WJEC GCSE MATHEMATICS (LINEAR)

MATHS



EXAM QUESTION PACK

PAPER 2 FOUNDATION TIER 4370 PAPERS

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4370/04

S16-4370-04

MATHEMATICS – LINEAR
PAPER 2
FOUNDATION TIER

A.M. THURSDAY, 9 June 2016

1 hour 45 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 **14**.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**7**	
2.	**4**	
3.	**7**	
4.	**5**	
5.	**3**	
6.	**5**	
7.	**4**	
8.	**2**	
9.	**4**	
10.	**8**	
11.	**6**	
12.	**9**	
13.	**3**	
14.	**7**	
15.	**4**	
16.	**5**	
17.	**8**	
18.	**5**	
19.	**4**	
Total	**100**	

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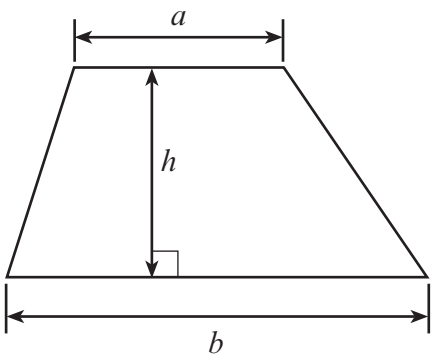
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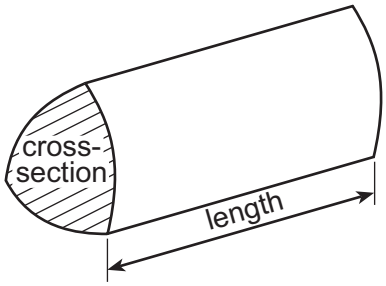
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Formula List

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



Volume of prism = area of cross-section × length



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1. *(a)* Sioned decides to build a patio.
Complete the following bill for the items she buys. [4]

Item	Cost
5 sacks of chippings at £20.50 per sack	£ 102.50
92 paving stones at £6.68 each	£
8 jumbo bags of sand at £39.99 per bag	£
12 bags of cement at £4.15 per bag	£
Total	£

(b) Sioned had saved £2000 to pay a builder for laying the paving stones.
The builder worked for 86 hours and charged £18.75 per hour.
After paying the builder, how much money did she have left over? [3]

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2. Circle the quantity that is an appropriate estimate for each of the following. [4]

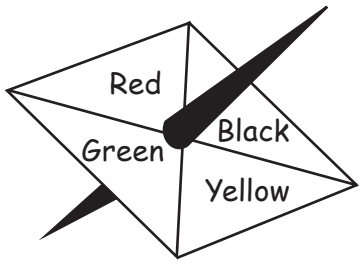
Weight of a dinner plate	650 kg	650 g	650 mg	65 g
Volume of water in a full bucket	5 litres	500 cm^3	50 ml	5 cl
Width of a door	80 km	80 m	80 mm	80 cm
Area of the floor of a bedroom	9 m^2	900 cm^2	90 mm^2	900 cm^3

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3.



A spinner can land on any of its 4 sections coloured Red (R), Black (B), Green (G) and Yellow (Y).
The spinner is spun 40 times and the results are shown below.

