stadium in London?*

1–5 times ☐ *6–10 times* ☐ *10 or more times* ☐

(a) Write down **one** criticism of the first question. [1]

.....

.....

.....

(b) Give **two** reasons why the second question is **not** suitable. [2]

Reason 1 .....

.....

.....

Reason 2 .....

.....

.....

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12. The bearing of a ship in the Irish Sea is measured from two coastal locations.
The ship is on a bearing of 040° from Moelfre and on a bearing of 335° from Hoylake.

(a) By drawing suitable lines on the diagram below, mark the position of the ship. [3]



(b) Write down the bearing of the ship from Douglas. [1]

.....

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13. An empty cylindrical tank has a base radius of three metres and is four metres high.

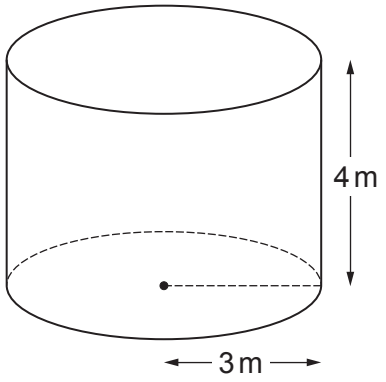


Diagram not drawn to scale

(a) Calculate the volume of this tank. [2]

(b) Water is pumped into the tank at a constant rate of 1800 litres per minute.
The pump stops automatically immediately before the tank overflows.
For how many whole minutes is water pumped into the tank? [4]

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14. Each year, Enrico's car loses 12% of its value at the start of that year.
The car was worth £17 000 when it was new.
What was its value after 3 years?
Give your answer correct to the nearest £100. [4]

END OF PAPER

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GCSE MARKING SCHEME

MATHEMATICS UNITISED

NOVEMBER 2013

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INTRODUCTION

The marking schemes which follow were those used by WJEC for the November 2013 examination in GCSE Mathematics Unitised. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

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UNIT 1 - FOUNDATION TIER

NOVEMBER 2013 UNIT 1 Foundation	Mark	Final MARK SCHEME (14/11/13) Comments (Page 1)
1. (a) 3 024 756 (b) 63 000 (c) (i) 408 (ii) ⅔ or equivalent. ISW.	B1 B1 B1 B1 4	 Accept if given in words.
2. 200 grams 324m $600m^2$ $2000m^3$	B1 B1 B1 B1 4	Accept any unambiguous indication in each case.
3. (a) Thursday. (b) 43 (c) 13 × (£)12.5(0) = (£)162.5(0) (d) Any indication that the orders taken on Thursday were worth more money. e.g. 'Prices were higher (on Thursday)' 'She gave discounts on Wednesday' 'The size of each order was smaller on Wednesday'.	B1 B1 M1 A1 E1 5	Do not accept 11. SC1 for (£)225 or (£)137.5(0) or (£)300 or (£)237.5(0) For any comment that refers to 'prices' as opposed to number of orders.
4. (a) 12 × 30(p) + (£)5 AND an attempt to multiply '12 by 30' or '12 by 0·3' AND adding 500 or 5. = (£)8.6(0) or 860(p) (b) $\frac{(£)7.4(0) - (£)5}{0.3(0)}$ or equivalent. = 8 (passengers)	 M1 A1 M1 A1 4	*Penalise consistent attempt in (a) and (b) to differentiate between driver and passengers –1once only.* Do not penalise 'mixed units' at this stage. Allow £8.60p but £860 or 8.60p is A0. For correct substitution with subtraction and division. Allow division by 30 for M1. Accept an embedded answer.
5. Correct start time for 2nd programme. First two programmes 'Nature Trails' and either 'Theatre Review' or 'The Comedy Slot'. 3rd programme starts at 12:10 Correct start time for 4th programme. Final two programmes 'Your Songs' and remaining one of 'Theatre Review' or 'The Comedy Slot'.	 B1 B1 B1 B1 B1 5	*a.m. and p.m. not required but penalise once if incorrect* **F.T.** 'their first programme'. In either order. Accept unambiguous indication. **F.T.** 'their third programme'. In either order. Accept unambiguous indication.
6. (Shop A) (£)20 (Shop B) 6 × 4 × 0·8 or equivalent. = (£)19.2(0) (Difference of) 80p or £0.8(0)	B1 M1 A1 B1 4	 F.T. their stated amounts. Units required otherwise B0. Allow £0.80p
7. (a) Accurate drawing with lines of 6cm and 4·5cm meeting at 90°. 'Steel cable' line drawn to top of mast. (b) Actual length of steel cable given (75m)	 B2 B1 B2 5	*Allow ±0·2cm and ±2°. Use overlay.* For all 3. B1 for 2 of them. Must be in correct orientation. B0 for 45m or 60m. Otherwise F.T. an unambiguous line or distance from their drawing that represents the cable × 10. Must give units. B1 if no units or incorrect units given OR length on diagram given (7·5cm). B1 for an incorrect measurement seen to be correctly multiplied by 10 AND correct units given. *Ignore sight of 75m + 60m =135m and allow B2 for the 75m.*

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NOVEMBER 2013 UNIT 1 Foundation	Mark	Final MARK SCHEME (14/11/13) Comments (Page 2)
8. (a) Labelling of BOTH axes. Uniform scale for BOTH axes. All 7 correct plots. Appropriate curve drawn. (b) Correct reading from their curve (or line).	B1 B1 P1 C1 B1 5	Units need to be given in both cases else B0. May be implied by their curve (or line). F.T. their plots if at least 4 are correct. Allow within '½ a small square'.
9. (Area of lawn) 9×3 $= 27(m^2)$	M1 A1	F.T. 'their area' (may be implied) for further B marks only if $\geq 12(m^2)$
For one correct possible choice AND its cost.	B2	B1 for a correct possible choice with no cost or an incorrect cost. B1 for an incorrect combination of at least four containers with a correct cost.
For a different correct possible choice AND its cost.	B2	B1 for a different correct possible choice with no cost or an incorrect cost. B1 for a different incorrect combination of at least four containers with a correct cost.
Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', '£', × and m^2 being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	QWC2 8	QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar.

Area (m^2)	Large	Medium	Small	Cost
28	2	1	1	(£)25
28	1	3	1	(£)27
28	0	5	1	(£)29
28	1	0	6	(£)32
28	0	2	6	(£)34
29	2	0	3	(£)28
29	1	2	3	(£)30
29	0	4	3	(£)32
29	0	1	8	(£)37

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NOVEMBER 2013 UNIT 1 Foundation	Mark	Final MARK SCHEME (14/11/13) Comments (Page 3)
10. Sight of (Won) 15, (Drew) 12 and (Lost) 9 Correct pie chart drawn (Angles are 150º, 120º and 90º)	B1 B3 4	May be implied by a correct pie chart. F.T. their amounts. *Allow ± 2°. Use overlay.* B3 for all correct and labelled. B2 for all correct but not labelled. B1 for one correct and labelled. If no marks awarded for pie chart, then award M1 for equating 1 match to the correct number of degrees (10º).
11. (a) The question is biased or leading. (b) Any two from, e.g. 'No box for those who have never been', '10 times is not exclusive', 'No time period indicated'.	B1 B2 3	Accept any statement that implies question is biased or leading. Do not accept an answer that implies the question is biased because of the location. B1 for each different reason (maximum of 2 marks).
12. (a) Bearing of 040° from Moelfre. Bearing of 335° from Hoylake. Position marked or two lines intersecting. (b) Correct three figure bearing given.	 M1 M1 A1 B1 4	*± 2° (use overlay).* Allow the M marks for dots, crosses or any unambiguous indication that the correct bearings have been offered. F.T. if at least M1 and two intersecting lines. (Lines must originate from Moelfre and Hoylake respectively and intersect at sea.) F.T. their ship's position. Allow ± 2°.
13. (a) (Volume =) $\pi \times 3^2 \times 4$ $= 113{\cdot}1\ (m^3)$ OR $36\pi\ (m^3)$ (b) Correct strategy. $\frac{113100\ (l)}{1800\ (l)}$ OR $\frac{113{\cdot}1\ (m^3)}{1{\cdot}8\ (m^3)}$ OR $\frac{113100000\ (cm^3)}{1800000\ (cm^3)}$ $= 62{\cdot}8(.....)$ OR 20π = 62(minutes)	M1 A1 S1 M1 A1 A1 6	Also $\pi \times 300^2 \times 400$ Accept answers in the range 113 m^3 to 113.2 m^3 or equivalent in cm^3 (e.g. 113 000 000) Allow S1 for sight of 'their volume' ÷ 'digits 18' F.T 'their volume' from (a). Incorrect 'compensating' conversion errors that may lead to an answer of 62·8... is M0A0A0. For truncating to nearest whole number of minutes.
14. 17000 2040 14960 1795.2(0) 13164.8(0) 1579.77(6) 11585.02(4) (£)11600	B1 M1 A1 A1 4	For the evaluation of a correct 12% OR Sight of 0·88 (6120, 10880 or 23120 implies 3× 2040 and gains B1). For attempting to find and subtract 3 different 12%. OR $17000 \times 0{\cdot}88^3$. F.T. one error. *Treat calculation for 2 or 4 years as a misread.* *Penalise an appreciation calculation –1.*

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UNIT 1 - HIGHER TIER

NOVEMBER 2013 UNIT 1 Higher	Mark	Final MARK SCHEME (14/11/13) Comments (Page 1)
1. (a) The question is biased or leading.	B1	Accept any statement that implies question is biased or leading. Do not accept an answer that implies the question is biased because of the location.
(b) Any two from, e.g. 'No box for those who have never been', '10 times is not exclusive', 'No time period indicated'.	B2 3	B1 for each different reason (maximum of 2 marks).
2. (a) Bearing of 040° from Moelfre. Bearing of 335° from Hoylake. Position marked or two lines intersecting. (b) Correct three figure bearing given.	 M1 M1 A1 B1 4	*± 2° (use overlay).* Allow the M marks for dots, crosses or any unambiguous indication that the correct bearings have been offered. F.T. if at least M1 and two intersecting lines. (Lines must originate from Moelfre and Hoylake respectively and intersect at sea.) F.T. their ship's position. Allow ± 2°.
3. 650 × 43·2 = 28080 (roubles) (Roubles left) 6840 6840 ÷ 49·5 = (£)138.18	M1 A1 B1 M1 A1 5	 F.T. 'their 28080' – 21240. F.T. 'their 6840'. £138.1818.... is A0. Mark final answer.
4. $9C + 32 \times 5 = 140 \times 5$ OR $\frac{9C}{5} = 140 - 32$ $C = \frac{140 \times 5 - 32 \times 5}{9}$ OR $(C =) \frac{140 - 32}{9} \times 5$ = 60(°C)	M1 M1 A1 3	For correct substitution in this form. Accept an embedded answer.
5. Correct method to find area of trapezium. (Trapezium area =) 34(cm^2) (Area of whole shape =) 59(cm^2) 59 × 600 ÷ 250 × (£)6 = (£)849.6(0) Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', £ and cm^2 being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	M1 A1 B1 M2 A1 QWC2 <

NOVEMBER 2013 UNIT 1 Higher	Mark	Final MARK SCHEME (14/11/13) Comments (Page 2)
6. $37 \times \frac{17}{5}$	M1	
$= 125\ ^{4}/_{5}$ or equivalent	A1	
2 hours 5 minutes 48 seconds	B1	F.T. only if time in minutes greater than 60 and includes a fraction $\neq$ ½. Accept F.T. answers to nearest second.
	3	
7. (a) (Volume =) $\pi \times 3^2 \times 4$	M1	Also $\pi \times 300^2 \times 400$
$= 113{\cdot}1\ (m^3)$ OR $36\ \pi\ (m^3)$	A1	Accept answers in the range 113 m^3 to 113.2 m^3 or equivalent in cm^3 (e.g. 113 000 000)
(b) Correct strategy.	S1	Allow S1 for sight of 'their volume' ÷ 'digits 18'
$\frac{113100\ (l)}{1800\ (l)}$ OR $\frac{113{\cdot}1\ (m^3)}{1{\cdot}8\ (m^3)}$ OR $\frac{113100000\ (cm^3)}{1800000\ (cm^3)}$	M1	F.T 'their volume' from (a). Incorrect 'compensating' conversion errors that may lead to an answer of 62·8... is M0A0A0.
$= 62{\cdot}8(.....)$ OR $20\ \pi$	A1	
$= 62$(minutes)	A1	For truncating to nearest whole number of minutes.
	6	
8. Showing 8 sheep with 1 lamb 10 sheep with 2 lambs 6 sheep with 3 lambs	B1	
$8\times1 + 10\times2 + 6\times3$ (46)	M1	F.T. their values.
$\div 24$	m1	
$= 1{\cdot}9$	A1	Must be to 1 decimal place with no errors in working. *Alternative method* $1 \times 120 + 2 \times 150 + 3 \times 90$ M1 $\div 360$ m2 $= 1{\cdot}9$ A1
	4	
9. 86% ≡ 3655	B1	Accept any indication.
(Last year) $\frac{3655}{86} \times 100$	M1	Or equivalent e.g. 3655 / 0·86.
$= 4250$	A1	
	3	
10. (a) Sight of 305(cm) or 3·05(m) AND 3·95(cm) or 0·0395(m)	B1	*The B1 may be awarded if these values are seen in (a) or in (b) and need not be of the same units.*
$\frac{305}{3{\cdot}95}$ or $\frac{3{\cdot}05}{0{\cdot}0395}$	M1	FT 'their 305', provided it is > 300 and $\leq$ 310 AND 'their 3·95', provided it is $\geq$ 3 and < 4
$= 77$	A1	77·2.... is A0.
(b) Sight of 295(cm) or 2·95(m) AND 4·05(cm) or 0·0405(m)	B1	*The B1 may be awarded if these values are seen in (a) or in (b) and need not be of the same units.*
$\frac{295}{4{\cdot}05}$ or $\frac{2{\cdot}95}{0{\cdot}0405}$	M1	FT 'their 295', provided it is $\geq$ 290 and < 300 AND 'their 4·05', provided it is > 4 and $\leq$ 5
$= 72{\cdot}8...$ AND NO	A1	*Alternative methods* $73 \times 4{\cdot}05$ M1 $= 295{\cdot}6(5)$ AND 'NO' A1 OR 295/73 M1 $= 4{\cdot}04$ AND 'NO' A1
	6	

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NOVEMBER 2013 UNIT 1 Higher	Mark	Final MARK SCHEME (14/11/13) Comments (Page 3)
11. $120 \div 3$ $= 40$ (m.p.h.) $60 \div 30$ $(= 2)$ Total time = 5 (hours)	M1 A1 M1 A1 4	 F.T. (180 – 'their 120') / (0·75 × 'their 40').
12. (a) One correct 70% calculated At least 4 attempts at repeated 70% of different values. 5 correct values 7, 4·9, 3·43, 2·40(1) and 1·68(07) All plotted correctly and not joined. (b) Some indication that the heights indicated between the bounces would not be correct.	B1 M1 A1 P1 E1 5	 Allow only arithmetical errors. All five correct (to 1dp) F.T. their values if M1 awarded. Accept plots within ½ a 'small square'. Plotting (0,10) not required but P0 if incorrect plot. Correct plots imply previous B1,M1,A1. E.g. 'there is no 1½ bounce', 'We don't know what happens in-between (bounces)'.
13. (a) (Arc AB =) $\frac{70}{360} \times 2 \times \pi \times 12$ $= 14{\cdot}6(6...)$(cm) or $\frac{14\pi}{3}$ (b) Use of $\frac{70}{360} \times \pi \times 12^2$ OR $\frac{70}{360} \times \pi \times 8^2$ $= 87{\cdot}9(6....)(m^2)$ OR $39{\cdot}0(9....)(m^2)$ OR 28π OR $112\pi/9$ (Shaded area) $\frac{70}{360} \times \pi \times 12^2 - \frac{70}{360} \times \pi \times 8^2$ $= 48{\cdot}8(7...)$ (m^2) OR $\frac{140}{9}\pi$	M1 A1 M1 A1 M1 A1 6	Allow M1 for (Major arc AB =) $\frac{290}{360} \times 2 \times \pi \times 12$ Accept answers between 14·65 and 14·7 inclusive. Allow A1 for (Major arc AB=) 60·7(3..) or $\frac{58\pi}{3}$ Accept answers between 60·7 and 60·8 inclusive for the major arc. Accept 87·9 to 88·0 inc. OR 39·0 to 39·15 inc. This implies both M marks. *(70/360 ×π × 80 is M1M1A1)* F.T. their values.
14. $\frac{2}{3} \times \pi \times R^3 + \frac{2}{3} \times \pi \times (R/5)^3 = 456$ $R^3 = \frac{456 \times 125 \times 3}{2 \times \pi \times 126}$ or equivalent $= 216$ (Radius =) 6(m)	M2 A1 A1 A1 5	M1 if $R^3/5$ is used. Allow M1 if 4/3 used instead of ⅔. F.T. if M1 awarded. F.T. 'their R^3' if at least M1 awarded. Correct to 1dp. SC1 for an answer of 6·(01..) found by using large hemisphere alone. *Note use of r for smaller radius* *$\frac{2}{3} \times \pi \times r^3 + \frac{2}{3} \times \pi \times (5r)^3 = 456$* *M2* *$r^3 = \frac{456 \times 3}{2 \times \pi \times 126}$ or equivalent* *A1* *$= 1{\cdot}7279...$* *A1* *$(5 \times r) = 6(m)$* *A1* *Mark accordingly, but penalise premature approx -1.*

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Surname	Centre Number	Candidate Number
Other Names		0

WJEC CBAC

GCSE

4351/01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: Mathematics in Everyday Life
FOUNDATION TIER

A.M. TUESDAY, 11 June 2013

$1\frac{1}{4}$ hours

ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **1**.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	**6**	
2	**4**	
3	**4**	
4	**2**	
5	**6**	
6	**3**	
7	**5**	
8	**2**	
9	**5**	
10	**8**	
11	**6**	
12	**5**	
13	**3**	
14	**2**	
15	**4**	
TOTAL MARK		

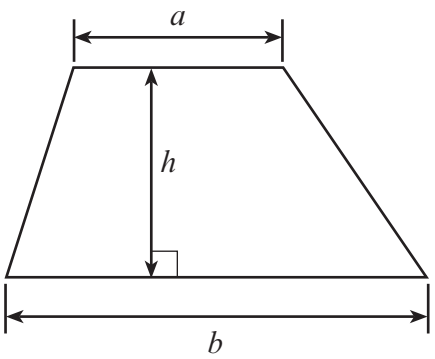
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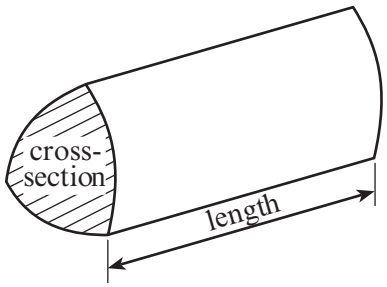
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Formula List

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



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1. *You will be assessed on the quality of your written communication in this question.*

Sharon has two gift vouchers which she uses when buying items in a store.
One voucher is worth £15 and the other voucher is worth £20.

She buys a scarf for £30 and two bottles of shampoo at £3.99 each.

How much extra will she have to pay in cash if she uses both her vouchers when paying her total bill?

You must show all your working.

.....

.....

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.....

.....

[6]

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Turn over.

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2. The diagram shows a number of cubes forming a solid shape.
The edges of each cube are 1 metre in length.

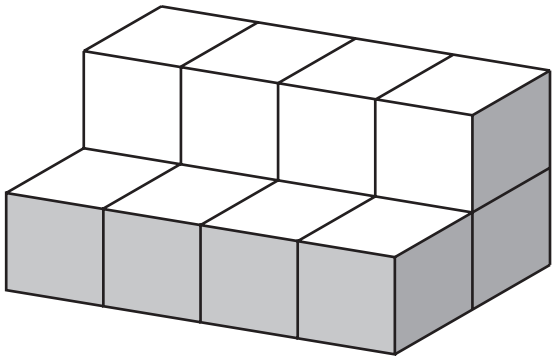


Diagram not drawn to scale

(a) What is the volume of the shape? You must give the units of your answer.

.....

.....

[2]

(b) The **two** ends of the shape and the front of the bottom row are painted grey as shown.
What is the area that has been painted? You must give the units of your answer.

.....

.....

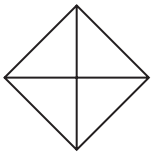
[2]

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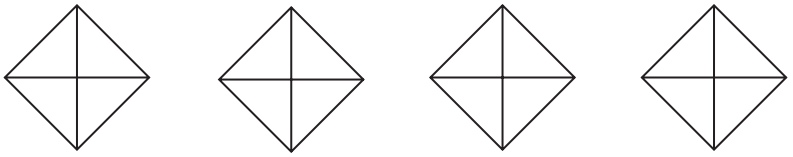
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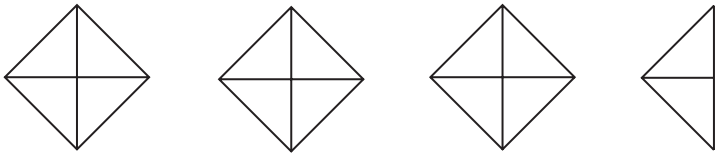
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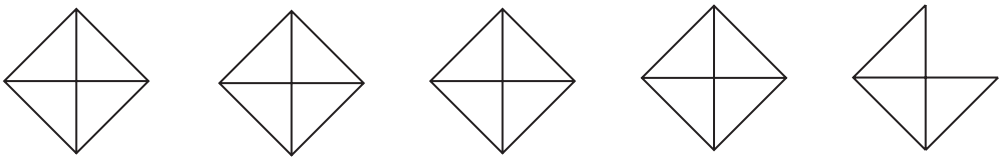
3. The owner of a cafe recorded how many lunchtime meals he served over a period of five days. He displayed the results using a pictogram

with  representing 20 meals.

The results for the first three days are shown below.

Monday 

Tuesday 

Wednesday 

Thursday

(a) How many meals were served on Monday?

.....

[1]

(b) How many meals were served on Wednesday?

.....

[1]

(c) On Thursday, 50 meals were served. Complete the pictogram for Thursday.

[1]

(d) On Friday, he served 62 meals. Explain why the pictogram scale that has been used is not really suitable for showing this.

.....

.....

[1]

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Turn over.

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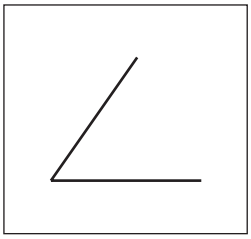
4. A company's logo is a simple  shape.

The logo can be of any size but

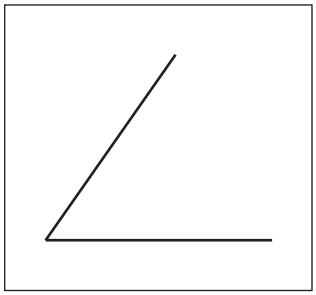
- the two lines **must** be of equal length,
- the angle between the two lines **must** be 55^{o}.

Complete the logo for the poster shown as size C.

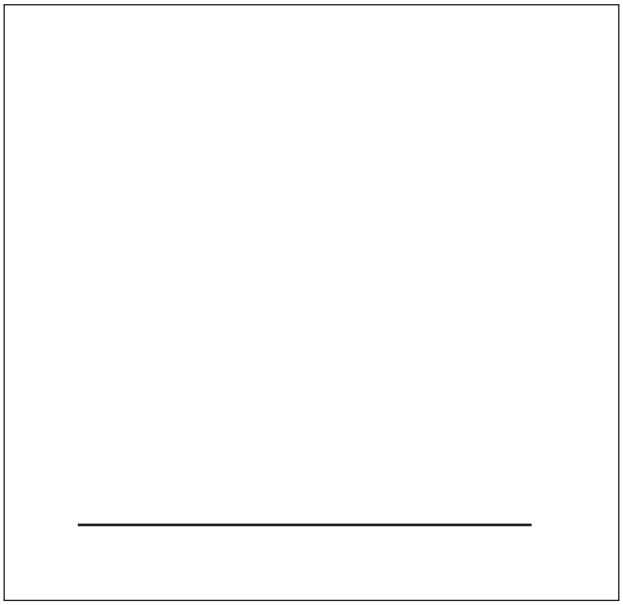
Size A



Size B



Size C



[2]

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5. A landscape gardener is asked by the owner of a caravan park to plant some trees on the site. To work out the total bill, the gardener uses the formula

total bill = time taken in hours × £10 + total cost of the trees.

The gardener bought 24 trees at a price of £5 each.
It took the gardener a quarter of an hour to plant each tree.
Calculate the total bill.

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[6]

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6. Mr and Mrs Khan are beginning to think about their holiday plans for next year.
So far they have decided that

- the holiday will be in May or in September,
- it will be in the UK or in Ireland,
- it will be a single location holiday or a touring holiday.

Complete the table below to show **all** the possible combinations they might finally choose.
One of the possible combinations has been given for you.

Date	Destination	Type
May	UK	Single location

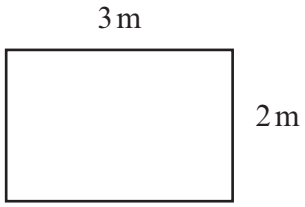
[3]

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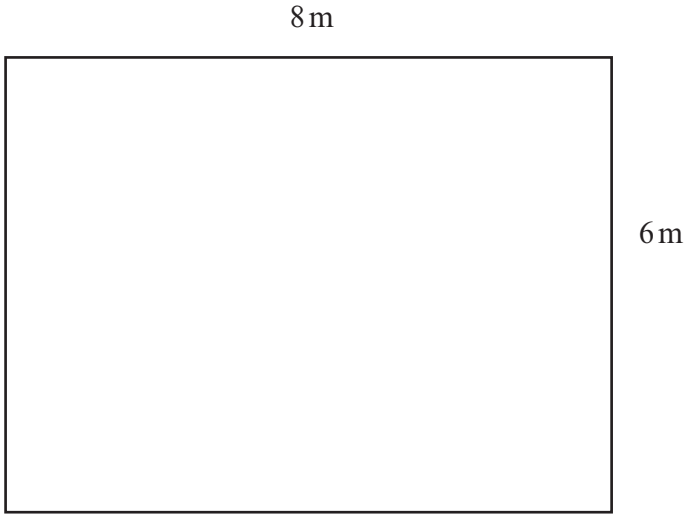
Examiner only

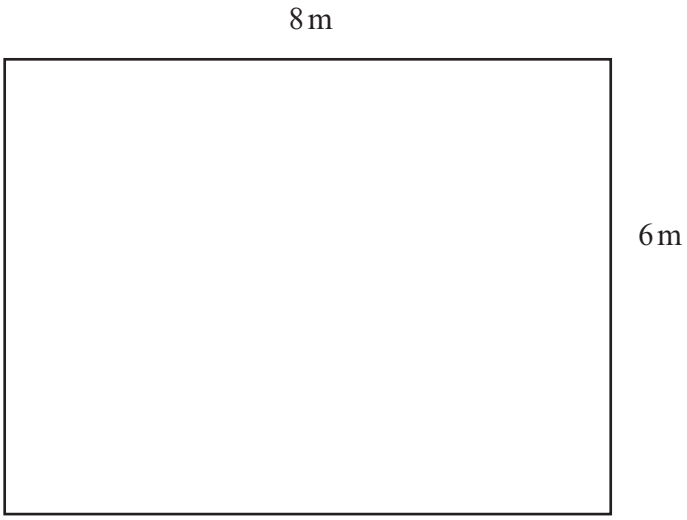
7. Rectangular tiles each measure 3 metres by 2 metres.



Eight of these tiles are used to completely cover a rectangular floor measuring 8 metres by 6 metres.
No tiles are cut.

By sketching, demonstrate two **different ways** that this can be done on the diagrams below.





[5]

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Turn over.

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8. *(a)* Write 9·577 correct to two decimal places.

.....

[1]

(b) Joan is the final competitor in a long jump competition.
Her best jump so far is 6 metres. She has one jump left.

The leading jumper has jumped a distance of 6·3 metres.

Joan says,

"If I jump 4 cm further than my best jump so far, then I'll win".

Is Joan correct or not? You must explain your answer.

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[1]

9. The cost of hiring a concrete mixer is £12 for the first day and then £8 for each additional day.
Alan paid £44 for hiring this concrete mixer.
For how many days did he hire the concrete mixer?

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[5]

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10. Amira and Sian travelled by ship to Ireland for a five-day holiday.

(a) Amira exchanged £750 into euros before departing.
The exchange rate was £1 = 1.20 euros.
How many euros did Amira receive?

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[2]

(b) On the first night, they stayed at a hotel in Dublin.
Amira had booked online before departing and had paid £85.
Sian paid 96 euros at the hotel.
Using the same exchange rate, calculate the difference **in pounds** between the amounts they each paid.

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[3]

(c) The hotel was 3 km from the port.

(i) How far is this in metres?

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[1]

(ii) How far is this in miles? Give your answer correct to the nearest mile.