R	B	G	Y	R	R	Y	Y	R	Y
G	Y	Y	B	Y	G	B	Y	Y	B
Y	R	B	Y	G	B	Y	R	B	R
G	B	Y	G	B	R	B	Y	B	R

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

Colour	Tally	Frequency
R		
B		
G		
Y		

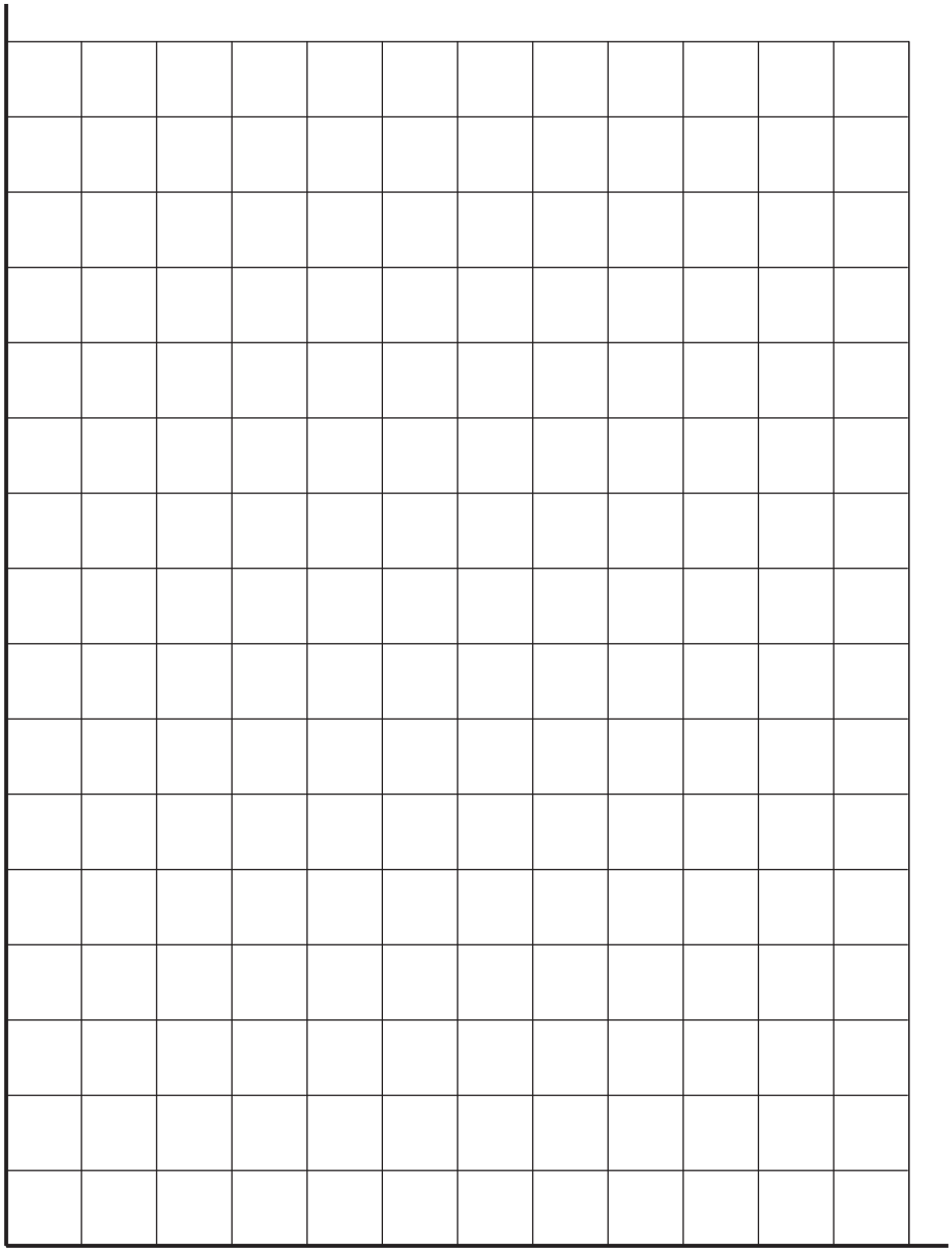
(b) Write down the mode ..... [1]

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(c) Using the graph paper below, draw a suitable bar chart of the data given in the table. [4]

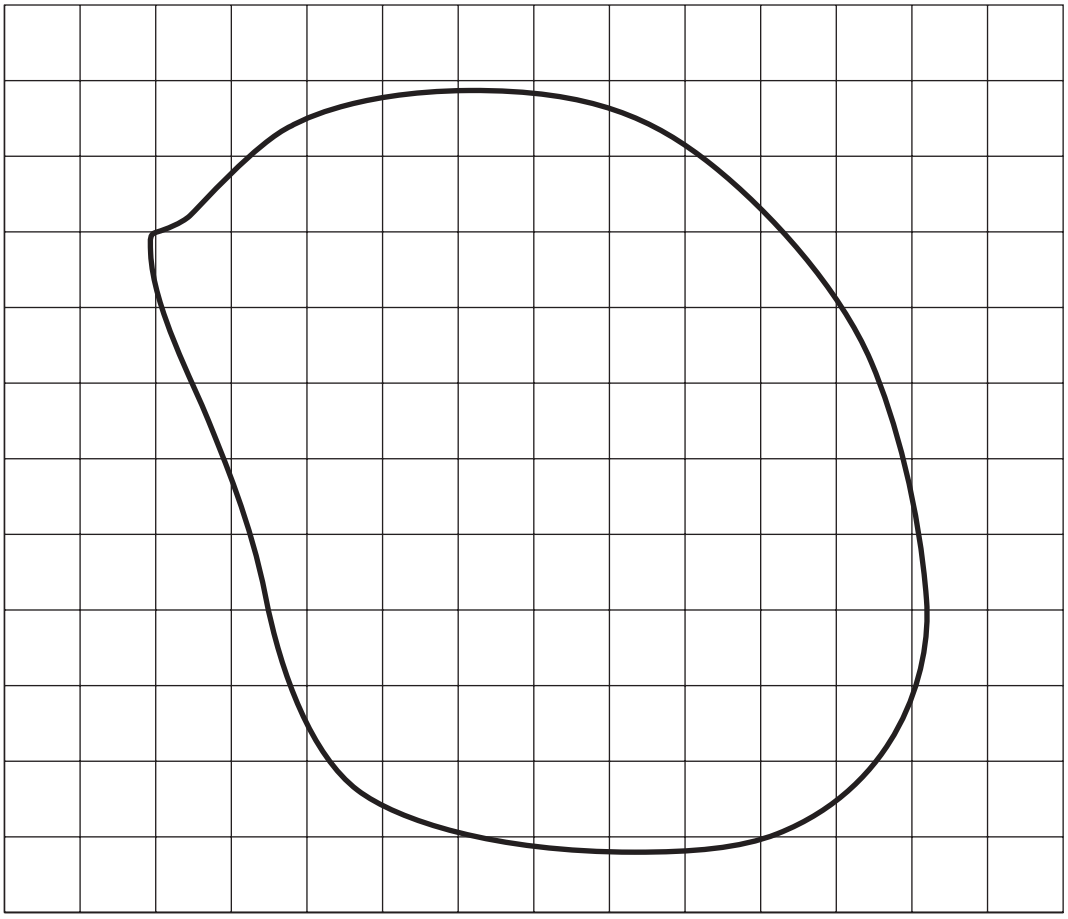


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4. *(a)*



The above shape is the outline of a pond.
It is drawn on a square grid where each square represents 5 m^2.
Estimate the area of the surface of the pond. [3]

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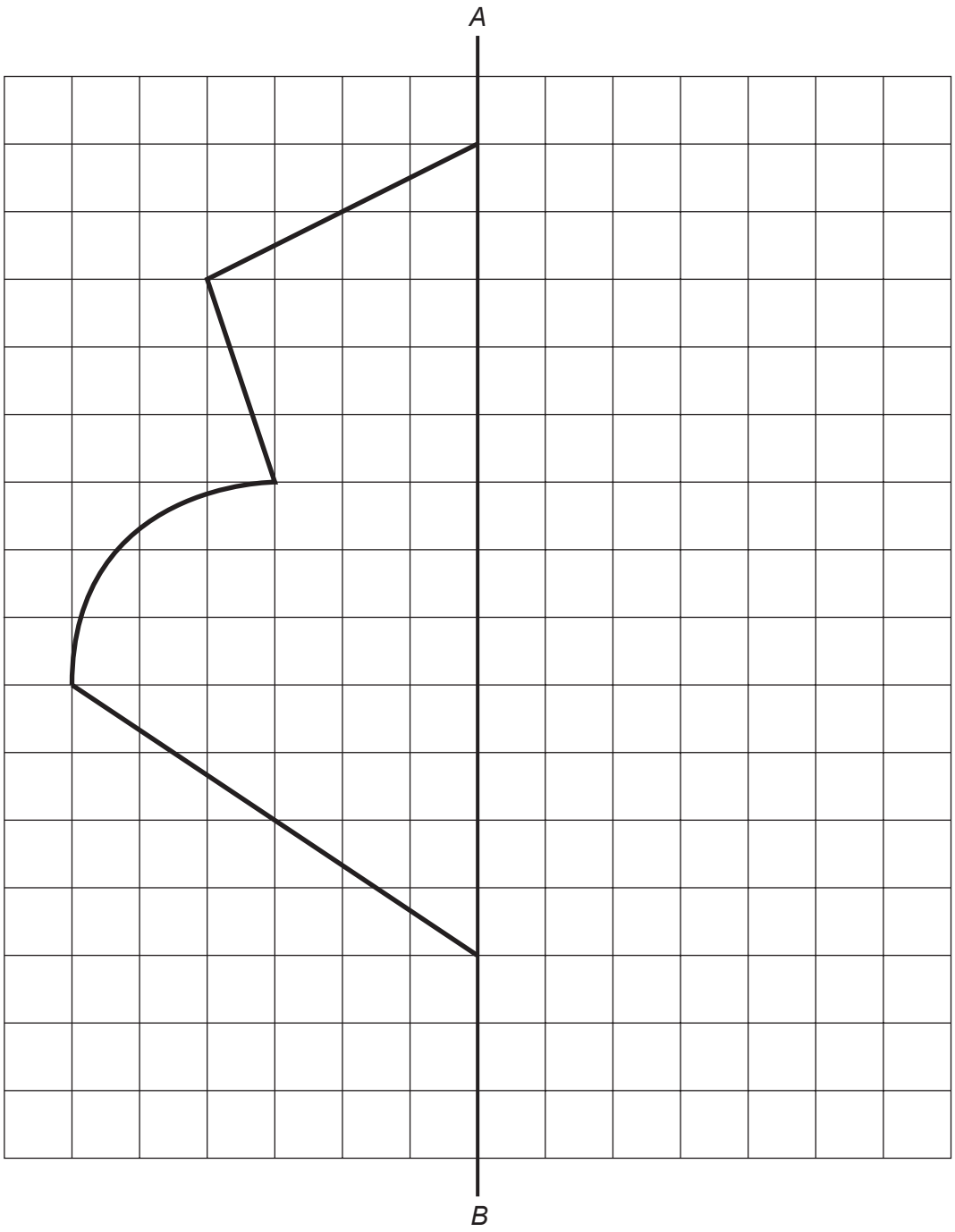
Area of the surface of the pond = ... m^2