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[2]

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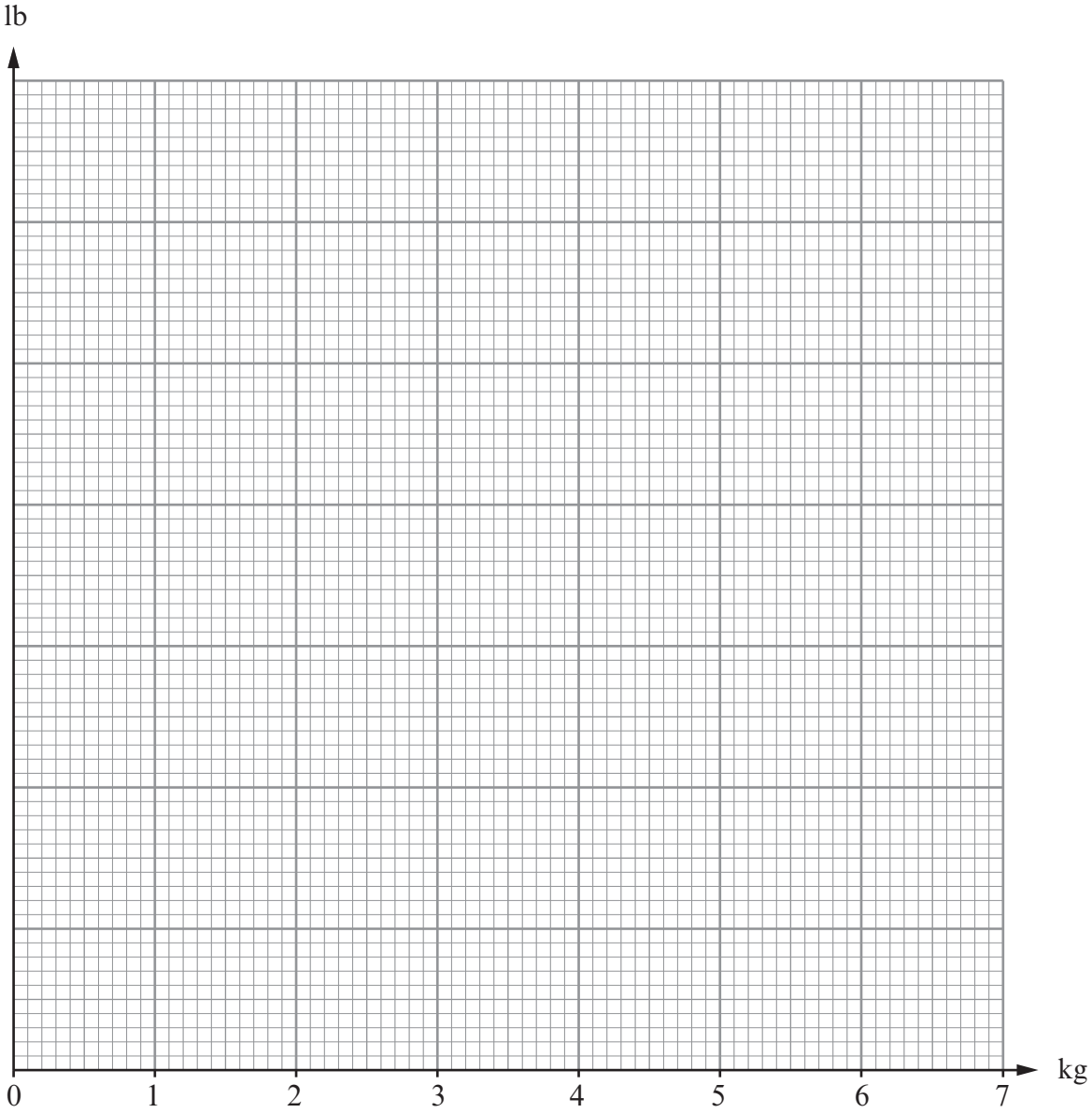
Examiner only

11. The following two pieces of information, given in both kilograms (kg) and pounds (lb), were seen in a cookery magazine.

Use 5 kg (11 lb) of apples. Wash and peel them.

Use 2 lb (0·9 kg) of sugar. Warm the sugar before use.

(a) Use the information to draw a conversion graph between kilograms and pounds.



[3]

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(b) A person weighs 10 stone. (1 stone = 14 lb.)

Use your graph to estimate the weight of this person in kilograms.
Remember to show the method you have used.

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[3]

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12. An electricity bill, for a period of three months, showed that 1380 units had been used at a cost of 12·3 pence per unit.
The standing charge for this period was £13.86.
VAT at 5% is payable on the total cost of the units used and the standing charge.

Calculate the total amount to be paid.

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[5]

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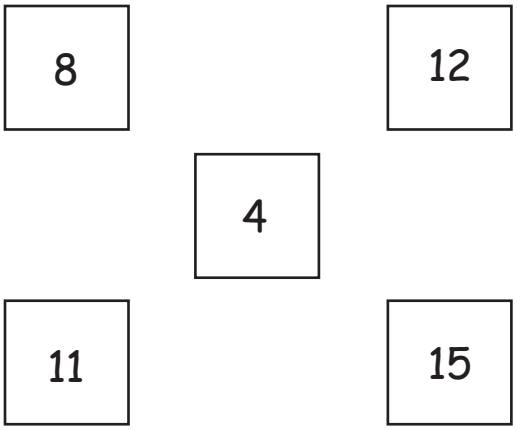
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13. Matthew is playing a game that uses numbered tiles.

The game involves working out the range and mean of the numbers on five tiles.

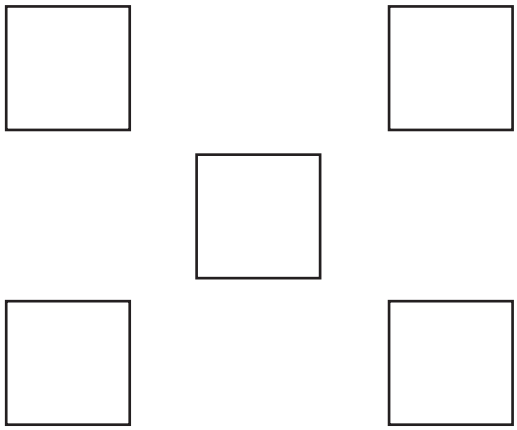
Matthew has these five tiles.



With his final move in a game, Matthew must replace **exactly two** of his tiles with two different tiles.

To win the game he must keep the **same range** as above but **increase the mean by 1**.

Fill in the numbers on the tiles below to show the three tiles he has kept, and the new numbers on the two tiles he has changed, if he is to win.



For working:

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[3]

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14. A new car, bought for £28 000, was sold one year later for £22 960.

Calculate the percentage depreciation.

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[2]

15. Nicola used her car to travel from her home to her friend's house.
It took her two and a half hours, driving at an average speed of 30 mph.

Her return journey home, along the same route, took three hours.

Calculate her average speed on her journey home.

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[4]

END OF PAPER

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Question number	**Additional page, if required. Write the question numbers in the left-hand margin.**

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GCSE MARKING SCHEME

MATHEMATICS - UNITISED

SUMMER 2013

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INTRODUCTION

The marking schemes which follow were those used by WJEC for the Summer 2013 examination in GCSE MATHEMATICS - UNITISED. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

	Page
Unit 1 - Foundation Tier	1
Unit 1 - Higher Tier	4
Unit 2 - Foundation Tier	7
Unit 2 - Higher Tier	10
Unit 3 - Foundation Tier	12
Unit 3 - Higher Tier	15

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GCSE MATHEMATICS - UNITISED - MARK SCHEME

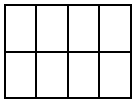
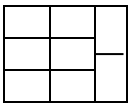
SUMMER 2013

UNIT 1 - FOUNDATION TIER

JUNE 2013 UNIT 1 Foundation	✓	Mark	FINAL MARK SCHEME Comments
1. (Scarf £30.00) (2 bottles of shampoo at £3.99 each) (£) 7.98 (+) (Total bill) £37.98	V V	B1 B1	F.T. £30 + 'their £7.98'. (£)37.98 implies B1B1.
(Total value of vouchers) (£)35(.00)	V	B1	
(Extra cash required £37.98 – £35.00 =) (£)2.98	V	B1	F.T. 'their £37.98' – 'their £35'. *Alternative methods* *(£)35 – (£)30 =(£)5 OR (£)35 – (£)7.98 = (£)27.02* *(£)7.98 – (£)5 =(£)2.98 (£)30 – (£)27.02 = (£)2.98* *B1 for (£)35, B1 for (£)7.98, B1 for (£)5 or (£)27.02 and B1 for (£)2.98.*
Look for • spelling • clarity of text explanations and correct units shown • the use of notation (watch for the use of '=', '+' and '–' being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	V V	QWC 2	QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar. <u>An unsupported answer is QWC0.</u>
2. (a) 12 m^3		B1 U1	Independent of the B1
2. (b) 10 m^2		B1 U1	Independent of the B1
3.(a) 80		B1	
3.(b) 95		B1	
3.(c) 'Two and a half' symbols drawn.		B1	Ignore size and poor diagrams if intention is clear.
3.(d) Explanations such as e.g. 'the symbol is only suited for multiples of 5', '62 is not in the five times table', '2 would be difficult to show'.		B1	Accept equivalent statements BUT there must be a consideration of the 62 in some way e.g. Allow 'It (only) goes up in 5s' for B1, but B0 for 'each triangle is worth 5'.
4. A line of length 6cm drawn. An angle of 55° drawn at correct position.		 B1 B1	***Use overlay.*** Allow ± 0·2cm. Allow ± 2°.

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JUNE 2013 UNIT 1 Foundation	✓	Mark	FINAL MARK SCHEME Comments
5. (Cost of trees =) 24 × (£)5 = (£)120 (Time taken =) 24 × ¼ = 6(hours) (Total bill =) 6 × (£)10 + (£)120 = (£)180	V V V V V V	M1 A1 M1 A1 M1 A1	24 × 15 = 360 is M0A0 but allow F.T. of 360 for final M1A1. F.T. 'their time taken' BUT not 15 or 0·25 or 0·15 or 24. F.T 'their cost of trees' BUT not (£)5 or (£)24.
6. (May UK Single) May UK Touring May I Single May I Touring Sept UK Single Sept UK Touring Sept I Single Sept I Touring		B3	Accept any unambiguous indication for month, destination and type. Do not credit or penalise repeated combinations For all 7 correct. B2 for 5 or 6 correct. B1 for 3 or 4 correct.
7.  	V V V V V	B2 B3	*If both of the two <u>different</u> ways shown are of the sort which could gain a B3 then allow B3in the first instance and B2 for the second one.* B1 for strategy of 2+2+2+2 = 8 OR 3+3 = 6. BUT B0 if more than 8 tiles shown. B0 if any inconsistent matching of tile sides (e.g. implying 2m = 3m). Or equivalent. B1 for strategy 2+2+2 = 6. B1 for strategy 3+3+2 = 8. BUT B0 if more than 8 tiles shown. B0 if any inconsistent matching of tile sides (e.g. implying 2m = 3m).
8.(a) 9·58		B1	
8.(b) A statement that recognises that 6·3m = 6m 30cm or 6m + 4cm = 6.04 metres e.g. 'No she must increase her jump by more than 30cm' or 'her jump would be only 6.04 metres'.		B1	Accept 'She must jump 31cm further'. Also allow 'She must jump 40cm further' as an indication that the candidate realises that 100cm = 1 m.
9. (£)44 – (£)12 = (£)32 32 ÷ 8 = 4 (Hired mixer for) 5(days)	V V V V V	M1 A1 M1 A1 A1	F.T. 'their 32'. F.T. 'their 4' + 1. SC1 for 44/8 = 5½ (or 6) days SC2 for 44/8 = 5½ (or 6) days , therefore 6½ (or 7)days
10. (a) 750 × 1·2(0) = 900 (euros)		M1 A1	
10(b) 96 ÷ 1·2(0) = (£)80 (A difference of) (£)5		M1 A1 A1	OR (85 × 1·2) – 96 M1 (6euros gain M1) ÷ 1·2 m1 (£) 5 A1
10 (c)(i) 3000 (metres)		B1	
10(c) (ii) 3 × 5/8 (= 15/8) 2 (miles)		M1 A1	An answer of 2(miles) clearly found from an incorrect method e.g. 3 × ½ = 1½ ≈ 2(miles) is M0A0. For this question allow 1·5km ≈ 1mile so 3km ≈ 2miles.

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JUNE 2013 UNIT 1 Foundation	✓	Mark	FINAL MARK SCHEME Comments
Ribbon marking for 11(a) and 11(b). 11. (a) Uniform scale on vertical axis.		B1	*P0,L0 if no attempt at uniform scaling.*
Plotting at least two correct points.		P1	± '½ a small square'. The origin may be one of the points.
Correct line drawn.		L1	Correct line implies P1L1.
(b) (10 stone =) 140 (lbs)		B1	For sight of 140. It may be implied in further work.
Any correct strategy, e.g. 14 times their value at 10 lbs.		M1	Accept 10 times their value at 14lbs, if line drawn extends that far.
A correct answer <u>for their line</u>.		A1	F.T. their line, OR B1, M1, A1 for answers between 63(kg) and 64(kg) inclusive.
12. (Cost of units) 1380 × 12·3	V	M1	
(£)169.74 or 16974(p)	V	A1	Allow £169.74p but A0 for £16974 or 169.74p.
(Cost of units and std.chg.) (£)183.6(0) or 18360(p)	V	B1	F.T. 'their cost of units' + £13.86. However, B0 if 'mixed units' used after award of A1.
(£)183.60 × 1·05 OR (£)183.60 + (£)183.60 × 0·05	V	M1	F.T. their total cost. Accept working in pence.
= £192.78 or 19278p	V	A1	Units must be given or clearly implied from previous work.
13.			B0,B0,B0 if fewer than five numbers shown.
Showing only two numbers changed.	V	B1	
Numbers give a range of 11.	V	B1	B0 if using the same five numbers.
Numbers give a mean of 11.	V	B1	
14. <u>28000 – 22960</u> (× 100) 28000		M1	
= 18(%)		A1	
15. (Distance =) 2½ × 30	V	M1	Allow M1 for 2·3(0) × 30.
= 75 (miles)	V	A1	C.A.O.
(Average speed =) 75 ÷ 3	V	M1	F.T. 'their 75'.
= 25 (mph)	V	A1	

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JUNE 2013 UNIT 1 Higher	✓	Mark	FINAL MARK SCHEME Comments
1. (Cost of units) $1380 \times 12{\cdot}3$ (£)169.74 or 16974(p)	V V	M1 A1	Allow £169.74p but B0 for £16974 or 169.74p.
(Cost of units and std.chg.) (£)183.6(0) or 18360(p)	V	B1	F.T. 'their cost of units' + £13.86. However, B0 if 'mixed units' used after award of A1.
(£)183.60 × 1·05 OR (£)183.60 + (£)183.60 × 0·05 = £192.78 or 19278p	V V	M1 A1	F.T. their total cost. Accept working in pence. Units must be given or clearly implied from previous work.
Ribbon marking for 2(a) and 2(b). 2. (a) Uniform scale on vertical axis.		B1	*P0,L0 if no attempt at uniform scaling.*
Plotting at least two correct points.		P1	± '½ a small square'. The origin may be one of the points.
Correct line drawn.		L1	Correct line implies P1L1.
(b) (10 stone =) 140 (lbs)		B1	For sight of 140. It may be implied in further work.
Any correct strategy, e.g. 14 times their value at 10 lbs.		M1	Accept 10 times their value at 14lbs, if line drawn extends that far.
A correct answer <u>for their line</u>.		A1	F.T. their line, OR B1, M1, A1 for answers between 63(kg) and 64(kg) inclusive.
3.			B0,B0,B0 if fewer than five numbers shown.
Showing only two numbers changed.	V	B1	
Numbers give a range of 11.	V	B1	B0 if using the same five numbers.
Numbers give a mean of 11.	V	B1	
4. Sight of 360 / 18 or $20^{(\circ)}$ OR sight of $100^{(o)}$		B1	Clear incorrect methods such as 18/4 = 4·5 so 5 wins is B0,M0,A0.
(Spanish winners =) 100 / 20 OR 18 × 100/360 = 5 (wins)		M1 A1	*Allow SC2 for an answer of 4(wins) when 80° is seen to be used instead of 100°.*
5. Sight of $\frac{(100 + 40)}{2} \times BC$ or equivalent	V	B1	For a correct expression for the total area of ABCD in terms of BC. F.T. their area only if in terms of BC and is dimensionally correct.
$\frac{(100 + 40)}{2} \times BC = 3500$	V	M1	For equating their expression for area, <u>in terms of BC</u>, with 3500.
$BC = 2 \times 3500 / 140$ = 50(m)	V V	A1 A1	Further F.T. only if of equivalent difficulty
6. (Distance =) 2½ × 30 = 75 (miles)	V V	M1 A1	Allow M1 for 2·3(0) × 30. C.A.O.
(Average speed =) 75 ÷ 3 = 25 (mph)	V V	M1 A1	F.T. 'their 75'.
7. (a) (i) There is no scale on the 'number of squirrels' axis.		B1	Accept equivalent valid statement.
(ii) 40 shown on vertical axis **and** a correct graph that shows 'consecutive doubling'.		B1	
7(b) States that 'interim' readings between consecutive noon times are not correct.		B1	Accept statements that imply this, e.g. 'temperatures at midnights are wrong', 'only accurate at 12pm.'

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JUNE 2013 UNIT 1 Higher	✓	Marks	FINAL MARK SCHEME Comments
8. 12000 480 12480 499.2(0) 12979.2(0) 519.16(8) 13498.36(8) OR 480, 499.2(0) and 519.16(8) (Compound interest earned =) (£)1498.37	V V V V	B1 M1 A1 A1	For the evaluation of a correct 4% OR Sight of 1·04 (1440 implies 3× 480 and gains B1). For attempting to find 3 different 4%. OR B1 M1 for $12000 \times 1{\cdot}04^3$. F.T. one error. Accept (£)1498.36 A0 for (£)1498.368 *Treat calculation for 2 or 4 years as a misread.* *Penalise a depreciation calculation –1.*
9. (Greatest length of handrail =) 6005 (cm) (Least length of metal strip=) 39·5(cm) (Minimum number of strips required) 6005 / 39·5 = 152·02(....) (Minimum required) 153.	V V V V V	B1 B1 M1 A1 B1	For sight of 6005 or 60·05(m). For sight of 39·5 or 0·395(m). Or equivalent. Must use same units of length. F.T. their values only if 'rail' > 6000 and 'strip' < 40. F.T. 'their 152·02..' only if a division 'Path / Strip' seen and an attempt to use the same units.
Look for • spelling • clarity of text explanations and correct units shown • the use of notation (watch for the use of '=' and '÷' being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	 V V	QWC2	QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar. <u>An unsupported answer is QWC0.</u>
10(a) $20 \times \frac{600}{500} \times \frac{1}{3}$ = 8 (min) or 480 seconds.		M1 M1 A1	Or equivalent. Or equivalent. C.A.O. *For partial work for old photocopier* *Award M1 for stating '600 sheets in 24 min'.* *For partial work for new photocopier* *Award M1 for stating '500 sheets in 20/3 or 6·66.. min'.*
10(b) 7⅓ ISW		B2	Accept $7^{15}/_{45}$ or $7^{3}/_{9}$. B1 for sight of 33/5 × 10/9 or 22/3 or equivalent. B0 for 7·3..... B0 for $7^{3}/_{10.}$

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JUNE 2013 UNIT 1 Higher	✓	Marks	FINAL MARK SCHEME Comments
11. Use of 1·2 × 1·26	V	M1	*These values may be used in conjunction with the*
= 1·512	V	A1	*candidate's choice of initial sum of pounds.*
			F.T. only if M1 gained.
Sight of ('loss of') 0·068	V	B1	*Alternative method for final three marks.*
Use of $\frac{1{\cdot}58 - 1{\cdot}512}{1{\cdot}58}$ (× 100)	V	M1	*1 – 1·512 (×100) M1*
			1·58
= 4·3(03..)(%) ISW	V	A1	*Sight of 0·957... B1* *allow 0·96 for B1*
			4·3(03..)(%) ISW A1 but 4(%) is then A0
12. 450 × 4/3		M1	Sight of 600 gains M1.
× 4/3		M1	
= 800 (acres)		A1	C.A.O.
13. (a) $\frac{60}{360} \times \pi \times 80^2$		M1	
= 3351 (m^2)		A1	Accept answers between 3349 and 3353 inclusive.
13. (b) $\frac{60}{360} \times 2 \times \pi \times 80$	V	M1	
= 83·7(77..)(m)	V	A1	Accept answers between 83·70 and 83·85 inclusive.
(Length of rope =) 83·8 + 80 + 80	V	M1	F.T. 'their derived 83·8'.
= 243·8 (m)	V	A1	
14. (Volume of cone) $\frac{1}{3} \times \pi \times 3^2 \times h$	V	B1	Correctly substituted (with their 'height' notation)
			Implied by 3πh or 9·42*h* to 9·43*h* (also 18·84*h* to 18·86*h*)
(Volume of sphere) 36π	V	B1	Implied by 113·0 to 113·2 inclusive.
(Total volume) 6π*h* + 36π or 18·85*h* + 113.1	V	B1	For F.T. 'cone volume' must be in terms of *h*. F.T. 2 × 'their cone volume' + 'their sphere volume'.
6π*h* + 36π = 245	V	M1	F.T. 'their total volume' only if it is expressed as two terms one of which contains '*h*'.
$h = \frac{245 - 36\pi}{6\pi}$	V	A1	Correctly making *h* the subject of their equation.
= 7(cm)	V	A1	
(Overall length =) 20(cm)	V	A1 (7)	F.T. 2 × 'their 7' + 6.
Alternative method			
(Volume of cone) $\frac{1}{3} \times \pi \times 3^2 \times h$	V	B1	Correctly substituted (with their 'height' notation) Implied by 3πh or 9·42*h* to 9·43*h* (also 18·84*h* to 18·86*h*)
(Volume of sphere) 36π	V	B1	Implied by 113·0 to 113·2 inclusive.
(Total volume of **2** cones) 131·9	V	B1	Must be TWO cones F.T. 245 – 'their sphere volume'.
$\frac{1}{3} \times \pi \times 3^2 \times h = 66$ or $2 \times \frac{1}{3} \times \pi \times 3^2 \times h = 131.9$	V	M1	Implied by 9·42*h* = 66 or 18·85*h* = 131· 9 F.T. 'their 66' and 'their 9·42*h* '.
$h = \frac{131{\cdot}9}{18{\cdot}85}$ or $\frac{66}{9{\cdot}42}$	V	A1	
= 7(cm)	V	A1	
(Overall length =) 20(cm)	V	A1 (7)	F.T. 2 × 'their 7' + 6.

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Surname	Centre Number	Candidate Number
Other Names		0

WJEC CBAC

GCSE

4351/01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: Mathematics in Everyday Life
FOUNDATION TIER

A.M. FRIDAY, 11 January 2013

$1\frac{1}{4}$ hours

ADDITIONAL MATERIALS

A calculator will be required for this paper.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **9**.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	**6**	
2	**2**	
3	**3**	
4	**4**	
5	**4**	
6	**3**	
7	**5**	
8	**3**	
9	**8**	
10	**3**	
11	**5**	
12	**3**	
13	**5**	
14	**3**	
15	**4**	
16	**4**	
TOTAL MARK		

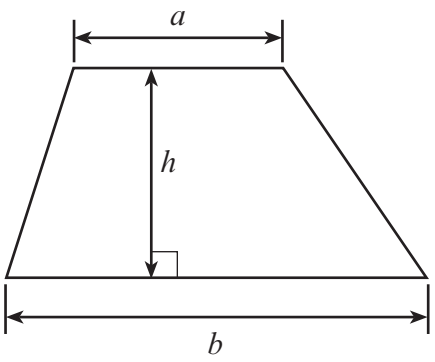
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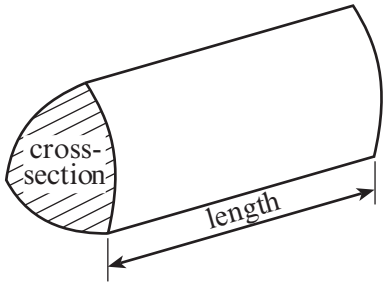
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Formula List

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



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1. *(a)* A stadium announcer is given information on attendance in both words and figures to make sure he reads them correctly.

For example:

'The attendance at last week's match was sixty six thousand, five hundred and seventy

(66 570).'

Fill in the blanks for the following two pieces of information.

(i) 'Today's attendance is seventy two thousand and thirty four

(.....).'

[1]

(ii) 'The total attendance for our home matches so far this season has been

.....

.....

(540 207).'

[1]

(b) 10% of the 66 570 people who attended last week's match bought a programme. Each programme cost £3.

Calculate how much money was collected from the sale of the programmes. Give your answer correct to the nearest £1000.

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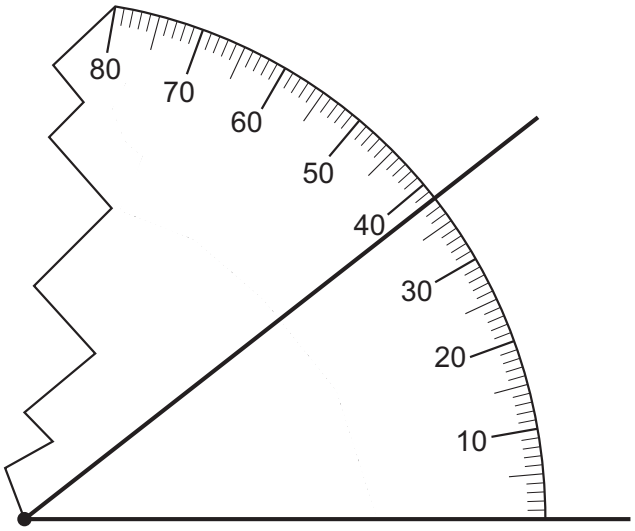
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2. *(a)* The diagram below shows an angle measurer that has been placed to measure the size of an angle.
What is the size of the angle that is being measured?

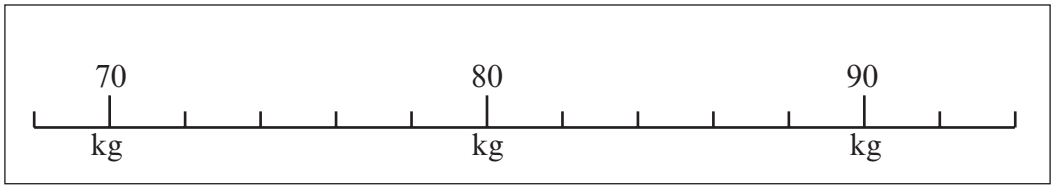


Size of angle = ... O

[1]

(b) A person weighs 84 kg.

Draw a pointer (↓) on the scale shown below to indicate this weight.



[1]

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3. Three companies have three different bonus payment schemes for their sales team.

- Company A offers a bonus payment equal to **25%** of all sales made
- Company B offers a bonus payment equal to $\frac{\mathbf{3}}{\mathbf{10}}$ of all sales made
- Company C offers a bonus payment equal to **0·2** times all sales made

Which company offers the best bonus payment scheme for their sales team?
You must show all your working.

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[3]

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4. As part of a nature study, 30 frogs found near a pond were weighed.
Their weights (to the nearest gram) are recorded below.

112	140	87	155	117	148	136	103	141	93
147	172	129	148	96	102	161	145	106	146
111	122	148	88	119	170	83	133	139	97

Using **equal** class intervals, complete the following table.

Weight (g)	75 to 99	100 to 124	..... to	150 to 174
Tally	𝍸 /			
Frequency	6			

[4]

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5. The formula for the cost of buying a fridge-freezer on credit is

Cost of buying a fridge-freezer = 24 × Monthly payment + Deposit

(a) Find the **Cost of buying a fridge-freezer** when the **Monthly payment** is £35 and the **Deposit** is £70.

.....

.....

.....

.....

[2]

(b) Find the **Monthly payment** when the **Cost of buying a fridge-freezer** is £530 and the **Deposit** is £50.

.....

.....

.....

.....

[2]

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6. Alice asked five of her friends how much their pet dogs weighed.
She received the following replies.

Hi Alice,
Buster
weighs 8·72 kg.
Love,
Mary

Hello Alice,
Smot *weighs 9 kg 624 g*
Sunita

Alice,
Rover weighs
8·527 kg.
See you,
David

Alice,
Just weighed **Nell** for you.
She is 10·6 kg.
See you next week,
Tina

Dear Alice,
Finally managed
to weigh **Peg**.
She is 7964 grams.
All the best,
Yousef

In the table below, list the names of the dogs in order of weight, with the name of the heaviest dog at the top, in position 1.

The name of the lightest dog should be in position 5.

To check your answer, you may want to write down the weights they gave in their replies to Alice.

Position	Name of Dog	Weight
1		
2		
3		
4		
5		

[3]

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7. Steve is training for a 1500 metre race.

He has timed ten practice runs.
He has recorded each of his times as the number of seconds over or under 4 minutes.
For example,

- a time of 4 minutes 6 seconds was recorded as +6.
- a time of 3 minutes 58 seconds was recorded as –2.

His record was as follows.

+2 +7 –3 –5 +8 –3 –13 0 –2 –10

(a) How many of his practice runs were completed in less than four minutes?

.....

[1]

(b) What was his slowest time?

..... minutes ..... seconds

[1]

(c) What was his fastest time?