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(b) Complete the following figure so that it is symmetrical about the line *AB*. [2]



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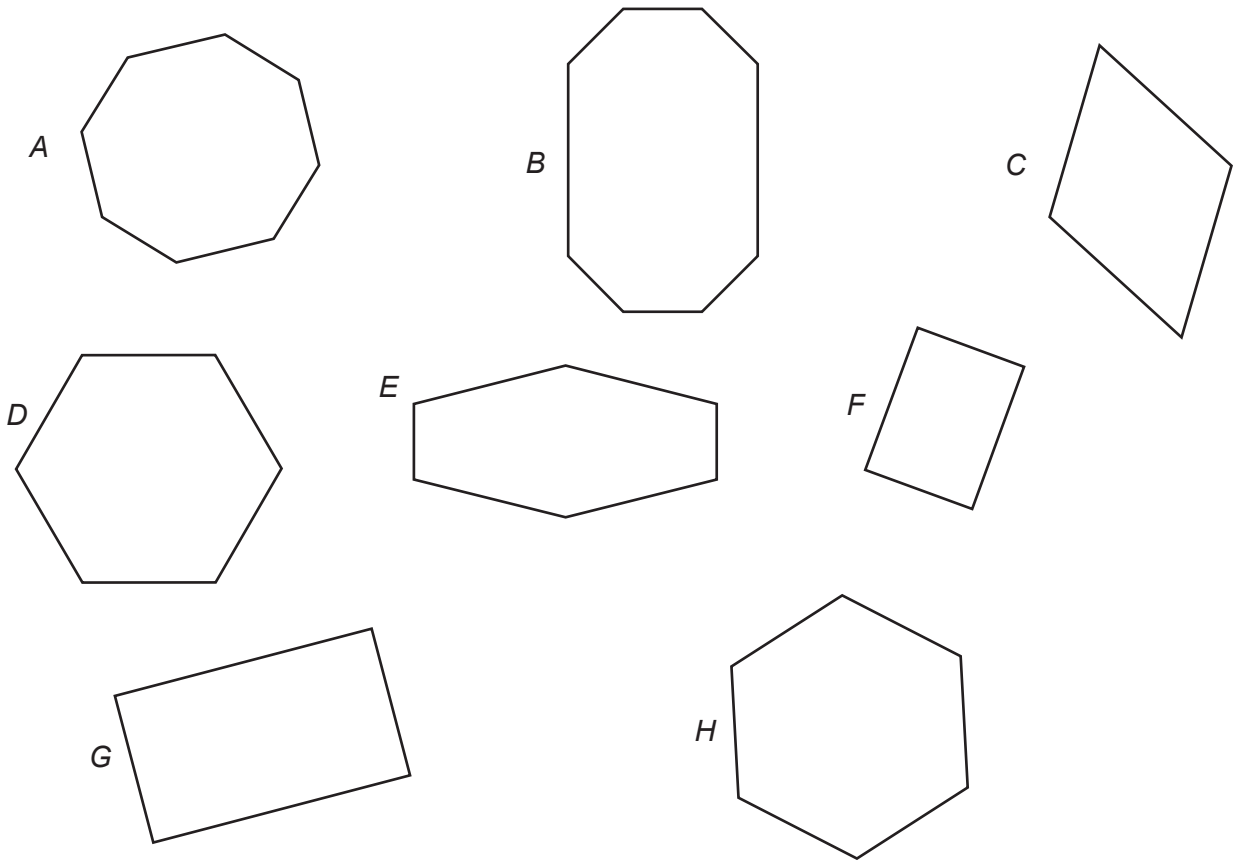
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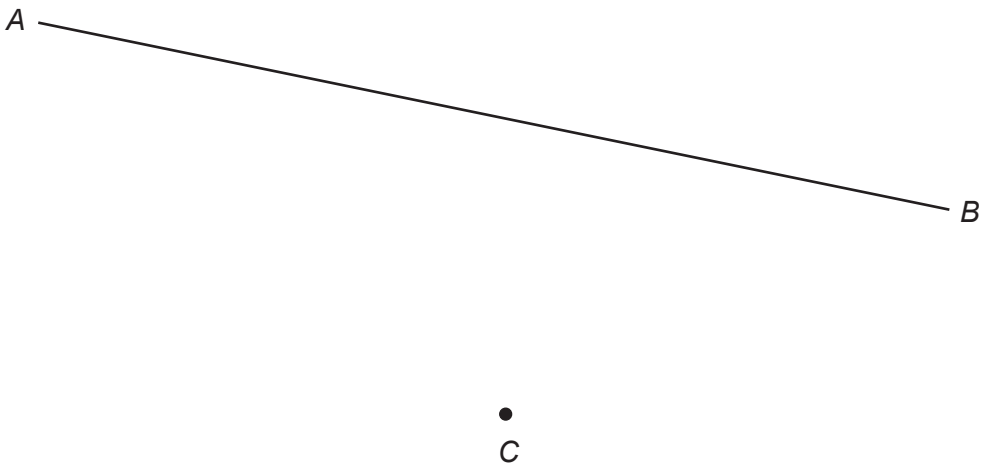
5. *(a)* Which of the following shapes are congruent? [1]