..... minutes ..... seconds

[1]

(d) What was the difference in time between his fastest and slowest practice runs?

.....

.....

[2]

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8. Two batsmen, Adam and Ben, have both played 20 matches for their team.

A record of how many runs they scored in each match is summarised below.

	Number of runs scored	0 - 19	20 - 39	40 - 59	60 - 79	80 - 99
Number of matches played	Adam	0	0	12	5	3
	Ben	3	8	7	2	0

Explain clearly how it is possible for the range of the number of runs scored by Adam to be greater than the range of the number of runs scored by Ben.

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[3]

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9. *You will be assessed on the quality of your written communication in this question.*

When Liam has a bath he uses 150 litres of water.
His sister Tina claims that when she has a shower she uses 40% less water than Liam uses when he has a bath.

To test this claim, Tina made the following two observations.

- 1 litre of water comes out of the shower head every 10 seconds
- Tina spends 15 minutes in the shower.

Is Tina's claim correct?
You must show all your working.

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[8]

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Examiner only

10. A company registers the number of complaints it receives about its products.
They have done this each year for a period of 3 years.

They received 400 complaints in the first year.

Each year, the number of complaints reduced by $\frac{1}{10}$ of the number received the previous year.

How many complaints did the company receive in the third year?

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[3]

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Examiner only

11. A local council charges businesses and companies a weekly rent to use a room in one of its buildings.
The weekly rent they charge is £5 per square metre of floor area.

What would be the weekly rent for using a room that has the floor plan shown below?

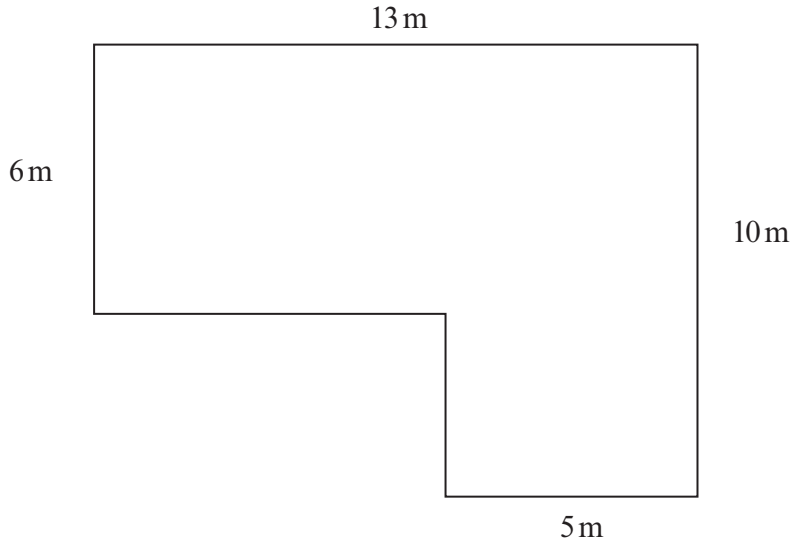


Diagram not drawn to scale

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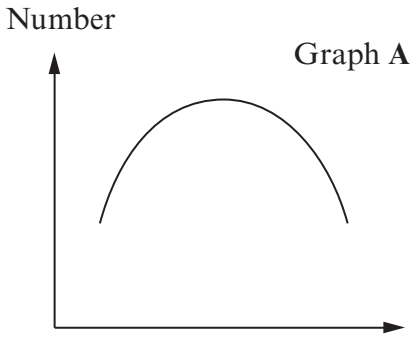
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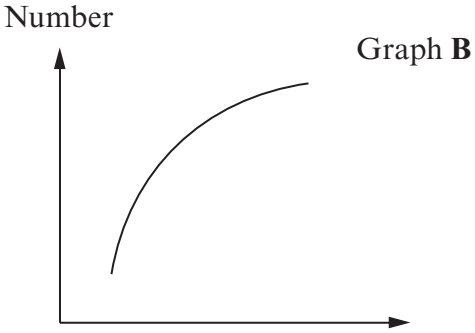
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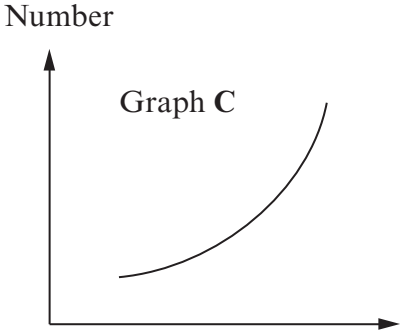
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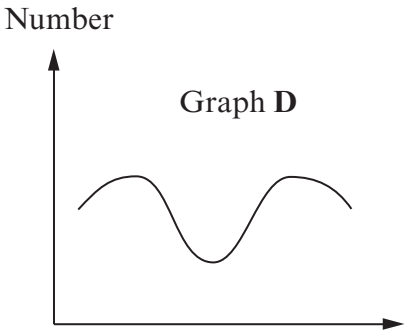
Examiner only

12. The following graphs **A**, **B**, **C** and **D** have been seen in newspapers.
Important information is missing from each of the graphs.









Which graph, **A**, **B**, **C** or **D**, do you think appeared alongside each of the following stories?

'Eating out is more popular with the middle-aged.'

Graph .....

'Increase in house sales is slowing down.'

Graph .....

'Trends show that it's the young and the old who watch TV the most.'

Graph .....

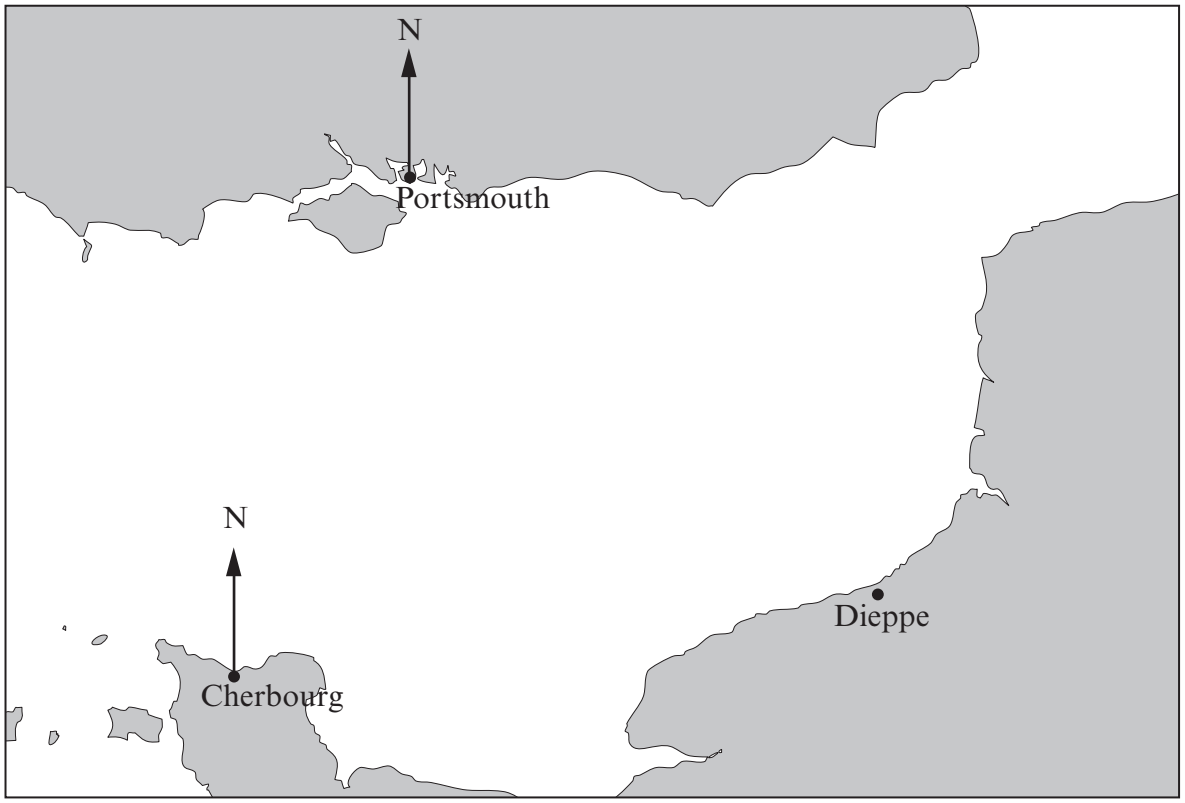
[3]

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13. The map shows a scale diagram of part of the English Channel.

Scale : 1 cm represents 20 km



(a) A ship is on a bearing of 058° from Cherbourg and on a bearing of 135° from Portsmouth. By drawing suitable lines on the diagram above, find and mark the position of the ship. [3]

(b) How far, in km, is the ship from Dieppe at this point?

.....

.....

[2]

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14. Denise wants to test the following hypothesis.

'New cars use less fuel than old cars.'

She plans to

- send a short questionnaire to every house in her street,
- ask the following questions,
  - (i) Do you have a car?
  - (ii) How much fuel does it use?

Write down three unfavourable comments about this plan.

1. .....

.....

.....

2. .....

.....

.....

3. .....

.....

.....

[3]

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15. Asif drove his car 270 miles, measured correct to the nearest 10 miles.

He used 28 litres of fuel, measured correct to the nearest litre.

Complete the table below to show the least and greatest distance that Asif could have travelled and the least and greatest amount of fuel that he could have used.

	Least Value	Greatest Value
Distance	..... miles	..... miles
Fuel	..... litres	..... litres

[4]

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16. Kelly invests £6000 for 3 years at 2% per annum compound interest.
Calculate the value of her investment, correct to the nearest penny, at the end of the 3 years.

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[4]

END OF PAPER

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Question number	**Additional page, if required. Write the question numbers in the left-hand margin.**

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GCSE MARKING SCHEME

MATHEMATICS - UNITISED

JANUARY 2013

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INTRODUCTION

The marking schemes which follow were those used by WJEC for the January 2013 examination in GCSE MATHEMATICS - UNITISED. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

	Page
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Unit 1 – Higher Tier	4
Unit 2 – Foundation Tier	7
Unit 2 – Higher Tier	10
Unit 3 – Foundation Tier	14
Unit 3 – Higher Tier	17

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UNIT 1 - FOUNDATION TIER

UNIT 1 Foundation Tier	P	Mark	Final Mark Scheme Comments
1(a) (i) 72034		B1	
1(a)(ii). Five hundred and forty thousand, two hundred and seven.		B1	
1(b). (Ten percent =) 6657 6657 × (£)3 = (£)19971 (To nearest thousand) (£)20000.	P P P P	B1 M1 A1 A1	 F.T. 'their 6657'. F.T. 'their 19971'.
2(a). 38		B1	
2(b). Indicates '2nd notch to the right of 80'.		B1	Allow unambiguous intent.
3. An attempt to find values that may be directly compared. Finding (25%) 30% and 20% OR 25/100 30/100 and 20/100 or equivalent. OR 0·25 0·3 and (0·2) OR three correct calculations for a common amount. (Best bonus scheme from) Company B		M1 A1 A1	All %, OR all fractions with common denominator, OR all decimals, OR using a common amount for sales made, OR a valid combination. Accept 2·5/10 if comparing 'tenths'. F.T. if only one error made. Accept any unambiguous indication that Company B has been chosen (e.g. '3/10 is best'). SC1 if Company B chosen but with no supporting work.
4. (75 – 99) (100 – 124) **125 – 149** (150 – 174) Using a tally convention. (6) 8 12 4	P P P P	B1 B1 B2	 Need not be accurate. B2 for all three correct. B1 for 1 or 2 correct.
Ribbon marking for 5(a) and 5(b). 5(a). Cost = 24 × (£)35 + (£)70 = (£)910 5(b). Monthly payment = $\frac{(£)530 - (£)50}{24}$ = (£)20		 M1 A1 M1 A1	 Correctly substituted. M0 if 24 × (£)105 attempted. Correct substitution showing subtraction and division. Allow embedded reference to the correct answer.
6. Position / Name of Dog / Weight 1 / Nell / (10·6kg) 2 / Smot / (9kg 624gm) 3 / Buster / (8·72kg) 4 / Rover / (8·572kg) 5 / Peg / (7964gm)		B3	Mark the order of names only. Disregard any weights that are not given in the question. Allow unambiguous use of friends' names or weights instead of dogs' names. B1 for Nell AND Peg in correct positions B1 if 'Smot > Buster'. B1 if 'Buster > Rover'. *SC1 for complete reversal of names.*
7(a). 6		B1	
Ribbon marking for 7(b), 7(c) and 7(d). 7(b). 4 (min) 8 (sec) 7(c). 3 (min) 47 (sec) 7(d). 21 s(econds)		 B1 B1 B2	 SC1 if both correct answers to (b) and (c) are reversed. (Award this SC1 in part (c).) F.T. the time difference between their (b) and their (c). B1 for 21 OR B1 for -21 s(econds) B0 for -21
8. Showing an understanding of range. (Maximum range for Adam =) 59 (Minimum range for Ben =) 41		S1 B1 B1	Must be for runs scored. OR B2 for finding a possible range for Adam that is greater than a possible range for Ben.

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UNIT 1 Foundation Tier		Mark	Final Mark Scheme Comments
9. (Water used in shower =) $\frac{15 \times 60}{10}$	P	M1	
= 90 (litres)	P	A1	
			Alternative methods
(40% of 150 litres =) $150 \times 0{\cdot}4$	P	M1	*OR*
			$\frac{90}{150} \times 100$ M1 *Using 60% B1*
= 60 (litres)	P	A1	
So, 60% of the water = 90 (litres)	P	A1	*= 60(%) (of Liam's amount) A1* *150 × 0·6 M1*
			(which is) 40(%) less A1 *= 90(litres) A1*
			OR
			60(litres) less B1
			$\frac{60}{150} \times 100$ M1
			= 40(%) A1
'Yes, Tina's claim was correct.'	P	A1	F.T. their values.
Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', litres, % being appropriate)	P P	QWC 2	QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar.
QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer			QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar.
QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer			QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar
10. Repeated attempt to find 1/10 followed by a subtraction of two different amounts. OR Attempt to find 9/10 of two different amounts.		M1	M1 awarded for intent.
(End of 2nd year) 360 (complaints)		B1	
(End of 3rd year) 324 (complaints)		A1	Penalise extra work –1 (e.g. 4th year) , only if M1B1A1 already awarded. Treat 'increase' as a misread.
11. A correct strategy to find area.	P	S1	Dividing floor area into rectangles.
$6\times13 + 5\times4$ OR $6\times8 + 10\times5$ OR $10\times13 - 8\times4$	P	M1	
$= 98(m^2)$	P	A1	
(Weekly rent =) $98 \times$ (£)5	P	M1	F.T. 'their 98 '.
= (£)490	P	A1	
12. A		B1	
B		B1	
D		B1	

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UNIT 1 Foundation Tier		Mark	Final Mark Scheme Comments
Ribbon marking for 13(a) and 13(b). 13(a). Bearing of 058° from Cherbourg. Bearing of 135° from Portsmouth. Position marked OR two lines intersecting. 13(b). $3{\cdot}9 \times 20$ 78 (km)		 M1 M1 A1 M1 A1	**Use overlay.** ± 2° (use overlay). Allow the M marks for dots, crosses or any unambiguous indication that the correct bearings have been offered. F.T. if at least M1 and two intersecting lines. **Use measuring tool.** F.T. their ship's position. Accept ± 0·2cm. Answers in the range 74 to 82 (km) gain M1A1.
14. Three different valid comments. e.g. 'Not representative.' 'Should only be distributed to car owners', 'Does not ask about the age of the car', 'Does not specify over what period of time', 'How are the questionnaires returned?' 'People might confuse quantity with cost', 'Engine size' 'Type of fuel (diesel/petrol)'	 P P P	B3	B1 for each different valid comment. Accept equivalent statements e.g. 'biased' (by location). Do not give more than one mark for the same criticism(s).
15. Least Value Greatest Value 265 275 27·5 28·5		 B4	 B1 for each correct entry. Accept 274·9 recurring but not 274·9. Accept 28·49 recurring but not 28·49.
16. 6000 120 6120 122.4(0) 6242.4(0) 124.84(8) 6367.24(8) (£) 6367.25 OR 636725(p)	P P P P	B1 M1 A1 A1	For the evaluation of a correct 2% OR Sight of 1·02 (360 and 6360 imply use of 3× 120 and gain B1) For attempting to find 3 different 2%. OR $6000 \times 1{\cdot}02^3$. F.T. one error. Accept £6367.25p. Do not accept 6367.25p. Mark final value of investment (i.e. do not penalise if they continue to give £367.25)

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UNIT 1 - HIGHER TIER

UNIT 1 Higher Tier	P	Mark	Final Mark Scheme Comments
1. (F =) $100 \times 100 - 100^2$ $= 0$		M1 A1	
2(a). Attempt at $\sum f \times x$ (162) Division by $\sum f$ (20) (Mean =) 8·1 (goals)		M1 m1 A1	 C.A.O. Accept 8 (goals) only if 162/20 seen.
Ribbon marking for 2(b)(i) and 2(b)(ii). 2(b)(i). 1-5 | 6-10 | 11-15 | 16-20 | 21-25 | 26-30 3 | 10 | 6 | 0 | 1 | 0 1-10 | 11-20 | 21-30 13 | 6 | 1 2(b)(ii) E.g. '*Kick* because it is more detailed'. '*Penalty!* because its less cluttered'.		 B2 E1	 'Blank spaces' to be taken as 0. For all 9 correct entries. B1 for 7 or 8 correct entries. Allow F.T. from '*Kick'* table to *'Penalty!'* table. Reason must be valid for their choice.
3. Three different valid comments. e.g. 'Not representative.' 'Should only be distributed to car owners', 'Does not ask about the age of the car', 'Does not specify over what period of time', 'How are the questionnaires returned?' 'People might confuse quantity with cost', 'Engine size' 'Type of fuel (diesel/petrol)'	 P P P	B3	B1 for each different valid comment. Accept equivalent statements e.g. 'biased' (by location). Do not give more than one mark for the same criticism(s).
Ribbon marking for 4(a) and 4(b). 4(a). Bearing of 058° from Cherbourg. Bearing of 135° from Portsmouth. Position marked OR two lines intersecting. 4(b). (Distance =) $3{\cdot}9 \times 20$ (= 78) (Speed =) $\frac{3{\cdot}9 \times 20}{4}$ = 19·5 (km/h)		 M1 M1 A1 M1 M1 A1	**Use overlay.** ± 2° (use overlay). Allow the M marks for dots, crosses or any unambiguous indication that the correct bearings have been offered. F.T. if at least M1 and two intersecting lines. **Use measuring tool.** F.T. their ship's position. Accept ± 0·2cm. Dependent on both M marks.
5. (Jack receives) $450 \div 1{\cdot}2$ = (£)375 (Gillian receives) $400 \times 1{\cdot}08$ = 432(euros) A clearly stated explanation that <u>each</u> would have received more of their required currency by swapping.	P P P P P	M1 A1 M1 A1 E1	*<u>Alternative method</u>* *$450 \div 400$* *M1* *$= 1{\cdot}125$* *A1* *$1{\cdot}08 < 1{\cdot}125 < 1{\cdot}2$* *E1* *$1{\cdot}125 < 1{\cdot}2$better for Jack* *E1* *$1{\cdot}125 > 1{\cdot}08$better for Gillian* *E1* Explanation should refer to amounts. Allow one arithmetical slip when awarding E mark.

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UNIT 1 Higher Tier	P	Mark	Final Mark Scheme Comments
6. (Total income =) (£)44600 (Taxable income =) (£)37125 A correct method of finding 20% or 40% of a relevant value. (Tax due =) (£) 850 (+ 7000) = (£)7850. (Tax paid =) (£)8920 AND a correct statement for their amount Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', £ , % being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	P P P P P P P P P	B1 B1 M1 A1 A1 A2 QWC 2	F.T. 'their total income' – 7475. F.T. 40% of ['their 37125' – 35000]. F.T. 'their 850' + 'their 7000'. F.T. 20% of 'their 44600'. OR showing £7850 to be 17·6% of £44600. A1 if no statement or an incorrect statement. QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar.
7. *(The following are for using the two times linked to Carol as a starting point).* Looking at time differences. (Differences) 2days, 7hours, 10min (Bryn phoned on 'Wed 6.24am + 2days 7hrs 10min') Friday at 1 : 34 p.m. OR *(The following are for using the two times linked to the answering machine as a starting point).* Looking at time differences. (Differences) 1days, 4hours, 6min (Bryn phoned on 'Sat 5.40pm – 1day 4hrs 6min') Friday at 1 : 34 p.m.	 P P P P P OR P P P P P	 M1 A2 A2 OR M1 A2 A2	 Award M1 if any one of the following is being considered, Sat/Thurs OR 5pm/10am OR 40/30. A1 for one correct difference. Units not required as long as each value is unambiguously identifiable. F.T. their differences. A1 for one correct. Must have p.m. (or a.m. on a FT) or correct 24-hour time for the A2. OR Award M1 if any one of the following is being considered, Wed/Thurs OR 6am/10am OR 24/30. A1 for one correct difference. Units not required as long as each value is unambiguously identifiable. F.T. their differences. A1 for one correct. Must have p.m. (or a.m. on a FT) or correct 24-hour time for the A2.
8. 87% ≡ (£)4760000 (Last year's profit) $\frac{4760000}{87} \times 100$ = (£)5471264(.368) = (£)5470000	P P P P	B1 M1 A1 B1	Accept any indication. F.T. from above if of equivalent difficulty.

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UNIT 1 Higher Tier	P	Mark	Final Mark Scheme Comments
9. Sight of (diameter =) 49·5 (cm) Sight of (length =) 45·5 (cm) AND (width =) 32·5(cm) (Circumference =) $\pi \times 49{\cdot}5$ OR (Perimeter =) $2 \times (45{\cdot}5 + 32{\cdot}5)$ (Crcmf. =) 155·5(cm) AND (Perim. =) 156(cm) A clear statement that the length of tape around the rectangular base can be longer than the length around the circular base.	P P P P P	B1 B1 M1 A1 A1	Or (radius =) 24·75 (cm) *Ignore other values.* F.T. their values as long as 'diameter ' < 50, 'length' > 45 and 'width' > 32. Accept 155·4 to 155·6 for circumference. Accept equivalent wording as long as it is consistent with 'Perimeter' > 'Circumference'.
10. $12 \times \frac{72000}{54000}$ $\times \frac{1}{2}$ = 8 (hrs)		M1 M1 A1	Or equivalent work. Or equivalent work. C.A.O.
Ribbon marking for 11(a) and 11(b). 11(a) . $\frac{80}{360} \times 2 \times \pi \times 15$ = 20·9(4....) (cm) OR $20\pi/3$ 11(b). $\frac{360 - 80}{360} \times \pi \times 15^2$ = 549(·77...) (cm^2) OR 175π		M1 A1 M2 A1 5	 Accept 20·9 to 21 inclusive. M1 for $\frac{80}{360} \times \pi \times 15^2$ and A1 for 157(·07..) Accept 549 to 550 inclusive.
12 Use made of 'Distance / Time'. Use made of '1000 metres in 1 km'. Use made of '1 mile ≈ 1·6km'. Use made of '3600 seconds in 1 hour'. $\left[\frac{60 \times 3600}{1000 \times 1{\cdot}6 \times 3}\right]$ = 45 (mph)	 P P P P P	 M1 M1 M1 M1 A1	Candidates may earn these M marks (or some of them) in the order that they undertake each step. *(Watch out for embedded 'multiple method' steps.)* *(Ignore units at this stage.)* E.g. (i) $60/3 = 20(ms^{-1})$ $20 \times 3600 = 72000(mh^{-1})$ $72000/1000 = 72(kmh^{-1})$ 72/1·6 E.g. (ii) 1mile = 1600m (2^{nd} M1 and 3^{rd} M1) 1600/20 = 80 (1^{st} M1 implied by 20) 3600/80 (4^{th} M1) (To gain <u>all four</u> M marks then candidates must make <u>correct use</u> of each one.) *Note when part methods are earned* *E.g. 20/1600 (= 0.0125)* *M1, M1, M1, M0* A0 if any pre-approximations used.
13. (Volume of cone =) $\frac{1}{3} \times \pi \times 12^2 \times h$ (Volume of cylinder =) $\pi \times 12^2 \times 5h$ 20 litres = 20000 (cm^3) $20000 = \frac{1}{3} \times \pi \times 12^2 \times h + \pi \times 12^2 \times 5h$ $h = \frac{3 \times 20000}{144 \times \pi \times 16}$ or equivalent = 8·28(93..) (Total height =) 49·7(.....) (cm)	P P P P P P	B1 B1 B1 M1 A1 A1 A1	Accept any notation or word(s) for 'height'. B1 given only when its height is noted as 5× height of cone. F.T their '20000'. F.T. their two volumes only if of equivalent form (i.e. contains 'π' AND the <u>height of the cylinder expressed as a multiple of the height of the cone</u>.) Accept correct to 1dp. F.T. 6 × 'their 8·28(93..)'.

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Surname	Centre Number	Candidate Number
Other Names		0

WJEC CBAC

GCSE

4351/01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: Mathematics In Everyday Life

FOUNDATION TIER

A.M. TUESDAY, 6 November 2012

$1\frac{1}{4}$ hours

ADDITIONAL MATERIALS

A calculator will be required for this paper.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **5**.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	**4**	
2	**4**	
3	**4**	
4	**5**	
5	**7**	
6	**4**	
7	**3**	
8	**4**	
9	**5**	
10	**6**	
11	**6**	
12	**5**	
13	**3**	
14	**5**	
TOTAL MARK		

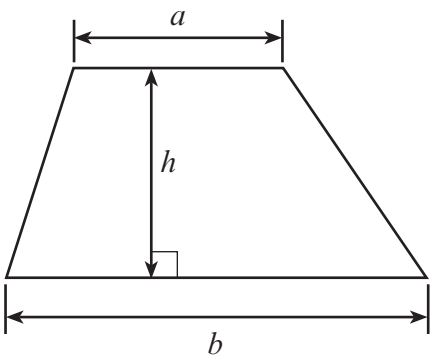
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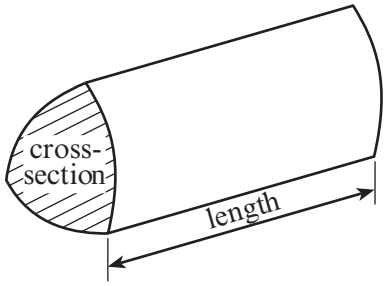
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Formula List

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



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Examiner only

1. Drinks are sold from a van parked outside an office block.

The following signs are shown alongside the van.

OPEN

Monday	8:00 a.m. – 2:00 p.m.
Tuesday	8:00 a.m. – 2:00 p.m.
Wednesday	8:00 a.m. – 6:00 p.m.
Thursday	8:00 a.m. – 2:00 p.m.
Friday	8:00 a.m. – 2:00 p.m.
Saturday	9:00 a.m. – 1:30 p.m.
Sunday	Closed

PRICES

	Small	Medium	Large
TEA	80p	£1.00	£1.15
COFFEE	£1.00	£1.20	£1.45
JUICE	£1.10	£1.30	£1.55

(a) On which day is the van open later than usual?

.....

[1]

(b) For how long is the van open to sell drinks on a Monday?

..... hours.

[1]

(c) How much would you have to pay altogether for a small tea and a large coffee?

.....

.....

.....

[2]

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2. An advertising display in a shopping centre is made up of a number of cubes as shown below.

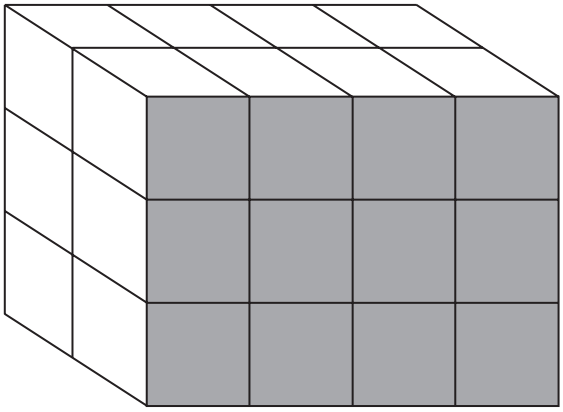


Diagram not drawn to scale

The length of one edge of each cube is 1 metre.
One face of the display is shaded.

(a) What is the total volume of the display?

..... m^3

[1]

(b) What is the area of the shaded face of the display?

..... m^2

[1]

(c) A silver thread is attached around the perimeter of the shaded face of the display.
What is the length of this thread?
You must give the units of your answer.

.....

.....

[2]

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3. The cost of renting a holiday cottage is given by the formula

Cost = Number of days × £60 + Fixed charge.

Four friends decide to rent the cottage for **5 days** when the **fixed charge is £120**.

How much will **each** friend pay if the cost is shared equally?

.....

.....

.....

.....

.....

.....

.....

[4]

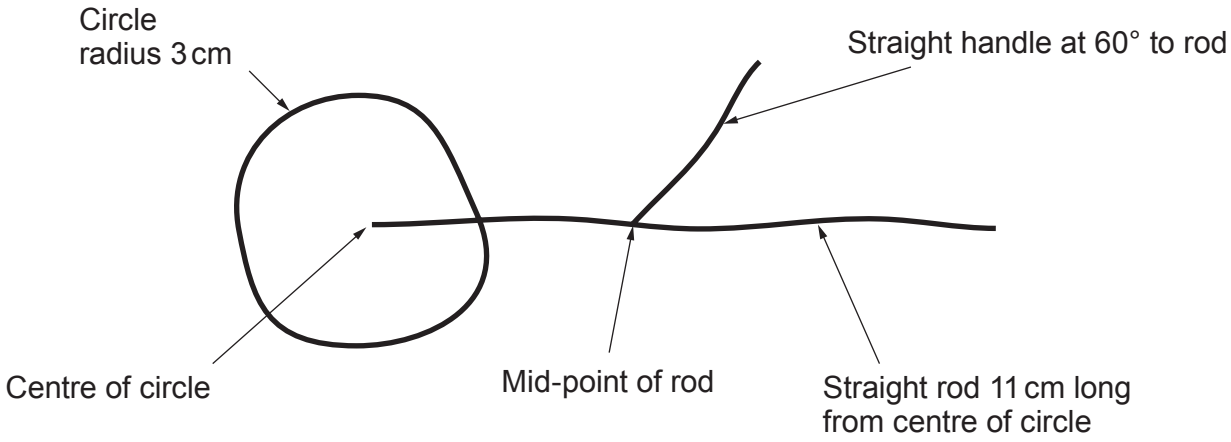
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4. A toy maker has an idea for a new toy.
He has made a sketch and written some notes that he will use to make further plans.



Make an **accurate** drawing of the sketch in the space below.
It does not matter what length you make the handle as long as it is at an angle of 60° to the rod.

You do **not** have to copy the toy maker's written notes.

[5]

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5. *You will be assessed on the quality of your written communication in this question.*

A bakery sells cakes.

One week they sold £2500 worth of cakes.
The total cost of making these cakes was £700.

The following week, the bakery increased the number of cakes that they made.

As a result of this
- they sold three times as many cakes,
- the total cost of making the cakes doubled.

Showing all your calculations, check to see if their weekly profit has doubled, trebled or more than trebled.

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.....

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[7]

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Turn over.

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6. A factory making computer printers expects to produce 800 printers each day.

The daily production is recorded as follows.

- A daily production of 815 printers is recorded as +15
- A daily production of 796 printers is recorded as –4

The production record for a five day period is shown below.
Two of the entries are blank.

Monday	Tuesday	Wednesday	Thursday	Friday
–13	+12			–8

On Wednesday, 793 printers were produced.

On Thursday, 2 fewer printers were produced than on Friday.

(a) Fill in the entries in the table for Wednesday and Thursday.

[2]

(b) How many printers were produced on Monday?

.....

.....

[1]

(c) How many more printers were produced on the highest production day than on the lowest production day?

.....

.....

[1]

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7. A company offers its workers a choice on how much their salary will increase next year. Each worker can receive either a £500 increase or a 2% increase on their present salary.

Janet is currently on a salary of £24 000 per year.

Which option should Janet choose? You **must show the calculations** that support your answer.

.....

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[3]

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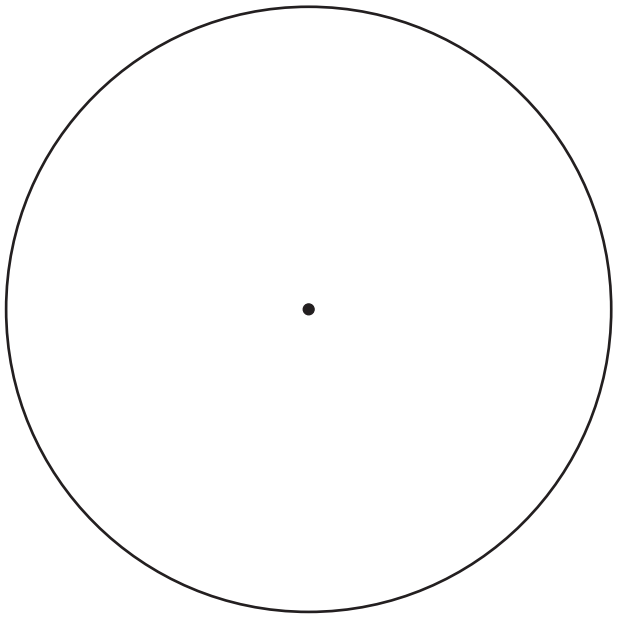
Examiner only

8. A hospital collected data on the age group of each of 120 people that were treated as outpatients on a particular day.

The results are summarised below.

Age group	Number of people
Pre-school	18
School	24
60 and over	35
Others	43

Draw a pie chart to illustrate these results.
You should show how you calculated the angles of your pie chart.



.....

.....

.....

.....

.....

[4]

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9. Kevin drove from Newcastle to Swindon, a distance of 273 miles.
He started his journey at 9:15 a.m. and arrived in Swindon at 4:15 p.m.

(a) Calculate his average speed for the journey.

.....

.....

.....

.....

.....

[3]

On average, his car uses one gallon of diesel per 40 miles travelled.
A gallon of diesel costs approximately £6.30.

(b) Find an estimate, to the nearest £, of how much it cost him for the diesel used on the journey.

.....

.....

.....

.....

.....

[2]

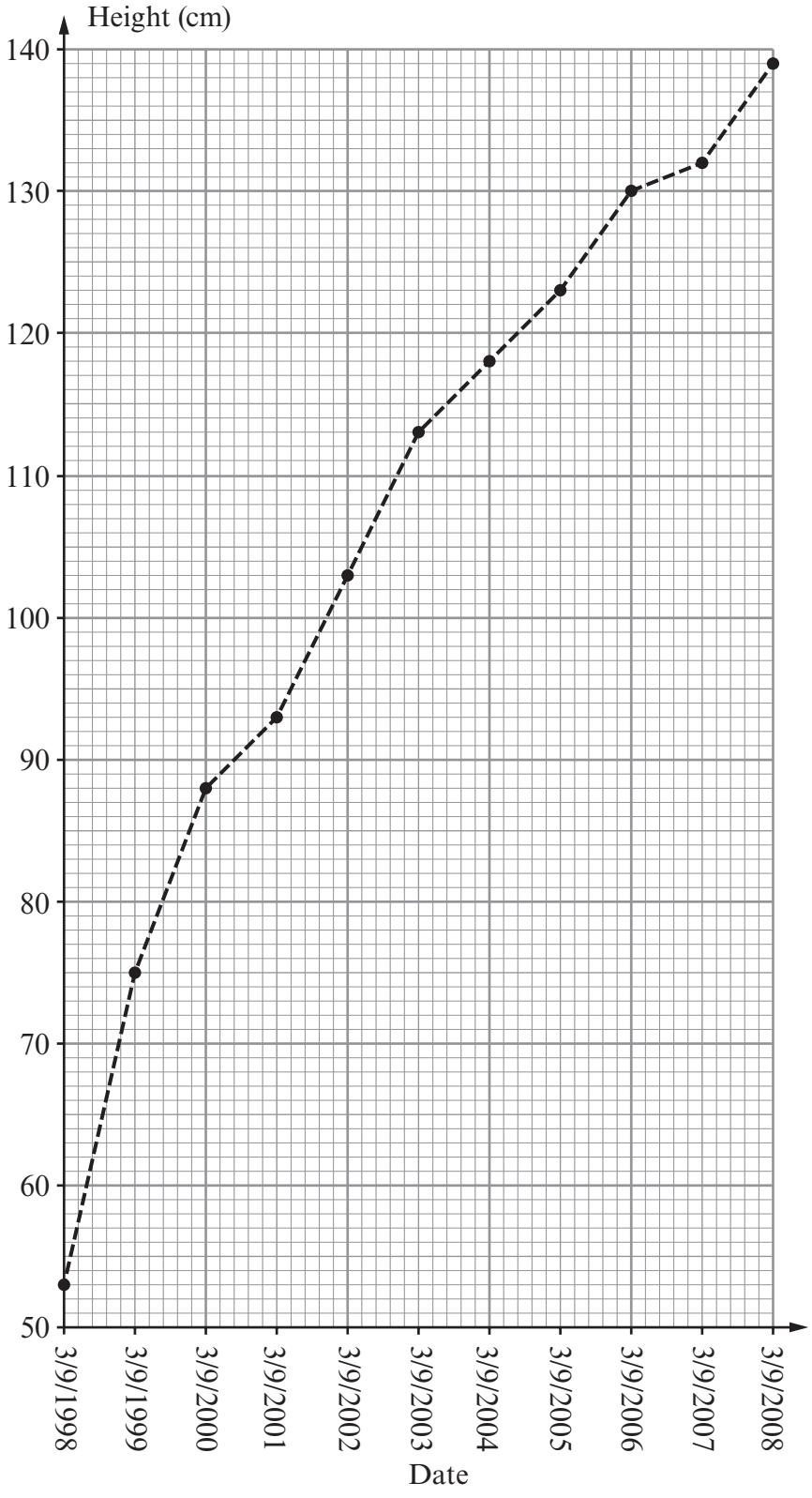
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10. *(a)* Kate's parents measured her height on each of her birthdays until she was ten years old. Starting with Kate's recorded height on the day she was born, her parents drew a graph to show this information.

The graph they drew is shown below.



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Use the graph to answer the following.

(i) What was Kate's recorded height when she was born?

..... cm

[1]

(ii) Between which two birthday dates did Kate grow the least?

Between 3/9/..... and 3/9/.....

[1]

(iii) How tall was Kate on the day she was 4 years old?

..... cm

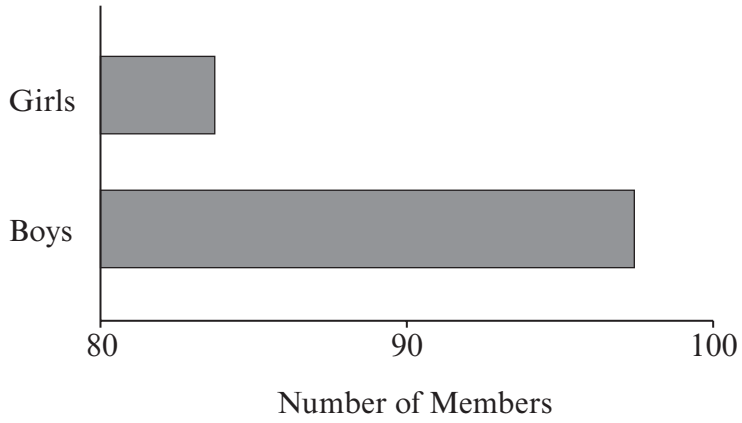
[1]

(iv) What will Kate's age be, in years, on 1st January 2015?

..... years old

[1]

(b) The following diagram is intended to show the number of girls and the number of boys who are members of a youth club.



In what way could the information shown in the diagram be misunderstood?

.....

.....

.....

What is the reason for this?

.....

.....

[2]

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11. Olga wants to paint one side of a garden wall.
The wall is 2 metres high and 35 metres long.

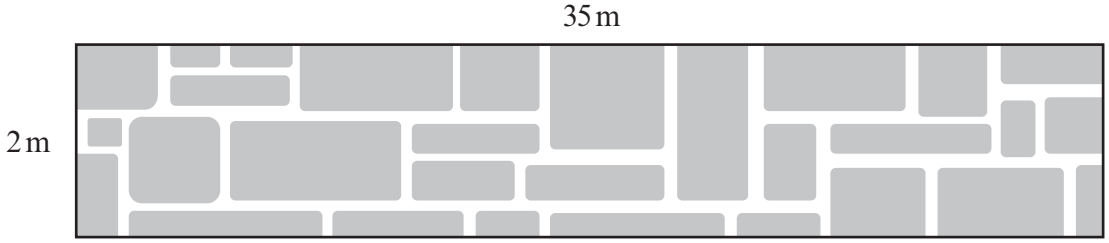


Diagram not drawn to scale

She has found the following information about the special paint that she needs.

- It is only sold in 5 litre and 2 litre tins
- One litre is enough to cover an area of 6 m^2
- The tins are sold at a price of
  - £12 for a 5 litre tin
  - £6 for a 2 litre tin

Showing all your calculations, find the least amount she has to pay for enough paint to cover the wall.

.....

.....

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.....

.....

[6]

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12. The map shows a scale diagram of part of the Spanish Mediterranean coastline.

Scale: 1 cm represents 30 km



(a) What is the straight line distance in kilometres between Barcelona and Valencia?

.....

.....

[2]

(b) A ship is on a bearing of 070° from Valencia and on a bearing of 200° from Barcelona. By drawing suitable lines on the diagram above, find and mark the position of the ship.

[3]

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13. A survey was carried out to find how often teenagers use libraries.

The following two questions were asked in a questionnaire.

Q1. *What is your address?*

Q2. *How often do you visit a library?*

Never	*1-5 times*	*5-10 times*	*More than 10 times*
☐	☐	☐	☐

(a) For each question give **one** reason why it is not suitable.

Q1 .....

.....

Q2 .....

.....

[2]

(b) The survey was carried out by leaving a folder containing copies of the questionnaire on the front desk of libraries.
Give **one** criticism of how the survey was carried out.

.....

.....

[1]

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14. A book store displays the following offer.



Karl wants to buy seven books costing £5.99, £7.50, £7.50, £7.99, £7.99, £10 and £10.
Karl wants to pay as little as possible for the books.

Show whether this offer is as good for Karl as another offer, which would give him 25% off the total cost of the seven books.

[5]

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GCSE MARKING SCHEME

MATHEMATICS - UNITISED

NOVEMBER 2012

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INTRODUCTION

The marking schemes which follow were those used by WJEC for the November 2012 examination in GCSE MATHEMATICS - UNITISED. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

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UNIT 1 - FOUNDATION TIER

UNIT 1 Foundation Tier	Mark	FINAL MARK SCHEME Comments
1. (a) Wednesday (b) 6 (hours) (c) (£)0.8(0) + (£)1.45 OR 80(p) + 145(p) = (£)2.25 or 225(p)	B1 B1 M1 A1 4	
2. (a) 24 (m^3) (b) 12 (m^2) (c) 14 m or metres	B1 B1 B1 U1 4	
3. (Cost =) 5 × (£)60 + (£)120 = (£) 420 (Each pays) (£)420 ÷ 4 (£)105	M1 A1 M1 A1 4	For intent to multiply£60 by 5 and then add £120. F.T. 'their total cost' ÷ 4.
4. Correct circle. Straight line 11cm long. Mid-point of line identified. Angle of 60° drawn (as per sketch)	 B2 B1 B1 B1 5	*Allow lengths to be ±2mm and angle ±2°.* B1 if a circle drawn but radius ≠ 3cm. 'Free-hand circle' is B0 unless within overlay tolerance. Allow this B1 even if line does not start at centre of circle BUT see below. F.T. their line length. Does not need to be at mid-point for this B1, BUT Penalise −1 once only if one end of the rod is not at centre of circle OR handle is not at mid-point.
5. (Profit week 1 =) (£)1800 (Profit week 2 =) 3 × (£)2500 − 2 × (£)700 = (£)6100 6100 ÷ 1800 OR 1800 × 3 OR 6100 ÷ 3 (3·3(....)) (5400) (2033(.33..)) A statement 'Profit has more than trebled'. Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', '£', × being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	B1 M1 A1 M1 A1 QWC2 7	For any correct method that enables a conclusion. F.T. their 'profits'. Statement alone gains M1A1 only if there are stated profits to compare. QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar.

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UNIT 1 Foundation Tier	Mark	FINAL MARK SCHEME Comments
6. (a) −7 −10 (b) 787 (c) 25	B2 B1 B1 4	B1 for each. F.T. their table. B0 for −25.
7. 24000 × 0·02 = (£)480 Janet should choose the £500 option.	M1 A1 A1 3	For any correct method of finding 2% of 24000. *<u>Alternative method</u>* *500 / 24000 × 100 M1* *= 2·08(....%) A1* A statement must be made. F.T. their '£480'. Ignore any further statements.
8. 3 or 4 angles correct and correctly labelled. 3 or 4 angles correct, labels not fully correct. 2 angles correct and correctly labelled. 2 angles correct, labels not fully correct. 1 angle correct and correctly labelled. OR <u>If 0 OR 1 for their diagram or no diagram,</u> 360/120 Angles are 54°, 72°, 105° and 129°	 B4 OR (B3) (B3) (B2) (B1) (M1) (A1) 4	Use overlay Allow ±2° Correct labels (Words NOT the frequency OR angle). 3 correct labels is enough. If only B1 is scored for the diagram, and all the angles given correctly, then cancel the B1 and award M1, A1 for 2 marks. If B0 scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded. (1 is) 3° gets the M1. OR SC1 for all correct percentages: 15, 20, 29·2 or 29, 35·8 or 36.
9 . (a) (Time taken =) 7(hours) OR 420(min) Use of 'Distance' ÷ 'Time' = 39 (mph) OR 62·4(kph) OR equivalent. (b) $\frac{273}{40}$ × (£)6.3(0) (£)43	B1 M1 A1 M1 A1 5	 F.T. 'their time'. Any other unit of speed must be stated. *Also allow 280/40 × 6·3 OR 273/40 taken as 7gallons for M1 leading to (£)44 for A1.* (£)42.99(..) is A0. SC1 for evidence of 273/40 (=6·825) taken as 6 ×£6.30 = £38 to nearest '£'
10. (a) (i) 53 (cm) (ii) (3/9/) 2006 and (3/9/) 2007 (iii) 103 (cm) (iv) 16 (b) Comment on misleading visual appearance. e.g. 'looks as if many more boys'. Comment on 'Number' scale not starting at zero. e.g. 'only starts at 80'.	B1 B1 B1 B1 B1 B1 6	 Ignore fractions of a year e.g. 16yrs 4m or 16·3yrs Do not accept 'there are more boys'. Accept the (distinct) comments in either order.

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UNIT 1 Foundation Tier	Mark	FINAL MARK SCHEME Comments	
11. (Area =) 2×35 $= 70(m^2)$	M1 A1		
(Litres required =) $70 \div 6$ $= 11{\cdot}6(.....)$ or 12.	M1 A1	An area must be indicated for a F.T. F.T. 'their area'. A0 for 11 remainder 4 unless 12 used later.	OR <u>if area of wall found</u> Using 5×6 AND 2×6 M1 $= 30(m^2)$ AND $12(m^2)$ A1
(Need to buy) Two '5l tins' and One '2l tin'.	M1	F.T. 'their required litres'. Must be for cheapest combination possible.	F.T. their area.
(Cost =) (£)30	A1 6		
12. (a) 10×30 300 (km)	M1 A1	Accept $(10 \pm 0{\cdot}2) \times 30$. Answers in the range 294 to 306 (km) gain M1A1	
(b) Bearing of 070° from Valencia.	M1	± 2° (use overlay). Allow the M marks for dots, crosses or any unambiguous indication that the correct bearings have been offered.	
Bearing of 200° from Barcelona.	M1		
Position marked OR two lines intersecting.	A1 5	F.T. if at least M1 and two intersecting lines.	
13. (a) Q1. A statement regarding e.g. 'not relevant', 'confidentiality', 'too personal'	B1	For any equivalent statement. Ignore extra comments.	
Q2. 'times not exclusive' 'over what period of time?'	B1	For any **one** of these, or equivalent statement. Ignore extra comments. *SC1 if <u>both</u> correct but in reverse order.*	
(b) A criticism regarding location (biased at library) OR poor distribution method. OR does not target teenagers.	B1 3	For any **one** of these, or equivalent statement. Ignore extra comments.	
14. Showing strategy of two sets of 3 books + 1 book. 'Best' combination found. (£7.99 and £7.50 free)	S1 B1	Adding five of the prices implies this S1. Implied by sight of (£)41.48	
$\frac{25}{100} \times$ (£)56.97 $=$ (£)14.24(..)	M1 A1	Allow $0{\cdot}25 \times$ 'attempted sum of the **<u>seven</u>** prices' C.A.O.	
'Buy 3 get cheapest free' a better offer than 25% off.	B1 5	F.T. their derived amounts (must have considered at least one free book to derive one amount and must have used 25% to derive other amount). *<u>Alternative methods for M1, A1.</u>* *$\frac{(7.99 + 7.50)}{56.97} \times 100$ F.T..their 'saving'. M1* *$= 27(\cdot 18.)(\%)$ A1* *OR Comparing prices M1* *(£)41.48 (F.T..their 'saving') AND (£)42.73 or (£)42 72(....) A1*	

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UNIT 1 - HIGHER TIER

UNIT 1 Higher Tier	Mark	FINAL MARK SCHEME Comments	
1. Bearing of 070° from Valencia. Bearing of 200° from Barcelona. Position marked OR two lines intersecting.	M1 M1 A1 3	± 2° (use overlay). Allow the M marks for dots, crosses or any unambiguous indication that the correct bearings have been offered. F.T. if at least M1 and two intersecting lines.	
2. (a)(i) French AND reference to greater spread. (ii)Geography AND reference to 'more high marks'. (b) Comment on misleading visual appearance. e.g. 'looks as if many more boys'. Comment on 'Number' scale not starting at zero. e.g. 'only starts at 80'.	B1 B1 B1 B1 4	Mark allowed for understanding of spread. Ignore extra comments. Do not accept any explanation if based on a calculation. Do not accept e.g. 'Geography because most scored 7 (whilst in French most scored 4)' unless further understanding is shown. Ignore extra comments. Do not accept 'there are more boys'. Accept the (distinct) comments in either order.	
3. (Area =) 2×35 $= 70(m^2)$ (Litres required =) $70 \div 6$ $= 11{\cdot}6(.....)$ or 12. (Need to buy) Two '5l tins' and One '2l tin'. (Cost =) (£)30	M1 A1 M1 A1 M1 A1 6	An area must be indicated for a F.T. F.T. 'their area'. A0 for 11 remainder 4 unless 12 used later. F.T. 'their required litres'. Must be for cheapest combination possible.	OR <u>if area of wall found</u> Using 5×6 AND 2×6 M1 $= 30(m^2)$ AND $12(m^2)$ A1 F.T. their area.
4. (a) (i) $2 \times (100)^3$ $= 2000000$ (ii) 2000 (b) ½ x 4.5 x 6 $= 13.5\ (cm^2)$	M1 A1 B1 M1 A1 5	OR F.T. 'their (i)' / 1000.	

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UNIT 1 Higher Tier	Mark	FINAL MARK SCHEME Comments
5. Showing strategy of two sets of 3 books + 1 book. 'Best' combination found. (£7.99 and £7.50 free) $\frac{25}{100}$ × (£)56.97 = (£)14.24(..) 'Buy 3 get cheapest free' a better offer than 25% off. Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', £ and % being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	S1 B1 M1 A1 B1 QWC2 <

UNIT 1 Higher Tier	Mark	FINAL MARK SCHEME Comments
7. (a) $1050 = \frac{1{\cdot}8 \times 900 - F}{1{\cdot}2}$	B1	For correct substitution.
$(F =) \ 1{\cdot}8 \times 900 - 1050 \times 1{\cdot}2$	M1	Accept $1050 \times 1{\cdot}2 - 1{\cdot}8 \times 900 \ (= -F)$
$(F =)$ 360 (euros)	A1	A0 for –360
(b) Indicates that point A is linked to the fixed cost or that no plates were sold.	B1	Accept any unambiguous equivalent statements. B0 for e.g. 'making a loss' unless there is some reference to the fixed cost or that no plates were sold.
Indicates that point B shows number of plates that must be sold in order to break even.	B1 5	Accept e.g. 'minimum sold in order to start making a profit'.
8. (a) Least capacity = 595 Greatest capacity = 605	B1 B1	Accept 604·999...recurring.
(b) Greatest volume = 120 × 605	M1	F.T. 'their greatest capacity' only if > 600. Ignore other multiplications seen
= 72600(ml) OR 72·6(litres)	A1	
Indicates that 'smallest tank' holds 72500(ml) OR 72·5(litres)	B1	
A statement that there is a possibility of overflowing.	E1 6	F.T. logical statement. Numerical errors are allowed but must remain consistent with the possibility of overflowing. *Note also the correct division arguments* *'72·5 /0·605 = 119·3(...) which is less than 120' OR* *'72·5 /120 = 0·604(1..) which is less than 0·605'.*
9. *Area* *Time* *Machines* *600* *5* *3*		
....	M1	For correctly arriving at a row with (area)1120 OR (time) 4.
....	M1	F.T. above row to 'correctly' arrive at a row with (area)1120 AND (time) 4.
1120 *4* **7** (Watch out for compensating errors)	A1 3	C.A.O. with the answer evaluated. If no marks gained allow SC1 for sight of '40m^2 per machine per hour' or equivalent OR sight of 7/3 or equivalent. *Alternative method* $3 \times \frac{1120}{600}$ *M1* $\times \frac{5}{4}$ *M1* *= 7 (machines)* *A1*
10. 65% ≡ 1144 (Original number) $\frac{1144}{65} \times 100$ = 1760	B1 M1 A1 3	Accept any indication. C.A.O.

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UNIT 1 Higher Tier	Mark	FINAL MARK SCHEME Comments
11. (a) $\frac{310}{360} \times 2 \times \pi \times 3$	M1	
$= 16{\cdot}2(...)$	A1	
(Perimeter =) $22{\cdot}2(..)$(m)	A1	F.T. 'their 16·2' + 6. SC1 for 2·6(....) (*using 50° instead of 310°.)* SC2 for 8·6(....) *In part (b) treat finding the volume of the 'metal left' as a misread and mark accordingly.*
(b) (Area of cross section) $\frac{50}{360} \times \pi \times 2^2$	M1	
$= 1{\cdot}74(5....)(cm^2)$ or $5\pi/9$ or equivalent	A1	
(Volume) $1{\cdot}74(5..) \times 6$	M1	F.T. their derived <u>area.</u>
$= 10{\cdot}4(7...)(cm^3)$ or $10{\cdot}5(cm^3)$ or $10\pi/3$ or equivalent.	A1	*<u>Alternative method</u>* (Volume of cylinder) $\pi \times 2^2 \times 6$ M1 $= 75{\cdot}4...(cm^3)$ or 24π A1 F.T their derived <u>volume</u>. (Volume removed) $\frac{50}{360} \times 75{\cdot}4$ M1 $= 10{\cdot}4(7...)(cm^3)$ or $10{\cdot}5(cm^3)$ or $10\pi/3$ or equivalent. A1
	7	
12. Use of 'Distance' / 'Speed'	M1	Ignore units used
<u>First car</u> (120 / 50) = 2·4 (hrs) or 2(hrs) 24(min) or equivalent.	A1	
<u>Second car</u> $\frac{60}{40} + \frac{60}{60}$	m1	Must show intent to add.
= 2·5 (hrs) or 2(hrs) 30(min) or equivalent.	A1	
Time difference = 6 (min)	A1	F.T. 'their two times'.
	5	
13. (a) Sight of $\frac{1}{3} \times \pi \times 10^2 \times 9$ OR $\frac{1}{3} \times \pi \times 4^2 \times 3{\cdot}6$	M1	For correct substitution(either cone)
300π or $942{\cdot}(47..)(cm^3)$	A1	Accept 942 to 943 inclusive.
$19{\cdot}2\pi$ or $60{\cdot}3(1..)(cm^3)$	A1	Accept 60·2 to 60·4 inclusive.
(Volume of frustum =) $280{\cdot}2\pi$ or $882{\cdot}1(...)(cm^3)$	A1	F.T. 'their two derived volumes'.
(b) $\frac{4}{3} \times \pi \times (\text{radius})^3 = 882{\cdot}1$	M1	F.T. 'their frustum volume'
$(\text{radius})^3 = \frac{882{\cdot}1 \times 3}{4 \times \pi}$ (210·6)	A1	
Radius = 5·9(5..)(cm)	A1	F.T. 'their $(\text{radius})^3$'. Accept an answer of 6 if previous M1, A1 awarded.
	7	

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4351/01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: MATHEMATICS IN EVERYDAY LIFE

FOUNDATION TIER

P.M. MONDAY, 11 June 2012

$1\frac{1}{4}$ hours

ADDITIONAL MATERIALS

A calculator will be required for this paper.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **6**.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	**6**	
2	**3**	
3	**3**	
4	**3**	
5	**5**	
6	**9**	
7	**5**	
8	**6**	
9	**5**	
10	**6**	
11	**5**	
12	**3**	
13	**2**	
14	**4**	
TOTAL MARK		

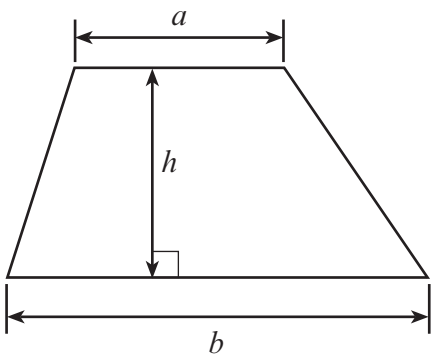
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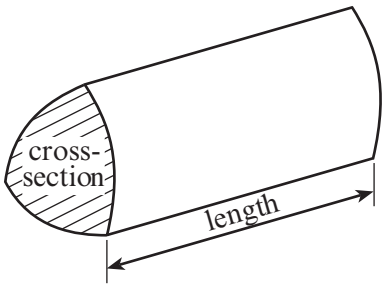
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Formula List

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



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1. *(a)* An election for the post of town mayor was held.
There were two candidates, S. Hill and F. Dodd.

(i) The result must be displayed on the local council's notice board, both in figures and in words.
Complete the Election Result sheet below by writing the number of votes for S. Hill in words and the number of votes for F. Dodd in figures.

Election Result

S. Hill: 20 608

.....

.....

F. Dodd: .....

Thirteen thousand and seventy nine

[2]

(ii) The local paper had a headline that gave the **total** number of people who voted, rounded **to the nearest 100**.

Complete the headline using figures.

.....

.....

.....

'Around ..... **voted in the election for mayor.'**

[2]

(b) In everyday life, how accurately would you want to give each of the measurements given below?

You may choose from the following.

millimetre (mm) **centimetre (cm)** **metre (m)** **kilometre (km)**

I would give the length of a football pitch to the nearest .....

I would measure the thickness of a letter to be posted to the nearest

.....

[2]

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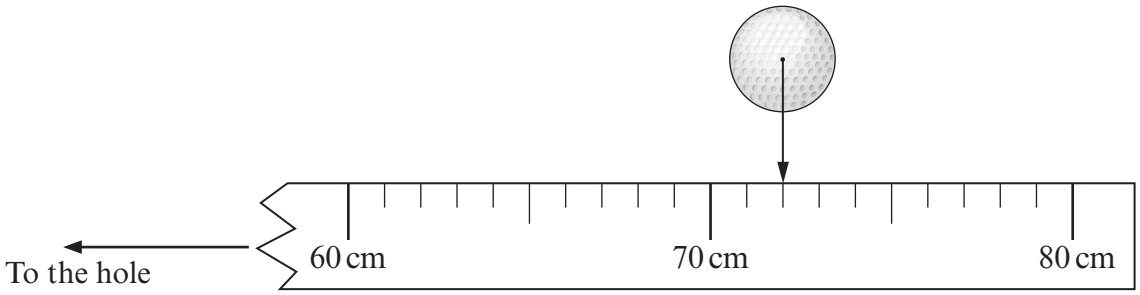
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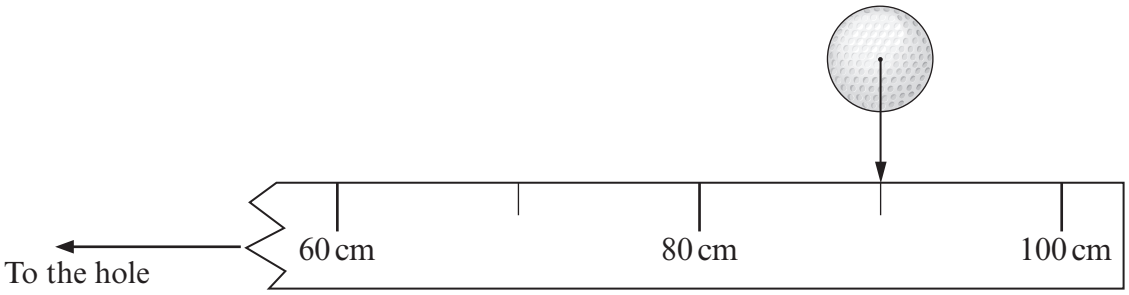
2. Laura and Colin have both hit their golf balls in a competition.

They use different measuring tapes to find how far **the centres** of their golf balls are from the hole.

Laura's measurement



Colin's measurement



(a) Write down how far each ball is from the hole.

Laura's ball ..... cm

Colin's ball ..... cm

[2]

(b) Whose ball is nearer the hole and by how many centimetres?

.....

.....

[1]

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3. In a competition a player gains 1 point for a win, $\frac{1}{2}$ a point for a draw and no points for a loss. Each player plays 10 games.

Calculate the total number of points gained by a player who loses 2 games, draws 5 games and wins all the rest.

.....

.....

.....

.....

[3]

4. The mid-day temperature at the summit of Snowdon was recorded over a seven-day period.

The recorded temperatures for five of those days are shown in the table below.

Tuesday was 2°C warmer than Monday.

Saturday was 6°C colder than Friday.

(a) Complete the table for Tuesday and for Saturday.

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Temperature	–4°C		0°C	2°C	1°C		–3°C

[2]

(b) What was the range of the recorded temperatures over the seven days?

.....

[1]

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5. A water company uses the following formula to calculate a customer's bill.

Water bill = Cubic metres used × £1.24 + Number of days × £0.08

A customer used **55 cubic metres** of water over a period of **181 days**.

Calculate this customer's **water bill**.

.....

.....

.....

.....

.....

.....

.....

.....

[5]

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6. *You will be assessed on the quality of your written communication in this question.*

A band was hired to play at the local hall.

The hall was hired for 4 hours at a cost of £20 per hour.
The band cost £150 to hire.
Tickets for the event cost £5 each and 128 tickets were sold.

Calculate how much money was spent, how much money was collected and the profit or loss made on the event.

.....

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[9]

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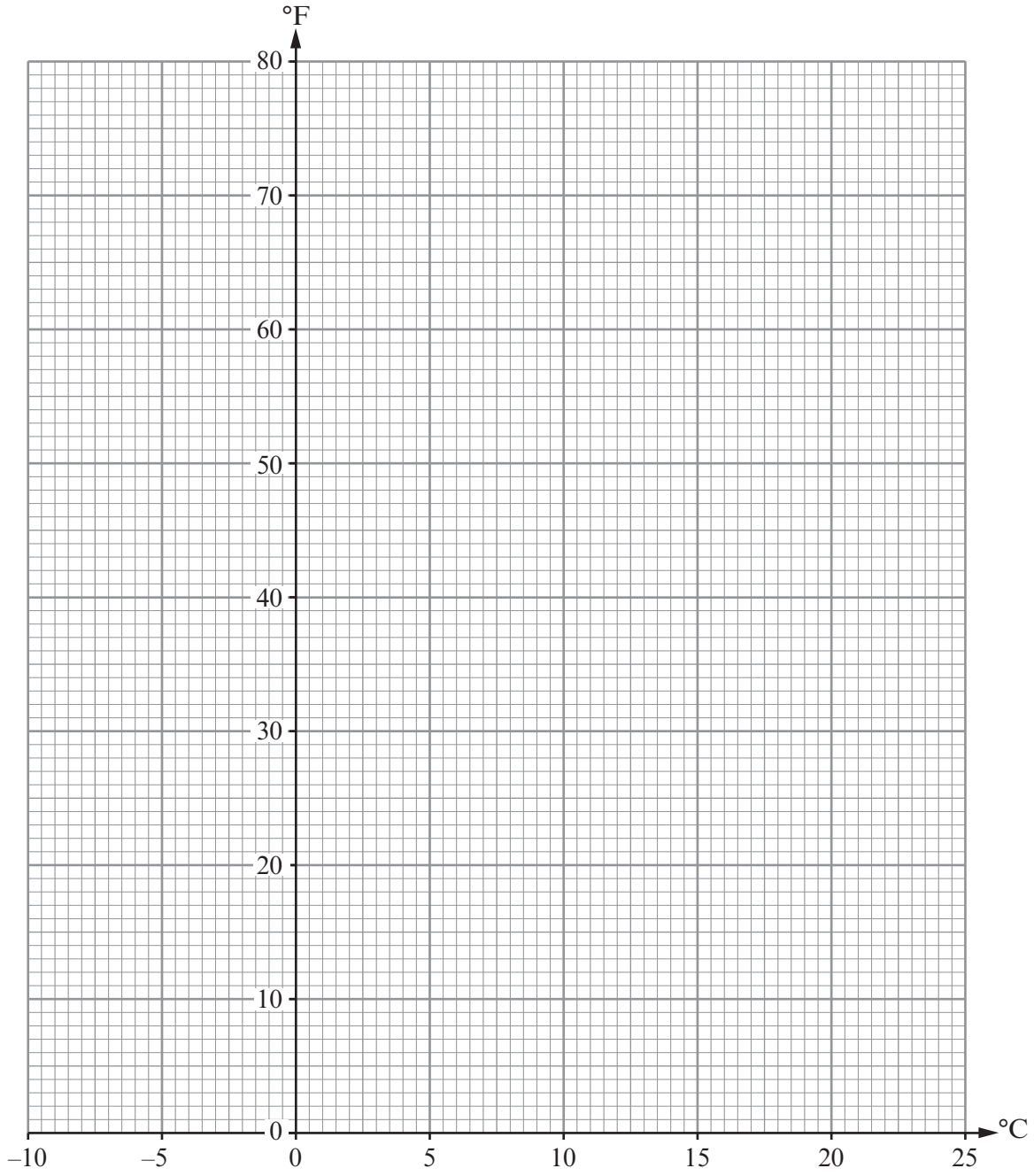
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7. The table below gives three temperature readings, both in Celsius (°C) and in Fahrenheit (°F).

°C	–5	5	25
°F	23	41	77

(a) On the graph paper below, draw a conversion graph between °C and °F. [3]



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(b) Water freezes at 0 °C under normal conditions.
Use your graph to find the temperature, in °F, at which water freezes under normal conditions.

.....

[1]

(c) Which is the higher temperature, 60 °F or 18 °C?
You must give a clear reason for your answer.

.....

.....

.....

[1]

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8. *(a)* A building site is a large rectangle with sides of length 1·4 km and 0·8 km.
Calculate the area of this site.

.....

.....

.....

.....

[2]

(b) A plan of this building site shows a triangular play area ABC.

The scale used for the plan is

1 cm represents 10 metres.

The actual distance between the points A, B and C are $AB = 100$ metres, $AC = 60$ metres and $BC = 75$ metres.
The point B is due East of point A.

Draw an accurate diagram to show where these points would be on the plan.
Point A has been put in for you.

[4]



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9. Shafira went on a trip to New York.

(a) She changed £800 into dollars ($) when the exchange rate was £1 = $1.57.
How many dollars did she receive?

.....

.....

.....

.....

[2]

(b) In New York she bought a coat for $199.
Using the same exchange rate, calculate the cost of this coat, giving your answer **to the nearest pound**.

.....

.....

.....

.....

.....

[3]

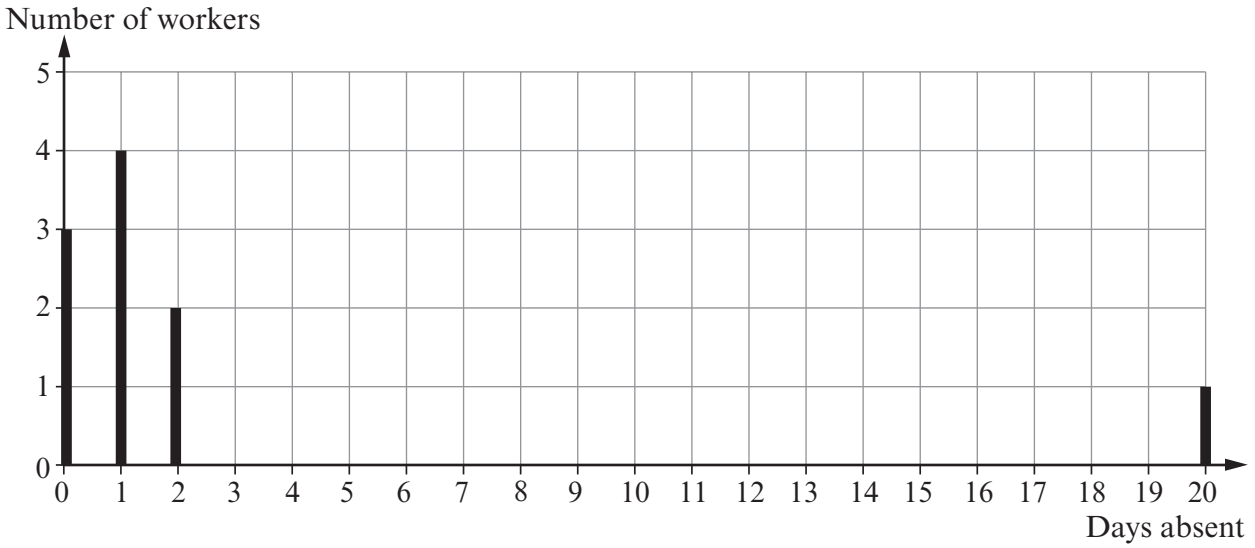
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Turn over.

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10. The diagram below shows the number of days each of 10 workers were absent from work last month.



(a) What is the modal number of days absent?

.....

[1]

(b) Calculate the mean number of days' absence of the workers.

.....

.....

.....

.....

[3]

(c) Which measure, the mode or the mean, best describes the number of absences in this case?
You must give an explanation for your choice.

.....

.....

.....

[2]

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11. A French bus company runs a service from Cherbourg to Rennes, a distance of 172 kilometres. Thierry catches the 13:45 bus at Cherbourg and arrives in Rennes at 16:15.

What was the average speed of the bus in **miles per hour**?

.....

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.....

[5]

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12. Gareth wants to test the following hypothesis.

'Most people spend more than 2 hours per night watching television.'

He plans to

- hand out a short questionnaire to people at the local fitness centre,
- ask the following questions,
  - (i) Do you think people watch too much television?
  - (ii) How much time do you spend watching television?
- ask them to post their completed questionnaire using a pre-paid envelope.

Write down **three** unfavourable comments about this plan.

1. .....

.....

.....

2. .....

.....

.....

3. .....

.....

.....

[3]

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13. Find $\sqrt{6 \cdot 8^3}$ to 3 significant figures.

.....

.....

[2]

14. Arnold went to buy some golf balls.
They were priced at £2 each, but a box of 15 balls could be bought at a discount price of £24.

What was the percentage discount being offered when buying a box of 15 balls?

.....

.....

.....

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.....

.....

[4]

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Question number	Additional page, if required. Write the question numbers in the left-hand margin

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GCSE MARKING SCHEME

MATHEMATICS - UNITISED

SUMMER 2012

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INTRODUCTION

The marking schemes which follow were those used by WJEC for the Summer 2012 examination in GCSE MATHEMATICS - UNITISED. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

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UNIT 1 (FOUNDATION TIER)

JUNE 2012 UNIT 1 Foundation	Mark	FINAL MARK SCHEME Comments
1. (a) (i) Twenty thousand six hundred and eight. 13 079. (ii) 33 700	B1 B1 B2	Ignore incorrect spelling. F.T. their votes in figures for F. Dodd. B1 for sight of 33687 (or an accurate F.T. total)
1. (b) (Football pitch) metre (Thickness of letter) millimetre	 B1 B1	Accept any unambiguous indication of correct choice.
2. (a) 72 90 (b) Laura's by 18(cm)	B1 B1 B1	 F.T. their measurements.
3. Indicates that 3 games are won. (2 × 0 +) 5 × ½ + 3 × 1 = 5½ ISW	B1 M1 A1	This may be implied. Two out of 0, 2½ and 3 AND added gains an M1. F.T. their number of winning games if > 0.
4. (a) Tue Sat – 2(°C) – 5(°C) (b) 7(°C)	B2 B1	B1 for each. F.T. from their table. Do not accept –7(°C).
5. 55 × (£)1.24 OR 55 × 124(p) (£)68.2(0) OR 6820(p) 181 × (£)0.08 OR 181 × 8(p) (£)14.48 OR 1448(p) (Water Charge =) (£)82.68 OR 8268(p)	M1 A1 M1 A1 A1	 F.T. their amounts only if using consistent units.

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JUNE 2012 UNIT 1 Foundation	Mark	FINAL MARK SCHEME Comments
6. (Hire of hall) $4 \times$ (£)20 = (£)80 (Total cost =) (£)230 128 × (£)5 (Income =) (£)640 (Profit =) (£)640 – (£)230 = Profit of (£)410 Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', £ being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	M1 A1 A1 M1 A1 M1 A1 QWC 2	F.T. 150 + 'their 80'. F.T. their values. Must indicate 'Profit' (or 'Loss' if so on F.T.). QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar
7. (a) Plotting all three points correctly. Line drawn through their points. (b) 32. (c) 18(°C) AND a clear reason given.	P2 L1 B1 B1	P1 for 2 correct plots. A correct line implies P2. F.T. their **three** plots. Allow curve or 'dog leg' only if P2 not gained. F.T. their line. Allow ± ½ 'small square'. Some **correct** use of their graph required. For an accurate graph (or no graph) 18°C needs to be equated to 64°F to 65°F OR 60°F needs to be equated to 15°C to 16°C. Do not accept 'its higher on the line' unless their line has been clearly marked at 60°F and 18°C.
8. (a) (Area =) 1·4 × 0·8 = 1·12 (km^2)	M1 A1	
8. (b) Position of point B due east of point A. AB = 10cm, AC = 6cm and BC = 7·5 cm.	 B1 B3	***Use overlay***. *Do not penalise those who use their own point A.* Allow ± 2°. B1 for each correct length. Allow ± 2mm. There is no requirement to join the points together. *Treat a consistent use of a different scale as a misread.*
9. (a) 800 × 1·57 = ($)1256	M1 A1	
9. (b) (Cost of coat =) 199 ÷ 1·57 = (£)126.7(5...) (To nearest pound =) (£)127	M1 A1 A1	 F.T. their amount.

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JUNE 2012 UNIT 1 Foundation	Mark	FINAL MARK SCHEME Comments
10. (a) (Mode =) 1 (day absent)	B1	Allow B1 for 1 day and 4 workers. B0 for 4 workers.
(b) (0 × 3) + 1 × 4 + 2 × 2 + 20 × 1 (28)	M1	For the intent to multiply values by their frequencies and then add.
÷ 10	m1	
= 2·8	A1	
(c) A valid reason given e.g. 'Only one worker was absent for more than 2·8 days'. 'Most workers were absent for 0,1 or 2 days'. 'Applies to the majority'. 'Most common one'.	M1	Do not accept e.g. '2·8 is not a full day' or 'It is simpler' or 'It is more accurate' or 'It is clearer', unless accompanied by a valid and acceptable response.
(The) Mode	A1	'The Mode' chosen with no valid reason is M0A0. If 'Mean' chosen then M0A0 whatever reason given.
11. Sight (time taken) 2hrs 30min or 2·5(hrs)	B1	Allow 2:30, 2.30, 2 30 and 2·3(0). Also allow 150(min).
(Speed km.ph) 172 / 2·5	M1	F.T. 'their time taken' in hours. Use of 2·3 is M1A0 (but does imply previous B1).
= 68·8 (k.p.h)	A1	Ignore incorrect units at this stage.
68·8 × 5/8	M1	F.T. their speed in km.ph. Allow M3 for 172 / 2·5 × 5/8.
= 43 (mph)	A1	F.T. answers should be accurate to at least 1d.p. *Alternative method.* Sight (time taken) 2hrs 30min. B1 172 × 5/8 M1 =107·5 A1 107·5 / 2·5 M1 F.T. 'their 107·5' = 43(mph) A1 and 'their time'.
12. Three different valid comments. e.g. 'Not representative of population'	B3	*Ignore irrelevant statements.* B1 for each different valid comment. Accept equivalent statements e.g. 'biased' (by age, gender or interest group). Do not give more than one mark for similar criticism(s).Reference to location should only be credited once.
'A leading question', 'What is meant by too much?' 'Not relevant to the hypothesis being tested' 'Asking an opinion (not fact)'		(criticisms of question (i))
'Does not specify over what period of time', 'Does not specify at what time (night or day)' 'Better with tick boxes'.		'is it per night or per week?' (a criticism of question (ii))
'Might get a poor response'		'people will forget or not bother (to post or complete them)'
13. 17·7	B2	B1 for 17·73(22.....) B1 for 17·70
14. Sight of (£)30 (15 individual balls) OR Sight of (£)1.60 (single ball in the box)	B1	
(Difference in price =) (£)6 OR 40(p)	B1	F.T. their amounts.
Use of 6/30 × 100 OR 40/200 × 100	M1	F.T. their price difference.
= 20(%)	A1	

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UNIT 1 (HIGHER TIER)

JUNE 2012 UNIT 1 Higher	Mark	FINAL MARK SCHEME Comments
1. (a) Valid reason, e.g. 'only those interested in drama will be leaving the theatre', 'Q3 assumes you won't return'.	B1	Accept reference to location or to Q3 *Ignore additional information given by candidates once a correct response has been given credit.*
1. (b) (i) / (ii) Any reference to two of the following. '50 appears in two boxes' 'no over 75 box' 'people might object to giving their age', 'too personal'.	B1 B1	*Ignore additional information given by candidates once a correct response has been given credit.* Do not accept 'not relevant' or 'different age gaps'.
1.(c) Valid reason, e.g. 'asks the same thing twice', 'vague', 'difficult to collect responses', 'people have to write answer', 'better to have tick boxes', 'biased', 'negative', 'leading question', 'taken for granted you won't return	B1	*Ignore additional information given by candidates once a correct response has been given credit.*
2. Sight of 9745 × 2·12 OR 90 × 12·4 (£)206.59(4) or 20659(.4)(p) (£)11.16 or 1116(p) (Cost without VAT) (£)217.75(4) or 21775·4(p) (Bill =) 217.75 × 1·05 or equivalent = (£)228.64 or 22864(p) Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', £, % being appropriate) • final answer in £ QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	M1 A1 A1 A1 M1 A1 QWC 2	Accept (£)206.60 or 20660(p) . Do not accept incorrect units but do allow £206.59p and £11.16p. F.T. 'their two amounts'. F.T. 'their cost' in £s or in pence. Allow ± 1p but answer must be a whole number of pence. QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar
3. Sight (time taken) 2hrs 30min or 2·5(hrs) (Speed km.ph) 172 / 2·5 = 68·8 (k.p.h) $68·8 \times \frac{5}{8}$ = 43 (mph)	B1 M1 A1 M1 A1	Allow 2:30, 2.30, 2 30 and 2·3(0). Also allow 150(min). F.T. 'their time taken' in hours. Use of 2·3 is M1A0 (but does imply previous B1). Ignore incorrect units at this stage. F.T. their speed in km.ph. Allow M3 for 172 / 2·5 × 5/8. F.T. answers should be accurate to at least 1d.p. *Alternative method.* Sight (time taken) 2hrs 30min. B1 172 × 5/8 M1 =107·5 A1 107·5 / 2·5 M1 F.T. 'their 107·5' = 43(mph) A1 and 'their time'.

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JUNE 2012 UNIT 1 Higher	Mark	FINAL MARK SCHEME Comments
4. Attempt at $\sum f \times x$ (8200000) Division by $\sum f$ (25000) (Mean cost =) (£)328	M1 m1 A1	 C.A.O.
5. 17·7	B2	B1 for 17·73(22.....) B1 for 17·70
6. Sight of (£)30 (15 individual balls) OR Sight of (£)1.60 (single ball in the box) (Difference in price =) £6 OR 40(p) Use of $\frac{6}{30} \times 100$ OR $\frac{40}{200} \times 100$ = 20(%)	B1 B1 M1 A1	 F.T. their amounts. F.T. their price difference.
7. $100 = 20 \times 4 + ½ \times a \times 4^2$. $a = \frac{100 - 20 \times 4}{4^2} \times 2$ $= 2{\cdot}5\ (ms^{-2})$	B1 B1 B1	For correct substitution. Allow for correct intent. C.A.O. Accept an embedded answer.
8. (a) Appropriate uniform scale on vertical axis. Line starts at (0, 200). Straight line with correct gradient (150 *l*/h). (b) 620(litres)	B1 B1 B1 B1	Must allow for all plots up to 6 hours. Need not start at 0. Accept plot at (0,200) if no line drawn. F.T. their graph ± ½ 'small square'.
9. Sight of 4913. (Volume of metal removed) $\pi \times 4^2 \times 17$ $= 854(\cdot5..)(cm^3)$ (volume of part =) $4913 - 854{\cdot}5$ $= 4058(\cdot5)$	B1 M1 A1 M1 A1	 Accept 853 to 856 inclusive OR 272π. F.T. 'their two derived volumes'.
10. (a) Least length = 4·45 Greatest length = 4·55 (b) Greatest length = $41 \times 4{\cdot}55$ = 186·55(cm) Indicates that 'smallest shelf' is 185(cm) A statement that the cubes will not fit	B1 B1 M1 A1 B1 E1	 Accept 4·54999...recurring. F.T. 'their greatest cube' only if > 4·5. Ignore other multiplications seen. This mark is dependent on M1 gained. F.T. logical statement. *Look out for logical thinking when working with values other than 4·55 and/or 185. Some, or possibly all, of the marks available in part (b) may be gained.* Values must remain consistent with the shelf not always being long enough for the award of the E1 mark. *Alternative method* *'Smallest shelf' = 185(cm)* *B1* *185 / 4·55* *M1* *= 40·6(....)* *A1* *Clear explanation that 40·6 < 41and so cubes are not certain to fit* *E1* *Alternative method* *'Smallest shelf' = 185(cm)* *B1* *185 / 41* *M1* *= 4·51(....)* *A1* *Clear explanation that 4·51 < 4.55and so cubes are not certain to fit* *E1*

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JUNE 2012 UNIT 1 Higher	Mark	FINAL MARK SCHEME Comments
11 104% ≡ (£)884 (Original investment) $\frac{884}{104} \times 100$ = (£)850	B1 M1 A1	Accept any indication.
12. $4 \div 3$ OR $4 \times \frac{1}{3}$ $\times 2\frac{1}{2}$ OR equivalent = 20/6(hrs) or equivalent OR 3·33(...)(hrs) OR 200(min) 3hrs 20min	M1 M1 A1 A1	Do not accept 20÷6 until it is evaluated. F.T. if at least one M1 and of equivalent difficulty. *If question is misread as 'It took Machine **A** 4 hours ....How long did it take Machine **B**.....?' award* *SC1 for (4 × 3) / 2½ or 4·8 hours and a further* *SC1 for 4hrs 48min.*
13 (a) Sight of (angle DAE =) 70°. (length of arc DE =) $70/360 \times 2 \times \pi \times 10$ 12·2(....) Perimeter = 62·2(.....)(m) (b) (area of rectangle =) 150(m^2) (area of sector =) $70/360 \times \pi \times 10^2$ (61·08..) Area of land = 211(·08..)(m^2)	B1 M1 A1 A1 B1 M1 A1	Seen or implied in calculations or on the diagram. F.T. 'their 70°' Their 12.2 + 50 F.T. 'their 70°' BUT must be the same as for (a).
14. (Volume of cone) $\frac{1}{3} \times \pi \times 19{\cdot}8^2 \times 15$ = 6158(·14..)(cm^3) '7 litre' or 7000(cm^3) (hemisphere required) $2/3 \times \pi \times r^3 = 7000$ $r^3 = \frac{7000 \times 3}{2 \times \pi}$ (3342) r = 14·95(..)(cm) (Diameter =) 29·9	M1 A1 B1 M1 m1 A1 A1	 Accept answers between 6155 and 6161. F.T. their volume in cm^3. F.T. their volume in cm^3 if not whole litre. Accept to 1dp but may lose final A1. F.T. 2 × 'their radius' to nearest mm. Pre approximation of their radius may result in A0. *If $4/3\pi r^3$ used allow* *SC1 for r = 11·86(..) and a further* *SC1 for d = 23·7*

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4351/01

MATHEMATICS (UNITISED SCHEME)
UNIT 1: MATHEMATICS IN EVERYDAY LIFE
FOUNDATION TIER

A.M. WEDNESDAY, 11 January 2012

$1\frac{1}{4}$ hours

ADDITIONAL MATERIALS

A calculator will be required for this paper.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **5**.

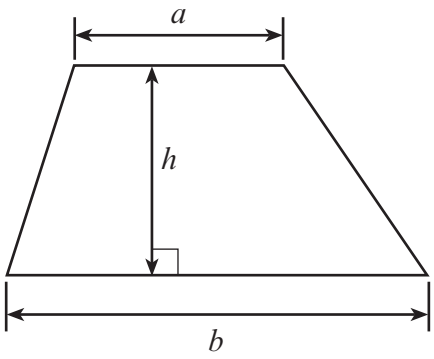
For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	**4**	
2	**5**	
3	**4**	
4	**6**	
5	**8**	
6	**4**	
7	**6**	
8	**4**	
9	**4**	
10	**3**	
11	**3**	
12	**3**	
13	**3**	
14	**4**	
15	**4**	
TOTAL MARK		

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010001

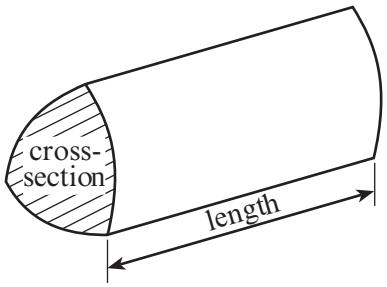
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Formula List

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



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Examiner only

1. *(a)* Hilary visits a garden centre.
She buys a wheelbarrow, 5 large pots and 12 bags of compost.

Complete the following table to show her bill for these items.

ITEM	COST
1 wheelbarrow	£76.99
5 large pots @ £6.35 each	
12 bags of compost @ £3 per bag	
TOTAL	

[3]

(b) She earns 1 point on her store card for every £10 she spends.

How many points will be added to Hilary's store card after paying the above bill?

.....

[1]

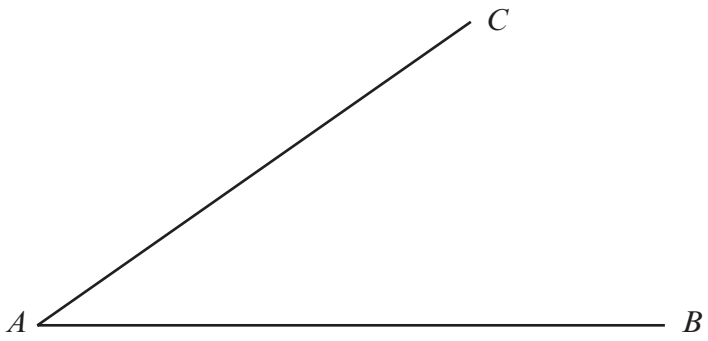
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2. The scale drawing below shows two straight paths AB and AC meeting at point A.

Scale: 1 cm represents 20 m



(a) Measure and write down the size of the angle between the two paths.

..... °

[1]

(b) Measure the length of the line AB and then calculate the actual length of the path AB.

Length of line AB .....

.....

.....

Length of path AB .....

[3]

(c) On the scale drawing above, draw a line from the end of the path at B to the mid-point of the path AC.

[1]

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Examiner only

3. Some carrots were collected from a vegetable garden.
Their lengths (to the nearest mm) are recorded below.

83	112	128	108	78	107	105	117	91	119	144
92	107	106	123	112	106	122	72	135	75	103

Using **equal** class intervals, complete the following table.

Length (mm)	70 to 89	90 to 109		130 to 149
Tally	////			
Frequency	4			

[4]

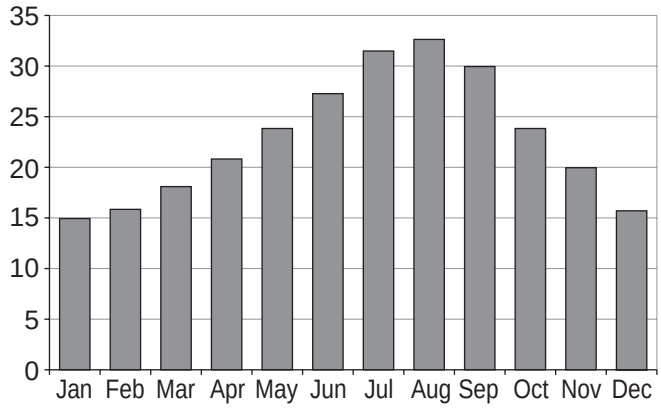
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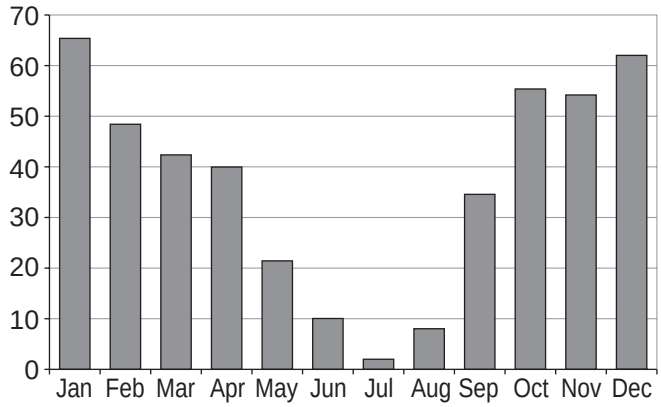
Examiner only

4. *(a)* A holiday magazine displays the following two graphs.

Average maximum daily temperature (°C) in Tunisia



Average monthly rainfall (mm) in Tunisia



(i) Which month has the highest average monthly rainfall?

.....

[1]

(ii) Which month would best suit a person going on holiday to Tunisia if they did not want the average maximum daily temperature to be over 25°C but hoped for as little rain as possible?

.....

.....

.....

.....

[1]

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Examiner only

(b) A group of friends went on holiday to Tunisia and hired a car to travel around the country.

The cost of hiring the car (in Tunisian dinars) is given by the formula

Hire cost = 50 dinars × Number of days + Fixed charge.

How much did they pay in dinars for hiring a car for 5 days if the fixed charge was 85 dinars?

.....

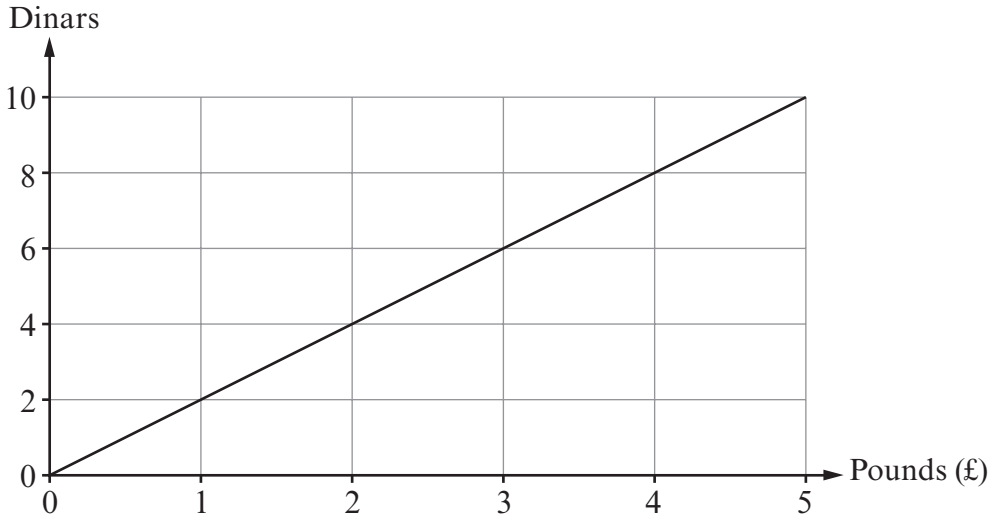
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.....

[2]

(c) One of the group has made a simple conversion graph, shown below, to help them convert pounds (£) into Tunisian dinars.

The group paid a total of 60 dinars for a meal.
Using the conversion graph, calculate how much this would be in pounds (£)?



.....

.....

.....

[2]

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5. *You will be assessed on the quality of your written communication in this question.*

A gas company wants to concrete a rectangular piece of land and then put a fence around it. The diagram below shows the lengths of the sides of this land.

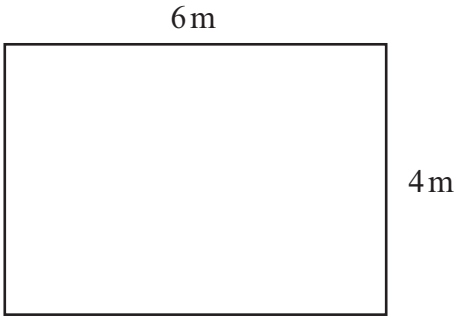


Diagram not drawn to scale

The fence costs £7 per metre.
The concrete costs £9 per square metre.

Calculate the total cost for the fence and the concrete.

.....

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.....

.....

[8]

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6. *(a)* Using the numbers

2 **3** **10** **15**

once only in each case, fill in the boxes so that the equations are correct.

(i) $\square + \square = \square - \square$ [1]

(ii) $\square \times \square = \square \times \square$ [1]

(iii) $\square \div \square = \square \div \square$ [1]

(b) Use **two** of the symbols

$+$ $-$ $\times$ $\div$

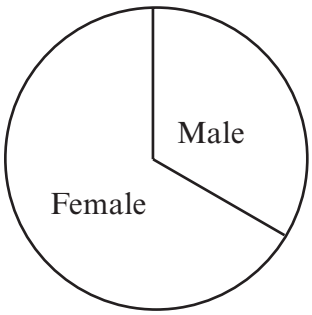
to make the following equation correct.

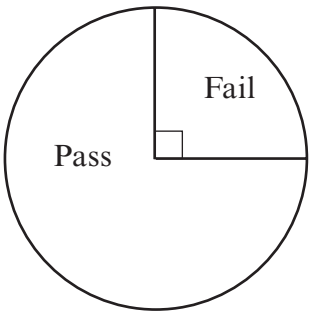
6 **3** $=$ **21** **7** [1]

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7. *(a)* The pie charts below give information about a group of students and their results in an end of year examination.





(i) What does the first pie chart tell you about the group?

.....

[1]

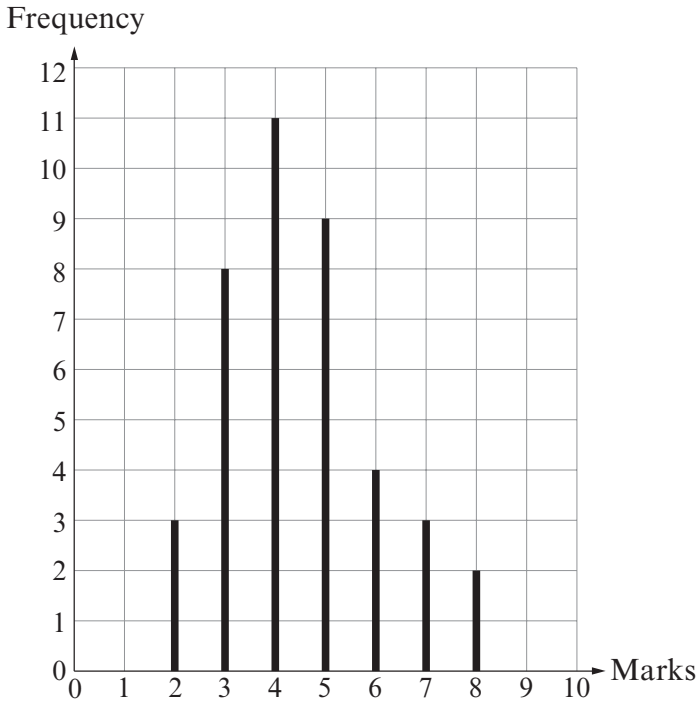
(ii) What percentage of the group failed the examination?

.....

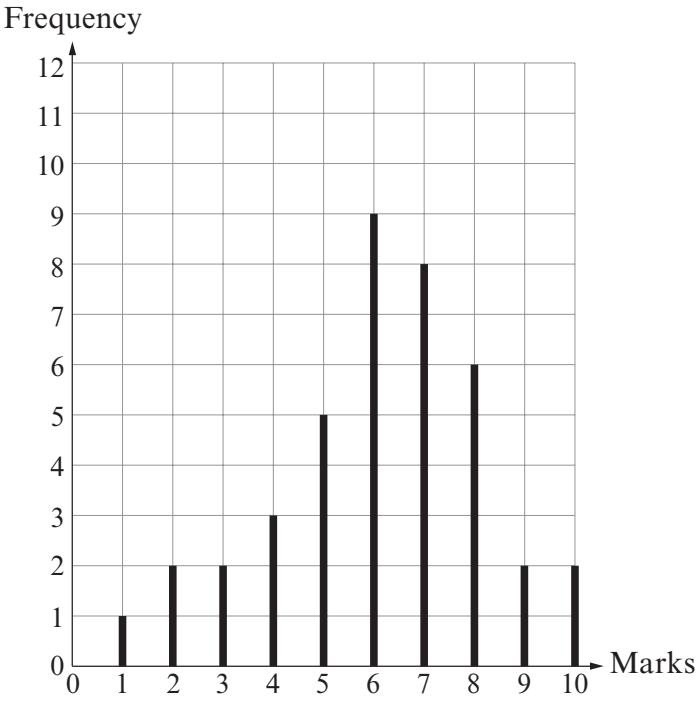
[1]

(b) The diagrams below show how a group of 40 pupils performed in their History test and in their Geography test.

History



Geography



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Compare the ranges of marks gained in the two tests.

.....

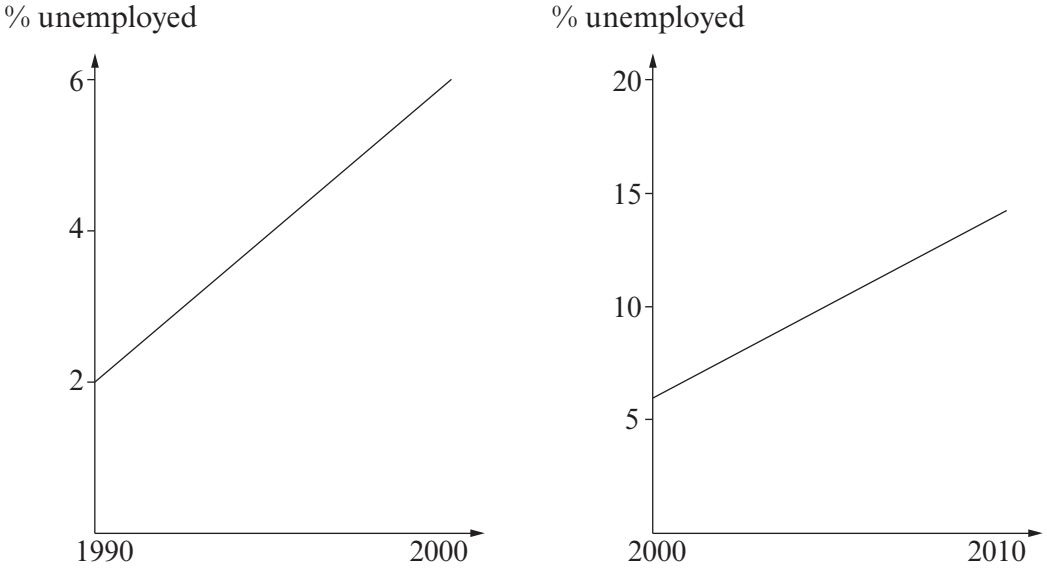
.....

.....

[2]

(c) A newspaper printed the diagrams shown below with the headline

'Changes in unemployment over two ten-year periods'



In what way could the information shown in the diagrams be misunderstood?

.....

.....

What is the reason for this?

.....

.....

[2]

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Examiner only

8.



Dining Table and 4 Chairs

Hire Purchase Price
Deposit: 15% of Cash Price
+ 36 monthly payments of £42

Calculate the total hire purchase price.

.....

.....

.....

.....

.....

.....

[4]

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9. Lucy went to a garage to buy diesel for her car.
She paid for her diesel and also bought a box of chocolates for £3.99, a daily newspaper for 48p and a bottle of screen wash priced at £2.35.

Later in the day when her friend asked how much diesel she had put in the car, Lucy had forgotten.
She did, however, remember that the diesel was priced at 140.9 pence per litre and that her total bill at the garage was £91.36.

How many litres of diesel had Lucy bought?

.....

.....

.....

.....

.....

.....

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.....

.....

[4]

Turn over.

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10. An agricultural college weighed the fruit produced from a certain tree. They did this each year for a period of 3 years.

The tree produced 225 kg of fruit in its first year.

Each year following, the weight of the fruit reduced by $\frac{1}{3}$ of that produced in the previous year.

Showing all your calculations, find how many kilograms of fruit the tree produced in the third year.

.....

.....

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.....

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.....

.....

[3]

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11. A survey was carried out to find whether more women than men visit the cinema.

The following two questions were asked.

Q1. What is your age?

Q2. How often do you visit the cinema?

Never	*1-2 times*	*3-5 times*	*5 or more times*
☐	☐	☐	☐

(a) For each question give **one** reason why it is not suitable.

Q1 .....

.....

Q2 .....

.....

[2]

(b) The survey was carried out by questioning people leaving a cinema one Wednesday afternoon.
Give **one** criticism on how the survey was carried out.

.....

.....

[1]

Turn over.

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12. Sian is driving along a road in Germany, which has a speed limit of 80 km per hour. She is driving at 55 mph.

By how much is her speed above or below the speed limit?

.....

.....

.....

.....

.....

.....

[3]

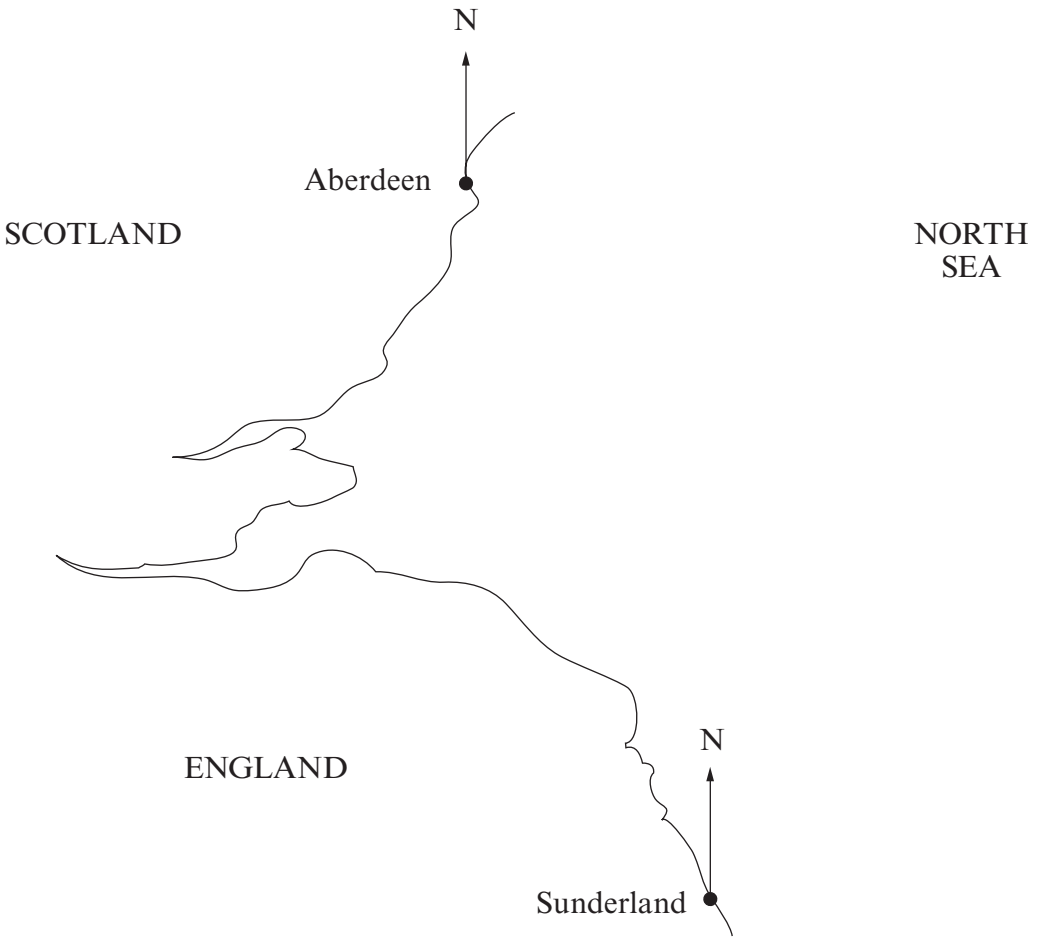
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13. An oil ship is sailing in the North Sea.
It is 150 km from Sunderland on a bearing of 065°.

Plot its position on the diagram below and give its bearing from Aberdeen.

Scale : 1 cm represents 25 km



The bearing of the ship from Aberdeen is .....

[3]

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Turn over.

Examiner only

14. Nine litres of water was poured into an empty cylindrical can, whose base radius is 12 cm.

What is the height of the water in the can, correct to the nearest cm?

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[4]

15. Irfon invests £4000 for 3 years at 3% per annum compound interest.

Calculate the value of his investment, correct to the nearest penny, at the end of the 3 years.

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[4]

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Question number	Additional page, if required. Write the question number(s) in the left-hand margin

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WJEC
CBAC

GCSE MARKING SCHEME

MATHEMATICS - UNITISED

JANUARY 2012

INTRODUCTION

The marking schemes which follow were those used by WJEC for the January 2012 examination in GCSE MATHEMATICS – UNITISED. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

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Unit 1 – Higher Tier	4
Unit 2 – Foundation Tier	7
Unit 2 – Higher Tier	12

Unit 1 – Foundation Tier

UNIT 1 Foundation Tier	✓	Mark	Comments
1. (a) (£76.99) (£)31.75 (£)36(.00) (Total) (£)144.74 (b) 14 (points)		 B1 B1 B1 B1	 Accept 3175p. Accept 3600p F.T. their amounts. F.T. their total bill.
2(a) $35^{(\circ)}$ 2(b) Sight of 8·3(cm) 8·3 × 20 = 166m		B1 B1 M1 A1	Allow ± 2°. Allow ±2mm. F.T. their '8·3'. For stated intent to multiply a length by 20. Must show correct units. Unsupported answer in the region 162 to 170 implies B1, M1. Also A1 if units given.
2(c) **Use overlay.** A line from end of path B to mid point of path AC.		 B1	Allow ±2mm for mid point. **Use overlay.** Do not penalise poorly drawn lines.
3. (70 to 89) (90 to 109) **110 to 129** (130 to 149) Using a tally convention. (4) 9 7 2		B1 B1 B2	Accept any unambiguous indication e.g. 110 – 129. Need not be accurate. Must show a total of at least 13 additional tallies. B2 for all three correct. B1 for 1 or 2 correct.
4(a) (i) Jan(uary).		B1	
4(a) (ii) May.		B1	
4(b) (Hire Cost =) 50 × 5 + 85 = 335 ISW		M1 A1	For correct substitution BUT M0 if e.g. 50×90 used or implied.
4(c) Correct strategy (£)30		M1 A1	E.g. Using '10 × 6TND' or '6 × 10TND' etc.

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UNIT 1 Foundation Tier	✓	Mark	Comments
5. (Perimeter or fence =) 20(m) (Cost of fence =) (£)140 (Area or concrete =) 6 × 4 = 24(m^2) (Cost of concrete =) (£)216 (Total cost =) (£)356 Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', '£', m and m^2 being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	B1 B1 M1 A1 A1 B1 QWC 2	F.T. 7 × their 'perimeter'. F.T. 9 × their 'area'. F.T their stated costs for the fence and the concrete. QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar.
6.(a) (i) A correct equation formed. (ii) A correct equation formed. (iii) A correct equation formed.		 B1 B1 B1	Must use given numbers once only in each case.
6(b) – ÷		B1	
7(a) (i) 'More girls than boys' or equivalent.		B1	Accept 'Twice as many girls as boys'. Do not accept 'more females passed'.
7(a) (ii) 25(%)		B1	¼ is B0.
7(b) Indication that the range of the marks in History is 6 and in Geography is 9		B2	Allow 'range in Geography is greater' or equivalent. B1 for ranges of 6 and 9 only, with no indication of which is which. OR B1 for 'History 2 to 8 and Geography 1 to 10' OR B1 for one correct range clearly attributed.
7(c) It might appear that the % increase is much greater for one period than the other because of the different scale used.		B2	B1 for comment on misleading visual appearance. B1 for comment on different scale used. Credit similar statements once only. *(Mark comments wherever they appear. Ignore other irrelevant comments.)*
8. 0·15 × (£)1240 + 36 × (£)42 = (£)186 (+) (£)1512 = (£)1698 ISW	✓ ✓ ✓ ✓	M1 B1 B1 A1	For complete method. For sight of 186 or implied in further calculation. For sight of 1512 or implied in further calculation. F.T. addition of their amounts. Correct answer gains all 4 marks.

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UNIT 1 Foundation Tier	✓	Mark	Comments
9. 91.36 – (total cost of three other items) = (£)84.54 or 8454p (Diesel bought =) (£)84.54 ÷ 1.409 = 60(litres) ISW	✓ ✓ ✓ ✓	M1 A1 M1 A1	M1 for attempt so do not penalise incorrect total cost OR use of 48 instead of 0·48. C.A.O. F.T. 'their £84.54' (this may be £91.36) Accept answers from a F.T. being rounded or truncated . SC1 for attempting to divide by 140·9. M1A0 for dividing by 1·41 or 1·4(0). M0A0 for dividing by 1·49
10. Repeated attempt to find 1/3 <u>and subtract</u> or 2/3 of two different amounts. (End of 2nd year) 150(kg) (End of 3rd year) 100(kg)		M1 B1 A1	M1 awarded for intent. Penalise use of decimal approximations to 1/3 or 2/3 once only. Penalise extra work –1*(unsupported 66.6.. implies this).*
11(a) Q1. A statement regarding e.g. 'not relevant', 'confidentiality', 'too personal' Q2. 'times not exclusive' 'over what period of time?'		 B1 B1	*Only mark answer given in relevant answer space* *Ignore other statements if B1 awarded.* For any equivalent statement. For any **one** of these, or equivalent statement.
11(b) A criticism regarding location or time.		B1	
12. 55 × 1·6 or equivalent. = 88 (km.p.h.) 8 (km.p.h.) (above)		M1 A1 A1	*Alternate method.* 80 × 0·625 M1 = 50(m.p.h.) A1 F.T. 'their 88'. 5(m.p.h.)(above) A1 ('*above' not required, but 'under' is A0.)* *An unsupported final answer requires units.* *Unsupported 5(m.p.h.) <u>under</u> is M0A0A0*
13. **Use overlay** Position of ship 065° from Sunderland. Position of ship 6cm from Sunderland. Correct three-figure bearing given		 B1 B1 B1	 Allow ± 2°. Allow ± 2mm. (*Ship must be at sea for this B1)* F.T. their ship's position. Allow ± 2°. **Use tools.**
14. Use of Volume = $\pi \times 12^2 \times$ height. Height = Volume / $\pi \times 12^2$ (Height of water =) 19·88 to 19·91 inclusive. 20(cm)	✓ ✓ ✓ ✓	M1 m1 A1 A1	Allow 900, 90 or 9 as intent to use volume. C.A.O. F.T. 'their height' if of equivalent difficulty and gives an answer that is > 0.
15. 4000 <u>120</u> 4120 <u>123.6(0)</u> 4243.6(0) <u>127.30(8)</u> 4370.90(8) (£) 4370.91 ISW		B1 M1 A1 A1	For the evaluation of a correct 3% OR Sight of 1·03 (360 and 4360 imply use of 3× 120 and gain B1) For attempting to find 3 different 3%. OR $4000 \times 1{\cdot}03^3$. F.T. one error if of equivalent difficulty. Treat 2 years as a misread.

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Unit 1 – Higher Tier

UNIT 1 Higher Tier	✓	Mark	Comments
1. Repeated attempt to find 1/3 and subtract ,or 2/3 of two different amounts. OR Repeated attempt to find 20% and subtract , or 80% of two different amounts. (Tree A =) 100(kg) (Tree B =) 128(kg) Tree B by 28(kg)		 M1 A1 A1 A1	*Treat going on for an extra year as a misread.* *Treat consistent increase as a misread.* M1 awarded for intent. C.A.O. C.A.O. F.T. their amounts. SC1 for Tree B by 45(kg) [(200–40–40) –(225–75–75)]
2(a) (i) Intent to multiply values by frequencies and add up $(0 \times 11 + 1 \times 25 + 2 \times 4 + 3 \times 2 + 30 \times 2)$ their $\sum fx \div 44$ $= 2{\cdot}25$		M1 m1 A1	 CAO (but ignore if 2·25 seen and then rounded to 2)
2(a) (ii) Some indication that this is not typical for the majority of the workforce.		B1	E.g. 'Most are absent fewer than 2 days', '30 days skew things'.
2(b) Some reference to most being in the first group or that most of the group intervals would be empty. OR Some reference to loss of raw data or that the answer will be an estimate		B1	Do not accept that '4 is not a factor of 30' for a B1.
3. **Use overlay** Position of ship 065° from Sunderland. Position of ship 6cm from Sunderland. Correct three-figure bearing given		 B1 B1 B1	 Allow ± 2°. Allow ± 2mm. (*Ship must be at sea for this B1)* F.T. their ship's position. Allow ± 2°. **Use tools.**
4. $55 \times 1{\cdot}6$ or equivalent. = 88 (km.p.h.) 8 (km.p.h.) (above)		M1 A1 A1	*Alternate method.* $80 \times 0{\cdot}625$ M1 = 50(m.p.h.) A1 F.T. 'their 88'. 5(m.p.h.)(above) A1 (*'above' not required, but 'under' is A0.)* *An unsupported final answer requires units.* *Unsupported 5(m.p.h.) under is M0A0A0*
5(a) (i) 5(%)		B1	
5(a) (ii) No because the graph show (%) growth not actual numbers.		B1	Accept equivalent valid statements.
5(b) E.g. 'No scale (so might not be 'huge'). 'Only two plots (so might not be 'steady'). 'Not clear how 'burglaries' are defined'.		B2	B1 for each valid reason. Credit similar reasons once only.
6 Sight of 8 hours difference in time. Sight of take off time as 18:10 (London) Correct addition of 11hrs 20 min. (Time in Los Angeles) 21:30 Tuesday		B1 B1 B1 B1	 May be given as 10:10 (Los Angeles) F.T. their 'initial' time. (Accept e.g. 05:30 but not 29:30) Must give both time and day. *These marks may be implied in their answer(s).* *E.g. (2h30min + 11h20min) '+' 07:40 =) 21:30 gains B3. 'Tuesday 21:30' on its own gains B4*

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UNIT 1 Higher Tier	✓	Mark	Comments
7. (Taxable Income =) (£)44,850	✓	B1	For sight of 44850.
(Tax on first £35000 =) (£)7000	✓	B1	For sight of 7000.
(Additional Tax =) 0·4 × (£)9850 = (£)3940	✓ ✓	M1 A1	F.T. 0·4 × ('their 44850' − 35000).
(Total Tax =) (£)10,940	✓	A1	F.T. 'their 7000' + 'their 3940'.
Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', £ , % being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	✓ ✓	QWC 2 7	QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar.
8. Sight of 1m (being represented by) 10cm AND of 1yd (being represented by) 9cm 1/10 metre = 1/9 yard or equivalent e.g. '1yd = 0·9m' (1 metre =) 1·1(yards)		B1 M1 A1	Allow '1m = 10cm ' or '1yd = 9cm' etc. Allow ± 0·1cm in measurement of 10cm and 9cm. F.T. their line measurements.
9. 60% ≡ (£)192 (Original price) $\frac{192}{60} \times 100$ = (£)320		B1 M1 A1	Accept any indication. Or equivalent e.g. 192 / 0·6.
10. Correct substitution into formula. Making 'Annual Bonus' subject of formula. Using consistent units of '£' or 'pence'. (Annual Bonus =) (£)30.26 or 3026 (p)	✓ ✓ ✓ ✓	M1 m1 m1 A1	Do not penalise 'mixing' units at this stage. Allow missing brackets but not incorrect use of + and −. Allow also (£)30.24 or 3024(p) and (£)30.25 or 3025(p) Allow also (£)30.27 or 3027(p) and (£)30.28 or 3028(p)
11. Strategy to find (Fractional or % or actual) return for either currency. (HK$) 0·95(08..) or 95(·08..%) (Return) (Yen) 0·93(60..) or 93(·60..%) (Return) More is lost on the Yen		M1 A1 A1 A1	E.g. $\frac{11.6}{12.2}$ (×100) or $\frac{127.2}{135.9}$ (×100) OR using £x £x × $\frac{11.6}{12.2}$ or £x × $\frac{127.2}{135.9}$ If x = £100 return = £95(.08) If x = £100 return = £93(.60) F.T. their calculated amounts.

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UNIT 1 Higher Tier	✓	Mark	Comments
12. $4 \times \frac{2}{6}$	✓	M1	Or equivalent e.g. × 1/3 or ÷ 3.
$\times \frac{15}{3}$	✓	M1	Or equivalent e.g. × 5 or ÷ 0·2.
= 20/3 (hrs)	✓	A1	C.A.O. or equivalent e.g. 6·66...(hrs). *Alternate presentation.* *Tanks* *Pumps* *Hours* *6* *15* *4* .... M1 for 'two' steps. .... M1 for next 'two' steps. .... *2* *3* ***20/3*** A1 C.A.O.
= 6hrs 40min	✓	A1	(Watch out for compensating errors) F.T. conversion from 'their 20/3' only if an M1 gained and is of equivalent difficulty.
13. Sight of 67·5(m) AND 68·5(m)	✓	B1	Allow B1 for sight of 6750 AND 6850.
Sight of 35·5(cm) AND 36·5(cm)	✓	B1	Allow B1 for sight of 0·355 AND 0·365.
(Least number required) $\frac{6750}{36{\cdot}5}$ or equivalent	✓	M1	F.T. 'their least corridor' / 'their biggest tile'. (*with consistent units used)*
185	✓	A1	Must be a whole number of tiles. Unsupported 184 gains M1A0
(Greatest number required) $\frac{6850}{35{\cdot}5}$ or equivalent	✓	M1	F.T. 'their biggest corridor' / 'their smallest tile'. (*with consistent units used)*
193	✓	A1	Must be a whole number of tiles BUT do not penalise again if already penalised once before. Unsupported 192 gains M1A0 If no M marks gained, allow SC1 once for a 'correct' method but using 'mixed' units, e.g. 67·5/36·5.
Both parts, (a) and (b) marked together			
14 (a) $\frac{\text{Angle AOB}}{360} \times 2 \times \pi \times 18 = 66$		M1	For correct substitution.
$A\hat{O}B = \frac{66 \times 360}{2 \times \pi \times 18}$ or equivalent		A1	
$210^{(°)}$		A1	For an answer that rounds or truncates to 210.
(b) (Area =) $\frac{150}{360} \times \pi \times 18^2$		M1	F.T. 'their 210'.
$= 424(\cdot 11..)(cm^2)$		A1	Accept values that are correct to 3 sig.fig. SC1 for 593(.76) or 594.
15. Sight of $\pi \times r^2 \times 5$ AND $\frac{1}{3} \times \pi \times r^2 \times 18$	✓	B1	
$\pi \times r^2 \times 5 + \frac{1}{3} \times \pi \times r^2 \times 18$	✓	M1	Allow only if equivalent to kr^2.
$(11\pi r^2) = 1244$	✓	m1	
$r = \sqrt{(1244 / 11\pi}$	✓	A1	Incorrect manipulation of equation is A0,A0,A0.
$r = 6$(cm)	✓	A1	
(Diameter =) 12(cm)	✓	A1	F.T. their radius.

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Surname	Centre Number	Candidate Number
Other Names		0

WJEC CBAC

New GCSE

4351/01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: MATHEMATICS IN EVERYDAY LIFE

FOUNDATION TIER

A.M. MONDAY, 14 November 2011

$1\frac{1}{4}$ hours

ADDITIONAL MATERIALS

A calculator will be required for this paper.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **7***(a)*.

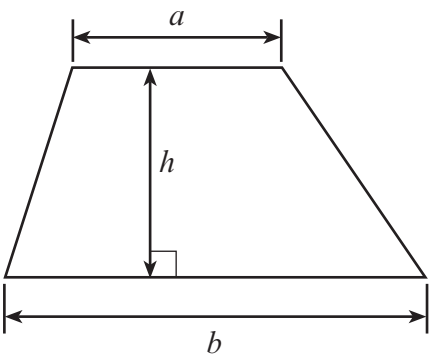
For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	**3**	
2	**6**	
3	**3**	
4	**2**	
5	**4**	
6	**5**	
7	**8**	
8	**2**	
9	**5**	
10	**5**	
11	**6**	
12	**3**	
13	**6**	
14	**3**	
15	**4**	
TOTAL MARK		

4351 010001

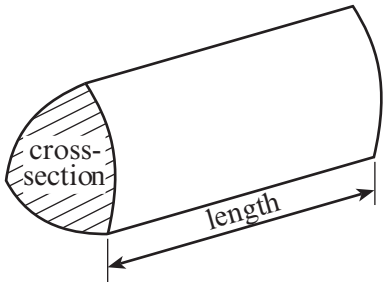
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Formula List

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length

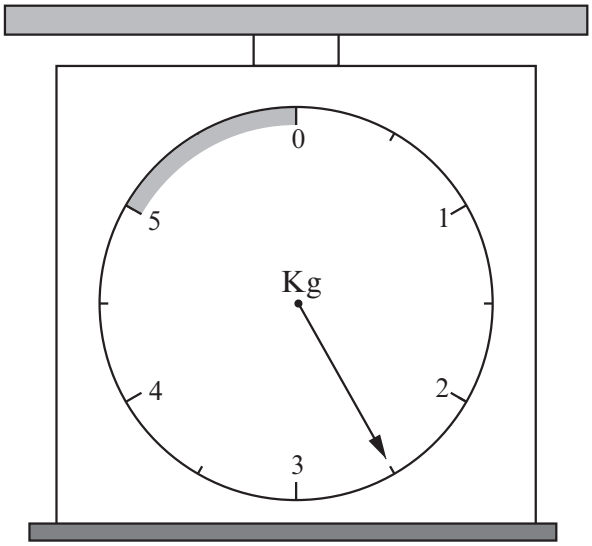


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1. Apples are sold in a fruit market at £1.30 per kg.

What would be the cost of the apples being weighed on the scales shown below?



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[3]

4351 010003

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2. Forty members of a youth club were asked their opinion on what main colour should be used when decorating their hall.

The colour choices available were blue (B), cream (C) and yellow (Y).

The answers given are recorded on the grid below.

Y	C	B	C	C	B	B	C	Y	C
B	C	B	C	B	C	Y	Y	C	B
C	B	C	C	B	Y	C	C	C	Y
Y	Y	C	Y	C	B	Y	B	B	C

(a) Complete the frequency table below.

Colour	Tally	Frequency
Blue		
Cream		
Yellow		

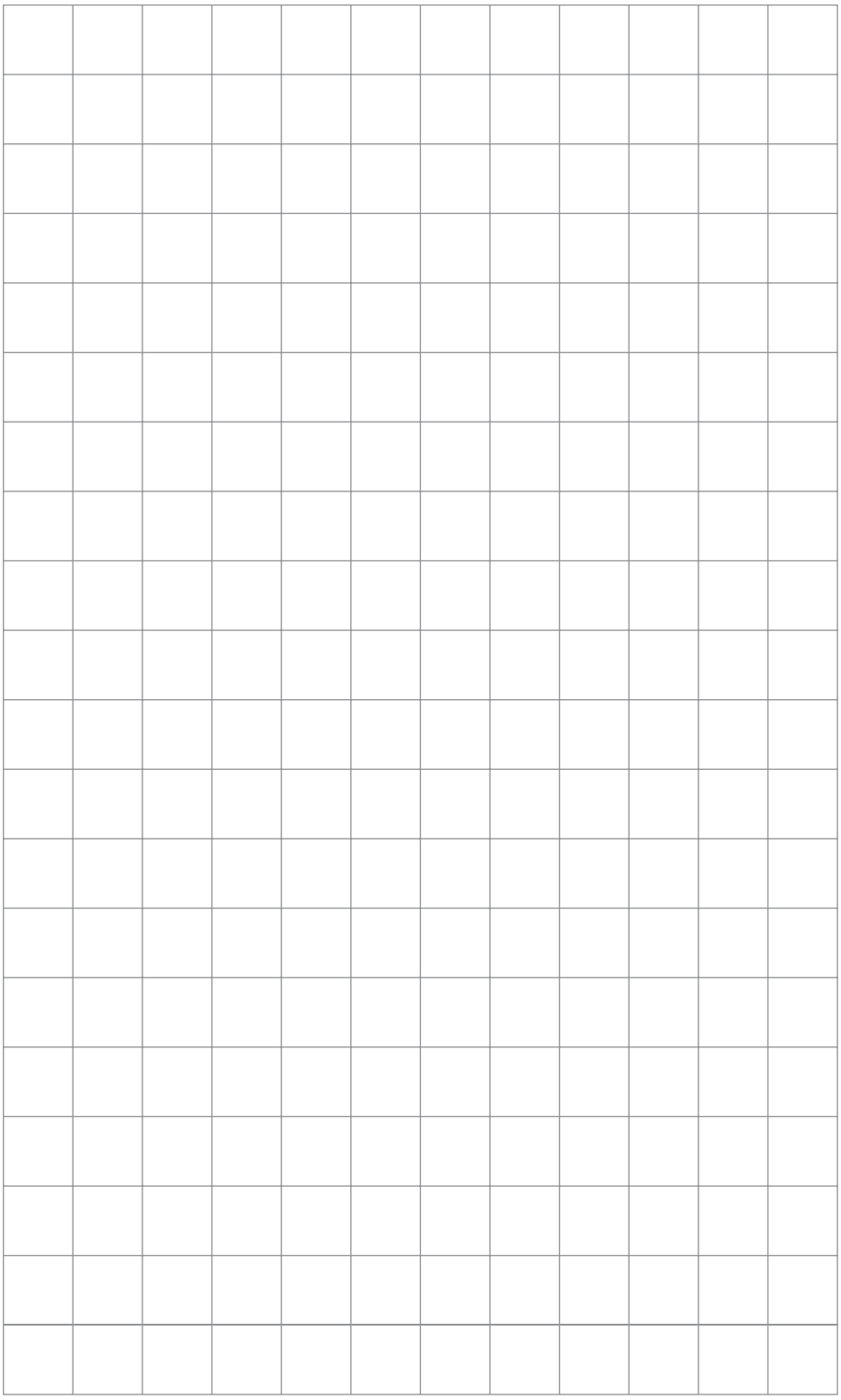
[2]

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(b) Draw a bar chart to display the results.

[4]



4351 010005

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3. On March 10th, the temperatures at midnight in five European cities were measured and the results were as follows.

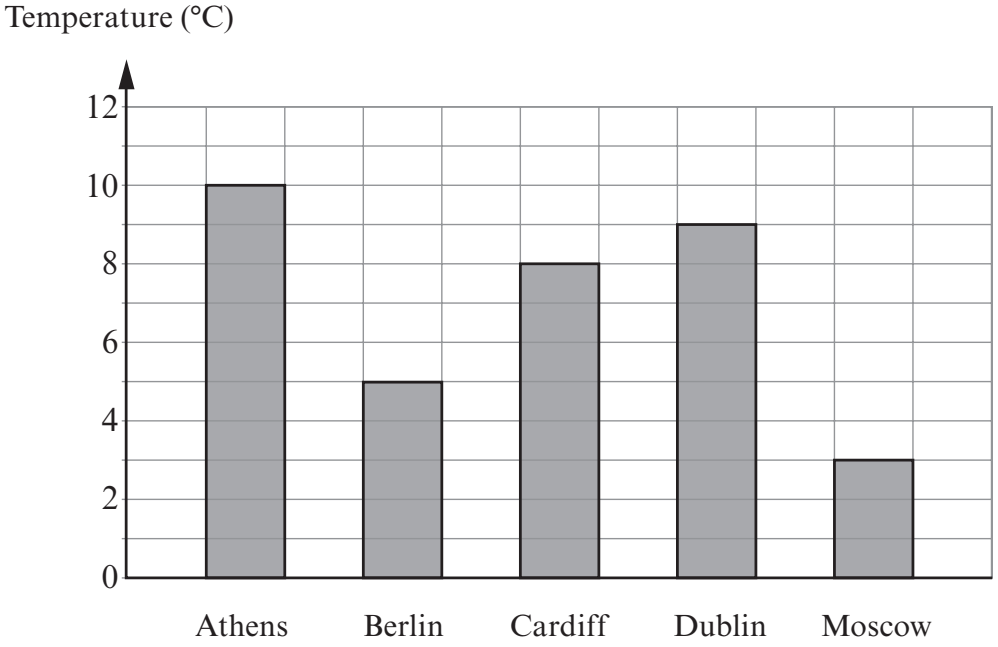
Athens 2°C, Berlin –3°C, Cardiff 0°C, Dublin 3°C, Moscow –7°C.

(a) List the cities in order of the temperatures recorded at midnight, starting with the lowest.

....

[1]

On the following day, March 11th, the temperatures at mid-day, for the same five cities, are shown on the diagram below.



(b) What is the difference in temperature, at mid-day on March 11th, between Athens and Moscow?

..... °C

[1]

(c) By how many degrees has the temperature risen in Berlin between midnight on March 10th and mid-day on March 11th?

..... °C

[1]

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4. You are going to a concert that will end at 9:30 p.m..
You plan to leave to catch a bus home after the concert ends.
It will take you twenty minutes to get from your seat in the concert hall to the bus station.

Buses to get you home leave the bus station at the following times.

18:35 19:35 20:35 21:05 21:35 22:05 22:35

Write down the time of the earliest bus that you can catch and how long you will have to wait at the bus station.

.....

.....

.....

Bus time .....

Waiting time .....

[2]

4351 010007

5. A grocery shop sells peaches for 34p each.

Find the greatest number of peaches you can buy for £5.
How much change should you receive?

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[4]

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Examiner only

6. When servicing a heating boiler and radiators, a plumber knows that the time she will take is given by the formula

Time = 2 hours + 30 minutes per radiator.

She charges her customers a call-out charge of £25, plus £30 per hour.

How much should a customer be charged for servicing a heating boiler and nine radiators?

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[5]

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Examiner only

7. An airline allows a maximum weight limit of 20 kg on each passenger's luggage.

(a) *You will be assessed on the quality of your written communication in this part of the question.*

A passenger has luggage weighing 18 kg.
He wishes to add an item weighing 1200 g to his luggage.
Find out how much under or over the airline's weight limit this will make his luggage.

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[5]

(b) Anton's luggage weighs 50 lb. (1 kg is approximately 2·2 lb.)
Showing all your calculations, decide whether his luggage is under or over the airline's weight limit.

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.....

[3]

Turn over.

STEMUP.CO.UK

Examiner only

8. Calculate $5 \cdot 6^2 + \sqrt{30}$, giving your answer to three significant figures.

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[2]

9. *(a)* What percentage of pupils in Class A are girls when $\frac{3}{5}$ of the pupils are boys?

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.....

[2]

(b) Class B has 25 pupils of which 44% are girls.
How many girls are there in this class?

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.....

.....

[2]

(c) Can you tell whether or not there are more girls in Class B than in Class A?
You must give a reason for your answer.

.....

.....

.....

[1]

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Examiner only

10. *(a)* A factory manufactures cuboids, each measuring 8·5 cm by 6·6 cm by 3·7 cm.

Calculate the volume of one of these cuboids, giving the units of your answer.

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[3]

(b) The cuboids are packed into rectangular boxes.
Each box is 85 cm long, 66 cm wide and 37 cm high.

What is the maximum number of cuboids that can be packed in each box?

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.....

.....

[2]

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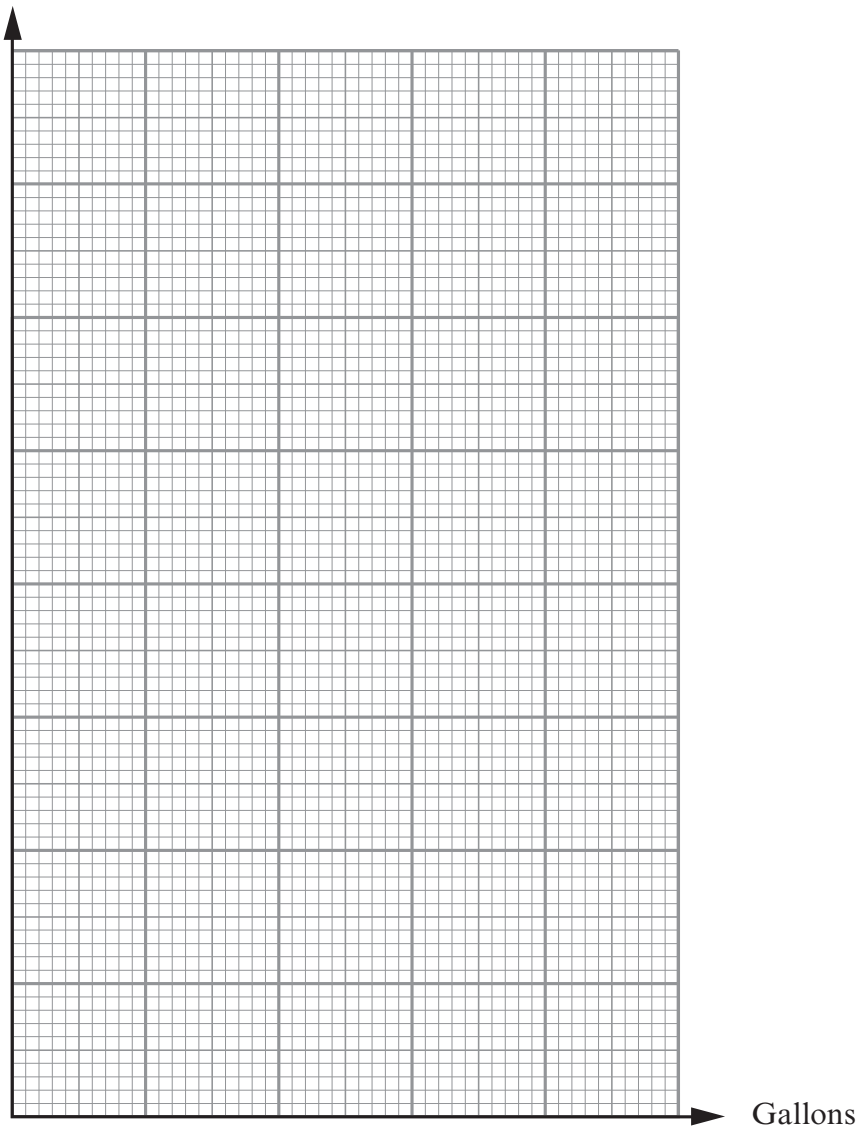
Examiner only

11. The table below gives three measurements in both gallons and litres.

Gallons	0	9	16
Litres	0	41	73

(a) On the graph paper below, use the data in the table to draw a conversion graph between gallons and litres.

[4]



(b) Use your graph to find an estimate for 350 litres in gallons.

.....

.....

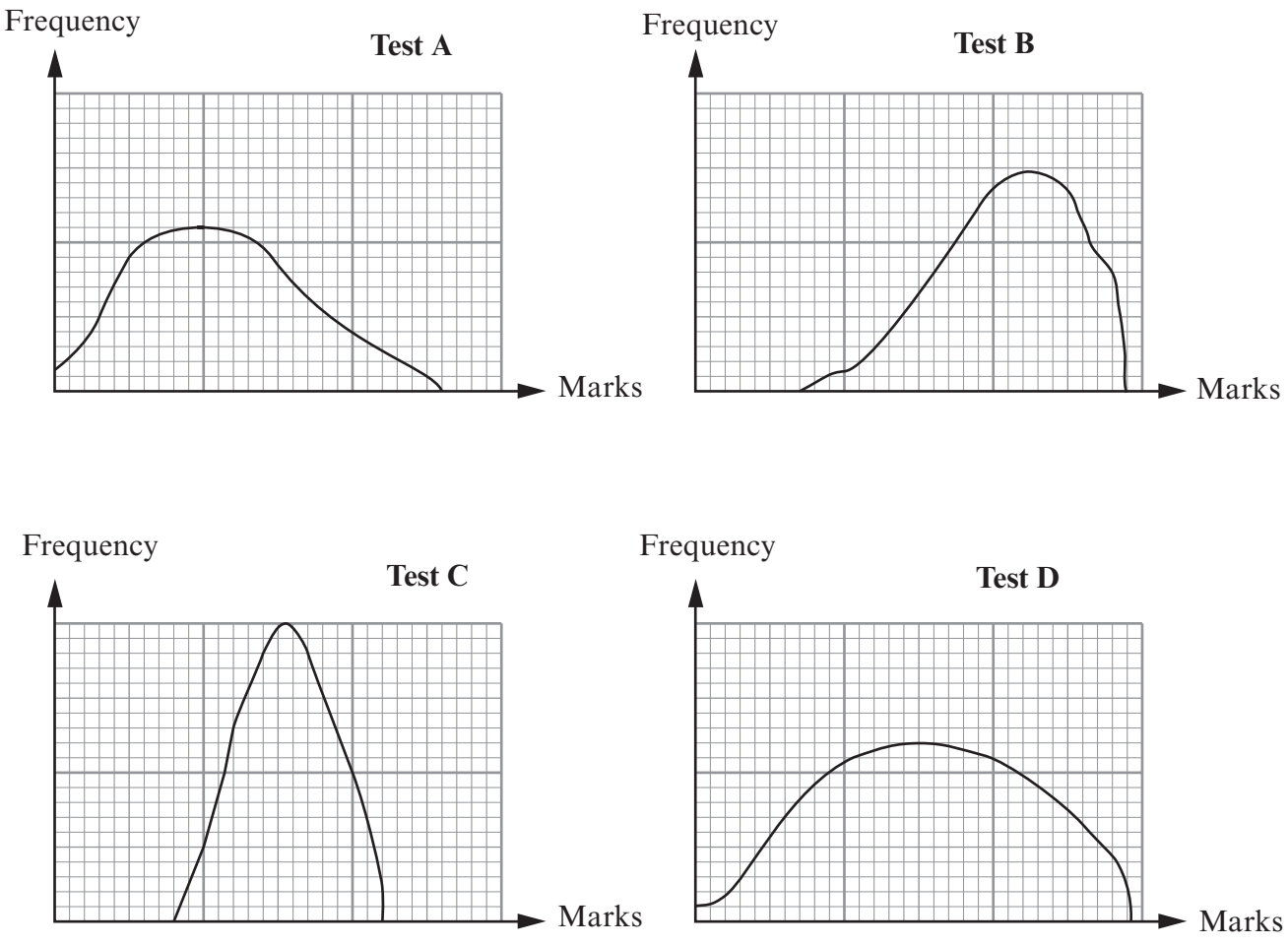
.....

[2]

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12. A group of students sat four separate tests, Test A, Test B, Test C and Test D, as part of their course.

Using the data from the marks scored in each of these tests the following sketch graphs were drawn. The same scales are used in each graph.



Complete the following statements.

"Most of the students gained high marks in Test ..... ."

"The range of students' marks was smallest in Test ..... ."

"Most of the marks were low in Test ..... ."

[3]

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13. As part of her training, an athlete runs for 5 minutes and then walks for 1 minute. She repeats this without stopping for a period of one hour.

Her average running speed is 18 km per hour.
Her average walking speed is 6 km per hour.

Calculate how many kilometres she will complete during the hour.

[6]

14. Idris has been awarded a salary increase from £23 500 per annum to £23 970 per annum.

By what percentage has his salary increased?

[3]

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Examiner only

15. Zala has bought a sack of potatoes and a bottle of cooking oil.

The sack holds 20 kg of potatoes measured correct to the nearest kilogram.

The bottle contains 750 ml of cooking oil measured correct to the nearest 10 ml.

Complete the table below to show the least and greatest weight of potatoes and the least and greatest amount of cooking oil that Zala could have bought.

	Least Value	Greatest Value
Potatoes	..... kg	..... kg
Cooking oil	..... ml	..... ml

[4]

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GCSE MARKING SCHEME

MATHEMATICS - UNITISED

NOVEMBER 2011

INTRODUCTION

The marking schemes which follow were those used by WJEC for the November 2011 examination in GCSE MATHEMATICS - UNITISED. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

	Page
Mathematics Unit 1 - Foundation Tier	1
Mathematics Unit 2 - Foundation Tier	4
Mathematics Unit 1 - Higher Tier	7
Mathematics Unit 2 - Higher Tier	10

UNIT 1 - FOUNDATION TIER

NOVEMBER 2011 UNIT 1 Foundation	Mark	FINAL MARK SCHEME (19/11/11) Comments (Page 1)
1. Sight of 2·5(kg) OR 2½(kg) 2·5 × (£)1.3(0) = (£)3.25	B1 M1 A1 3	F.T. 'their scale reading' × (£)1.3(0)
2. (a) Blue 12 Cream 18 Yellow 10	B2	For all three correct. B1 for one (or two) correct. Allow unambiguous indication in either 'Tally' or 'Frequency' column (Frequency column takes precedence).
(b) Blue, Cream and Yellow along one axis.	B1	**Or** indicated on the bars themselves. Accept B,C and Y. Ignore widths of bars.
Uniform scale starting at 0.	B1	B0 for ambiguous placing of numbers between grid lines.
Three bars at correct heights	B2 6	B1 for two correct heights. **F.T.** their frequencies. If no scale assume one square to represent a frequency of 1. Mark heights on uniform scale that does not start at 0 (e.g. starts at 1) accordingly.
3. (a) Moscow, Berlin, Cardiff, Athens, Dublin. (b) 7(°C) (c) 8(°C)	B1 B1 B1 3	Accept unambiguous correct order e.g. –7,–3, 0, 2, 3. Accept –7. B0 for -8
4. 22:05 OR 10.05(p.m.)	B1	Accept any unambiguous indication that the correct time has been chosen.
15(min) or ¼ (hour)	B1 2	Accept 45(min) or ¾ (hour) if 2235 or 10.35p.m. given in first part.
5. 5 ÷ 0·34 or 500 ÷ 34 (= 14·7....) = 14 (peaches)	M1 A1	Accept any attempt to find how many 34s in 500.
(change =) (£)5 – 14×0·34	M1	F.T. their number of peaches only if greater than 1 and less than 14.
= (£) 0.24	A1 4	Accept 24(p). Allow £0.24p but <u>not</u> 0.24p.
6. (Time =) (2 +) 9 × 30(min)	M1 M1	Sight of 9 × 30 gains M1 BUT make sure that it is 'Time' that is being found. So, for example, 9 × £30 or 25 + 270 will be M0 as 'Money' is implied.
= (2 +) 9 × ½ (hr)	A1	Sight of 4½(hrs) or 4hr 30min. gains both M marks. May be implied in work that shows understanding of correct relationship between hours and minutes.
= 6½(hrs) OR 6hrs 30min		Accept rounding up to nearest whole hour above.
(Charge=) (£)25 + 6½ × (£)30	M1	F.T. 'their time <u>given in hours</u>' OR 'their time rounded to the nearest whole hour above'.
= (£)220	A1 5	SC1 for (£)195 (call-out charge not included)

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NOVEMBER 2011 UNIT 1 Foundation	Mark	FINAL MARK SCHEME (19/11/11) Comments (Page 2)
7. (a) 18 + 1·2 OR 18000 + 1200 (Total weight =) 19·2(kg) OR 19200(g) 0·8(kg) (under) OR 800(g) (under) Look for • spelling • clarity of text explanations and correct units shown • the use of notation (watch for the use of '=', '+' being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer (b) 50 ÷ 2·2 OR 20(kg) = 20 × 2·2 (lbs) = 22(·727...) or 23 = 44(lbs) Luggage is over weight limit.	M1 A1 A1 QWC2 <

NOVEMBER 2011 UNIT 1 Foundation	Mark	FINAL MARK SCHEME (19/11/11) Comments (Page 3)
11. Labelling litres and uniform scale on vertical axis Uniform scale on horizontal axis Plotting at least two correct points. Correct line drawn Any correct strategy, e.g 10 times value at 35 litres. A correct answer <u>for their line.</u>	B1 B1 P1 L1 M1 A1 6	 *P0,L0 if no attempt at uniform scaling.* <u>+</u> '½ small square'. The origin may be one of the points. Correct line implies P1L1. M0 if inappropriate scale used. E.g. 350 litres on scale. F.T. their line. Allow M1,A1 for unsupported answers between 76 and 78 inclusive or if graph not used.
12. B C A	B1 B1 B1 3	
13. Showing a strategy to find total 'running time' and total 'walking time' OR use of km/min. Runs for 50min AND Walks for 10min. Use of Distance = Time × Speed Runs 18 × 50/60 (= 15km) Walks 6 × 10/60 (= 1km) (Distance =) 16 (km)	S1 B1 M1 m1 m1 A1 6	E.g. 'Running time' + 'walking time' = 60 minutes. OR 'Ten repeats of 5min running and 1min walking' is enough for S1B1 Allow this M1 even if time in minutes and speed per hr. F.T. their 'running time' if less than 60minutes. F.T. their 'walking time' if less than 60minutes and not equal to 'running time'.
14. $\frac{23970 - 23500}{23500} \times 100 = 2(\%)$	M1 m1 A1 3	*Look out for those who incorrectly use 23970 as a denominator (giving an answer of 1·96....%) which is then approximated to 2%. M0m0A0.*
15. Least Value 19·5 745 Greatest Value 20·5 755	 B4 4	B1 for each correct entry. Accept 20·49 recurring but not 20·49. Accept 754·9 recurring but not 754·9.

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UNIT 1 - HIGHER TIER

NOVEMBER 2011 UNIT 1 Higher	Mark	FINAL MARK SCHEME (19/11/11) Comments (Page 1)
1. (£) 24 × 1·2 OR (£)24 + 24 × 0·2 = (£)28.8(0) (£)28.8(0) ×¾ OR (£)28.8(0) – 28.8(0) ×¼ = (£)21.6(0)	M1 A1 M1 A1 4	F.T. their '24 + VAT' (Must be greater than 24). OR (£)24(.00) ×¾ OR (£)24.(00) – 24.(00) ×¼ M1 = (£)18.(00) A1 (£)18 × 1·2 OR (£)18 + 18 × 0·2 M1 F.T. 'their (£)18'. = (£)21.6(0) A1
2. Correctly drawn and labelled.	B4 4	'Correct' angles taken as given below (inclusive). Conservative 167° to 172°, Labour 141° to 145°, Liberal Democrats 29° to 34° and Others 14° to 18°. *(As total not a multiple or factor of 360 allow greater tolerance than the usual ± 2°.)* B3 for 4 correct angles drawn but not labelled correctly. B2 for 2 or 3 correct angles drawn and labelled. B1 for 1 correct angle drawn and labelled. If no B marks gained. M1 for sight of using a correct method to find an angle or percentage.
3. Three different valid comments. e.g. 'Not representative of whole school' 'Small sample' 'Might not get a truthful answer' 'Does not specify over what period of time', 'Might get a poor response' 'Use boxes to show times'.	B3 3	B1 for each different valid comment. Accept equivalent statements e.g. 'biased' (by age, gender or ability). 'not confidential' (a criticism of question (i)) 'is it per night or per week?' (a criticism of question (ii)) 'pupils will forget (to hand them in)' *Do not give more than one mark for similar criticism(s).*
4. (£)800 × 2·08 = 1664 (NZ dollars) 270 (NZ dollars on return) 270 ÷ 2·25 = (£)120 Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of units being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	M1 A1 B1 M1 A1 QWC2 7	F.T. 'their 1664' – 1391 AND truncated. F.T. 'their return dollars' even if not multiple of 10. QWC2. Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar.

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NOVEMBER 2011 UNIT 1 Higher	Mark	FINAL MARK SCHEME (19/11/11) Comments (Page 2)
5. B C A	B1 B1 B1 3	
6. Showing a strategy to find total 'running time' and total 'walking time' OR use of km/min. Runs for 50min AND Walks for 10min. Use of Distance = Time × Speed Runs 18 × 50/60 (= 15km) Walks 6 × 10/60 (= 1km) (Distance =) 16 (km)	S1 B1 M1 m1 m1 A1 6	E.g. 'Running time' + 'walking time' = 60 minutes. OR 'Ten repeats of 5min running and 1min walking' is enough for S1B1 Allow this M1 even if time in minutes and speed per hr. F.T. their 'running time' if less than 60minutes. F.T. their 'walking time' if less than 60minutes and not equal to 'running time'.
7. $\frac{23970 - 23500}{23500}$ × 100 = 2(%)	M1 m1 A1 3	*Look out for those who incorrectly use 23970 as a denominator (giving an answer of 1·96....%) which is then approximated to 2%. M0m0A0.*
8. π × 50 + 100 = 257(·07...) (nearest 10 metres =) 260	M1 M1 A1 B1 4	*(Note for '+100' and not '100'.)* F.T. for A1 and B1 only if at least one M1gained and lengths are dimensionally correct and π used. F.T. for equivalent work to nearest 10 metres. SC2 for 130. SC1 for 128·5(..0) [Using 50m as diameter]
9. (a) $15 \times \frac{1200}{800}$ $\times \frac{6}{5}$ = 27 (people) (b) 800 ÷ (15 × 6) OR 1200 ÷ (27 × 5) (which is less than 10) so 'NO'. *A correct conclusion must be unambiguously stated or implied.*	M1 M1 A1 B1 4	Or equivalent e.g. × 1·5 or ÷ 0·66(6...). Or equivalent e.g. × 1·2 or ÷ 0·83(3...). C.A.O. *Alternate presentation.* *Scarves* *Time* *People* *800* *6* *15* .... Award M1 for one correct step .... Award M1 for next correct steps .... *1200* *5* ***27*** A1 C.A.O. (Watch out for compensating errors) FT their 27 Also 15 × 6 × 10 (required) (which is more than 800) . OR 27 × 5 × 10 (required) (which is more than 1200).
10. (a) (60/4) × 60 × 60 ÷ 1000 = 54(km/h) (b) Recognising that time could be 4·5(seconds) $\frac{60 \times 3600}{4{\cdot}5 \times 1000}$ = 48(km/h)	M1 M1 A1 B1 M1 A1 6	For converting 'per second' to 'per hour'. For converting metres to kilometres. C.A.O. F.T. their 'time' only if greater than 4(seconds). A0 if greater than 50(km/h) on F.T.

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NOVEMBER 2011 UNIT 1 Higher	Mark	FINAL MARK SCHEME (19/11/11) Comments (Page 3)
11. 2116 equivalent to 92(%) implied. $\frac{2116 \times 100}{92}$ = 2300(kg)	S1 M1 A1 3	Allow 2116 = 92(%) Or equivalent.
12. Realising that 24 cards must be considered in solution. (Expected length =) 24 × 8 + 10 = 202(cm) (Maximum 'error' =) 24 × 0·1 (= 2·4) (Least length =) 199·6 AND (Greatest length =) 204·4	B1 M1 A1 M1 A1 5	Any use of 24 e.g. 24 × 8 or 24 × 0·1 or 24 × 1. C.A.O. Accept 24mm only if units given. C.A.O. *Alternate method* 24 overlaps B1 Least length = 250 – 24 × 2·1 M1 = 199·6(cm) A1 C.A.O. Greatest length = 250 – 24 × 1·9 M1 = 204·4(cm) A1 C.A.O. *If no marks gained, then SC2 for 197·5 and 202·5.* *SC1 for either 197·5 or 202·5.*
13. Sight of ¼ × π × 8^2 OR ½ × 8^2 (Area segment =) ¼ × π × 8^2 – ½ × 8^2 = 18·2(65..)(cm^2)	B1 M1 A1 3	Implied by 50·2.... and 32 or ½ × 8 × 8 × Sin $90^{(°)}$ C.A.O. Accept 18·2 to 18·3 inclusive.
14. (Volume of hemisphere. =) ⅔ × π × 9^3 ('Height' of cone =) 15(cm) (Volume of shape =) ⅔ × π × 9^3 + ⅓ × π × 9^2 × 15 = 2799(·15..) (cm^3) (Volume of pyramid =) ⅓ × 60^2 × 120 (Height of 'small' pyramid =) 90(cm) (Volume of shape =) ⅓ × 60^2 × 120 – ⅓ × 45^2 × 90 = 83250 (cm^3) (Number for re-cycling =) $\frac{50000 \times 2799}{83250}$ = 1682	B1 B1 M1 A1 B1 B1 M1 A1 M1 A1 10	Look for sight of 1526·8(...) for this B1. Both B marks may be implied from volume calculations. F.T. 'their hemisphere volume' and 'their cone height'. *(The formula ⅓ × π × 9^2 × 'their height' must be used for the M1 to be awarded)* Allow 2797 to2801. *(Look out for those who multiply by 50000 at this stage)* Look for sight of 144000 for this B1. Both B marks may be implied from volume calculations. F.T. 'their pyramid volume' and 'their height for the small pyramid'. *(The formula ⅓× 45^2 × 'their height' must be used for the M1 to be awarded)* F.T. their two calculated volumes. *(The 50000 might have already been considered.)* Must be given to the nearest whole number above.

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Candidate Name	Centre Number	Candidate Number
		0

WJEC CBAC

New GCSE

4351/01

MATHEMATICS (UNITISED SCHEME)

UNIT 1: MATHEMATICS IN EVERYDAY LIFE

FOUNDATION TIER

P.M. MONDAY, 13 June 2011

1 $\frac{1}{4}$ hours

ADDITIONAL MATERIALS

A calculator will be required for this paper.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **4**.

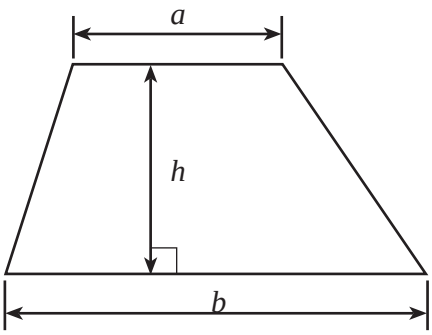
For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	**4**	
2	**6**	
3	**4**	
4	**8**	
5	**3**	
6	**4**	
7	**4**	
8	**4**	
9	**8**	
10	**3**	
11	**3**	
12	**3**	
13	**7**	
14	**4**	
TOTAL MARK		

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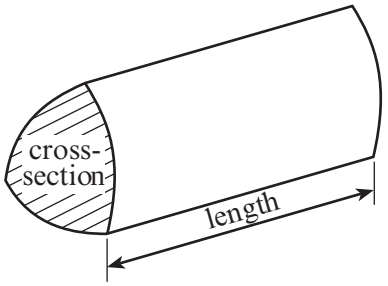
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Formula List

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



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Examiner only

1. The result for the election of a town councillor was as follows.

Candidate	Votes Gained
Mrs. G. AMBROSE	582
Ms. J. DAVIES	406
Mr. S. KHAN	512
Mr. F. SMITH	238

(a) Write in words the number of votes Ms. J. Davies got.

.....

[1]

(b) How many people voted?

.....

.....

[1]

(c) How many more votes did Mr. Khan get than Mr. Smith?

.....

.....

[1]

(d) How many votes did Mrs. Ambrose get to the nearest 100?

.....

[1]

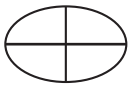
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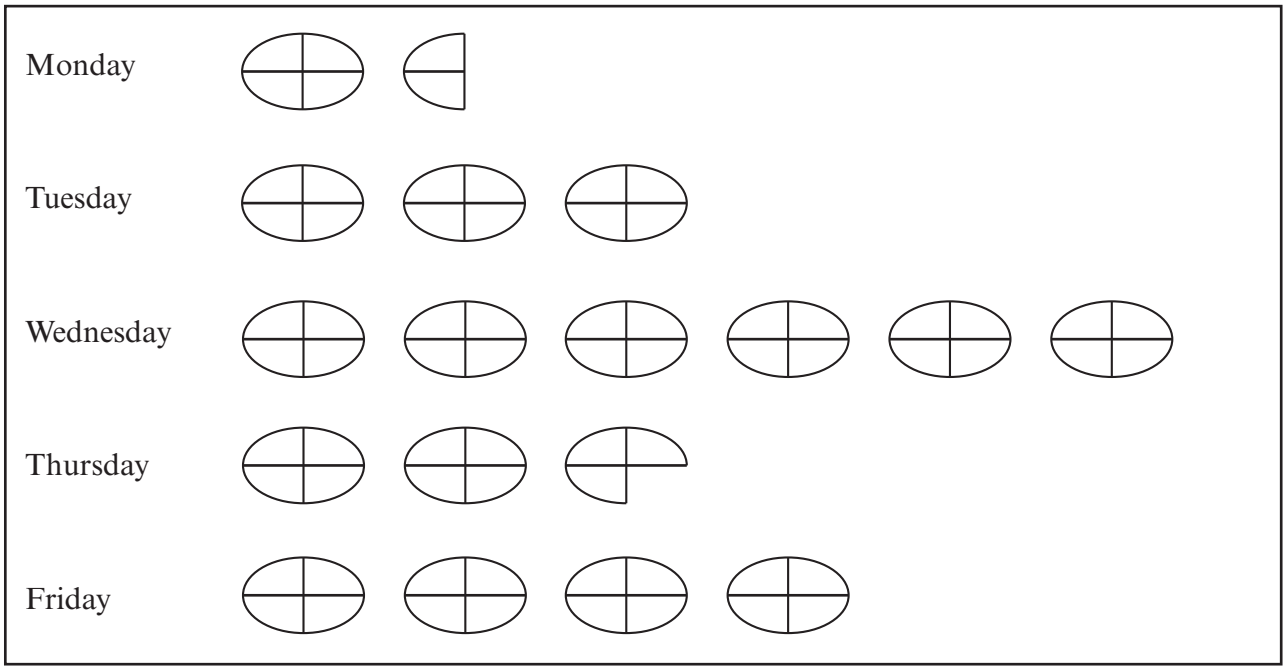
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2. Fresh eggs are delivered to a café each day.

The pictogram below records how many eggs were delivered each day from Monday to Friday.

The symbol  represents 24 eggs.



(a) (i) How many eggs were delivered on Tuesday?

.....

[1]

(ii) How many eggs were delivered on Monday?

.....

[1]

(iii) How many more eggs were delivered on Friday than on Thursday?

.....

[1]

(iv) On which day do you think the café expected most customers?

.....

[1]

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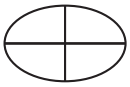
Examiner only

(b) On Saturday the café had a delivery of 5 dozen eggs (1 dozen = 12).

(i) Calculate the number of eggs that were delivered on Saturday.

.....

[1]

(ii) Using the same symbol  to represent 24 eggs,

show what the pictogram would be for Saturday.

Saturday

[1]

4351 010005

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3. An advert for gardening work is shown below.

GORGEOUS GARDENS

Any job small or large

Payment charge

PAYMENT CHARGE = NUMBER of HOURS × £9 + COST of MATERIALS

(a) How much would you pay for five hours work when the cost of the materials used was £13.99?

.....

.....

.....

.....

[2]

(b) Alice paid 'Gorgeous Gardens' £97 for eight hours work.
What was the cost of the materials used?

.....

.....

.....

.....

[2]

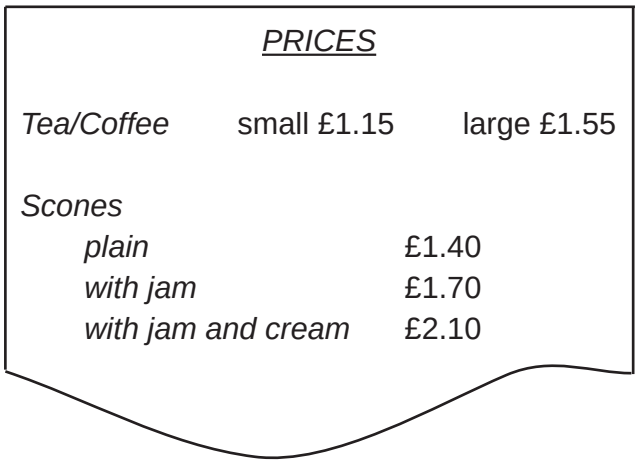
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4. *You will be assessed on the quality of your written communication in this question.*

Three friends Anwar, Matthew and Catrin visit a restaurant for afternoon tea.

Part of the menu is shown below.



PRICES

Tea/Coffee	small £1.15	large £1.55
Scones		
plain	£1.40	
with jam	£1.70	
with jam and cream	£2.10	

Anwar has a small coffee and a scone with jam.
Matthew has a small tea and a scone with jam and cream.
Catrin has a large coffee only, with nothing to eat.

They share the total bill equally between them.

Explain clearly who benefits the most from not paying their own individual bill and how much he or she saves.

.....

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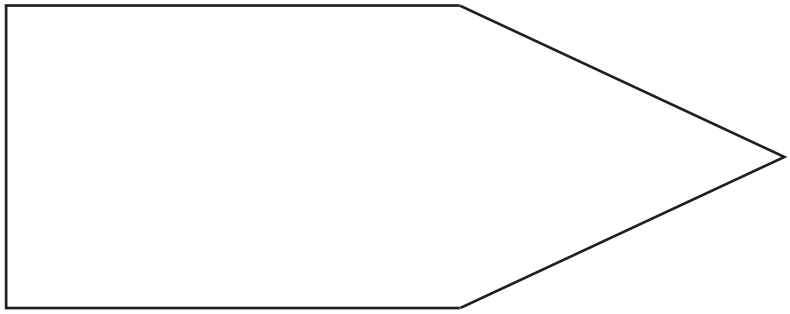
[8]

4351 010007

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5. A scale drawing of a metal plate to be used as a road sign is shown below.



Scale: 1 cm represents 10 cm.

(a) Measure, and write down the size of the angle at the point of the sign.

..... °

[1]

(b) Calculate the **actual** length of the sign.

.....

.....

.....

[2]

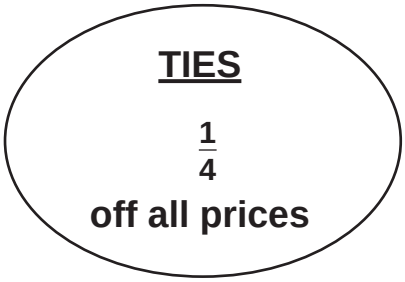
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6. *(a)* Explain clearly which of these offers gives customers the better value.



OFFER A



OFFER B

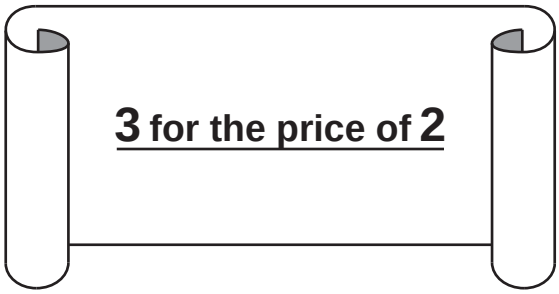
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.....

.....

[1]

(b) A store advertises the following offer on bottles of shampoo.



How much would you save in buying 12 identical bottles of shampoo priced at £2.35 each?

.....

.....

.....

.....

.....

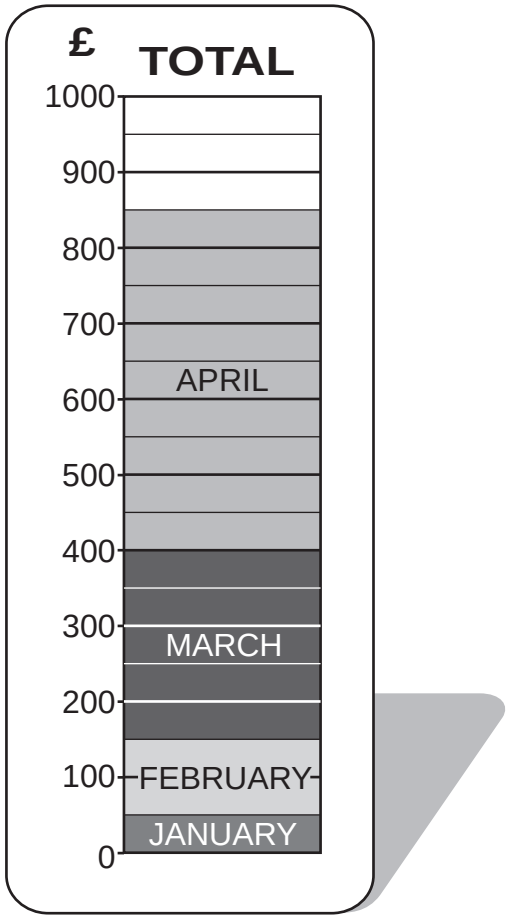
.....

[3]

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7. A charity has set itself a target of collecting £1000.
A board standing outside their charity shop shows how much was collected each month.



(a) How much more money must be collected to reach their target of £1000?

.....

[1]

(b) How much money was collected during the month of April?

.....

[1]

(c) How much more money was collected in March than in January?

.....

.....

[2]

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Examiner only

8. A rectangular floor is 24 m long and 18 m wide.

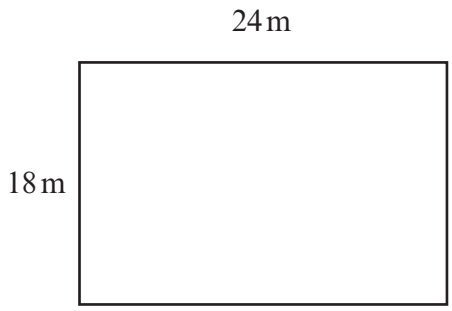


Diagram not drawn to scale

A pattern is to be created by drawing equally sized squares to cover the floor.

(a) (i) Which of the following sizes of squares can be used?

3 m by 3 m **4 m by 4 m** **6 m by 6 m.**

.....

[1]

(ii) Calculate how many squares you would be able to draw on the floor for each of the sizes that you have chosen above.

.....

.....

.....

.....

[2]

(b) Explain how you could use rectangular shapes, **6 m by 4 m**, to cover the floor if the lengths of all the rectangles have to be in the same direction.

.....

.....

.....

.....

.....

[1]

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9. *(a)* Peter exchanged £350 into kroners in order to visit Denmark.

The exchange rate was £1 = 7.9 kroners.
How many kroners did he receive?

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[2]

(b) When in Denmark he paid 400 kroners for a fishing trip.
Assuming the same exchange rate, what was the cost of the fishing trip, in £, correct to the nearest pound?

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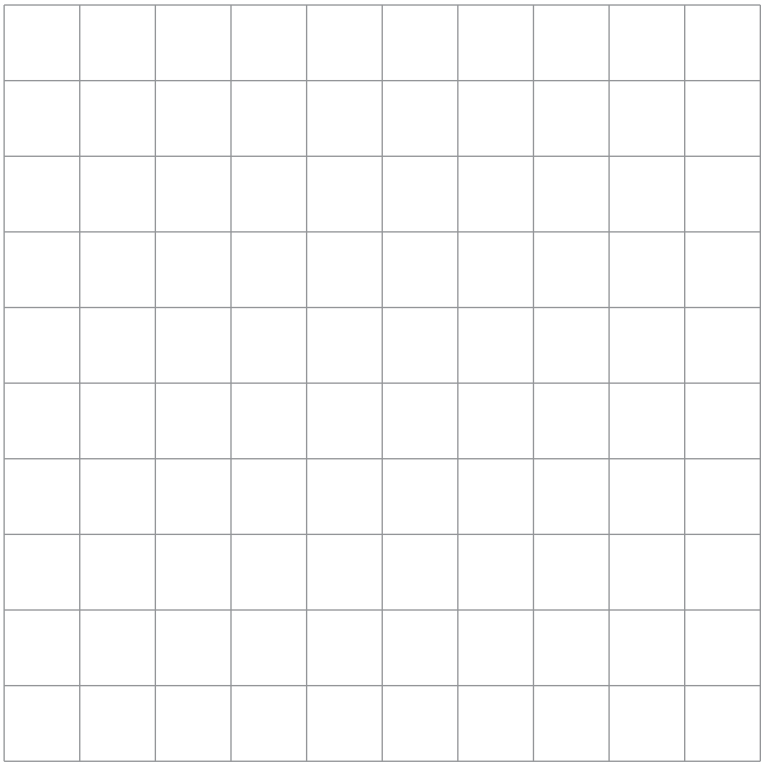
[3]

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(c) Use the grid below to construct a conversion graph between £s and kroners that will help Peter to make approximate conversions for amounts up to £10.

[3]



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10. In a competition, teams are awarded 3 points for a win, 1 point for a draw and 0 points if they lose a match.

Three teams in the competition have each played nine games and they all have 15 points.
Each of these three teams has won a **different number** of matches to the other two teams.

Complete the table below to show three possible ways of gaining 15 points after playing 9 games.

[3]

Played	Won	Drawn	Lost	Points
9				15
9				15
9				15

Working space

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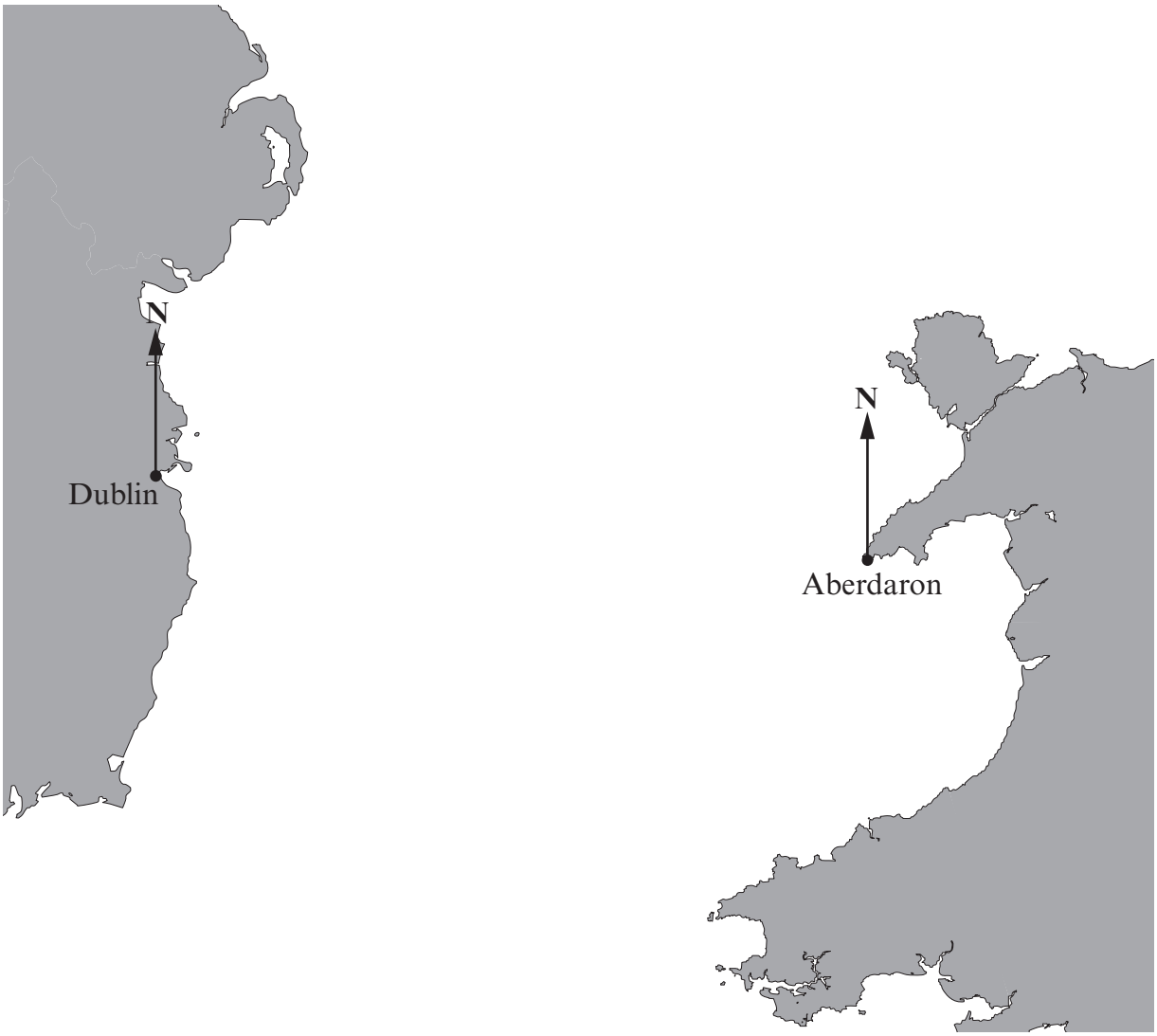
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11. A ship, *S*, is on a bearing of 075° from Dublin and on a bearing of 330° from Aberdaron. By drawing suitable lines on the diagram below, mark the position of *S*.

[3]



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12. Farah is 26 years older than her son Amir.
Their mean age is 30 years.

How old is Farah?

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[3]

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13. Gareth has 10 wooden fence panels that need painting on **both sides**.
Each fence panel is 2 m long and 1·5 m high.

The paint he wants to use is only sold in cans that contain enough paint to cover an area of 25 m^2.
Each can costs £12.99.

(a) How much will Gareth have to pay in order to have enough paint?

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[5]

(b) How many more complete fence panels could he have painted with the paint he has left over?

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[2]

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14. Sian invests £7000 for 3 years at 4% per annum compound interest.
Find the compound interest earned in the 3 years.

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[4]

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