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(b) (i) Measure, in centimetres, the length of the line *AB*. [1]

Length of *AB* = ... cm



(ii) Draw a line perpendicular to *AB* that passes through *C*. [1]

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6. *(a)* Describe **in words** the rule for continuing each of the following sequences.

(i) 60 53 46 39 32 ..... [1]

Rule:

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(ii) 81 27 9 3 1 ..... [1]

Rule:

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(b) (i) A household gets m bottles of milk every day (Sunday to Saturday).
Write down, in terms of m, the total number of bottles of milk received in a week. [1]

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(ii) David has x triangles. Altogether, these triangles have y sides.
Write down a formula for x in terms of y. [2]

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7. *(a)* Mary's salary of £14 000 is increased by 3%.
How much is this increase? [2]

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(b) Calculate $\frac{4}{5}$ of 65. [2]

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8. What is the perimeter of a square that has an area of 64 cm^2? [2]

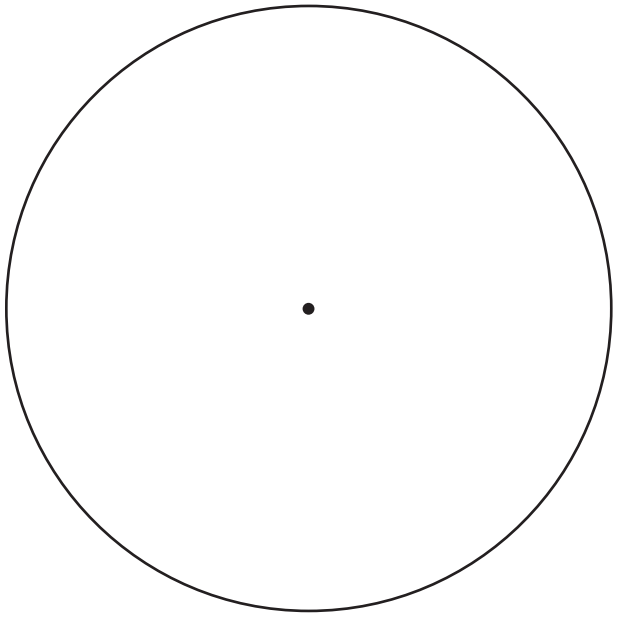
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9. Ninety pupils were asked what they drank with their breakfast.
Of these pupils, 40 drank tea, 25 drank coffee, 16 drank milk and 9 drank other drinks.
Draw a pie chart to illustrate the different drinks that the pupils had with their breakfast.
You should show how you calculate the angles of your pie chart. [4]



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10. The ages, in years, of 8 members of a fitness club were:

55 37 34 42 46 29 31 62

(a) Find the median of their ages. [2]

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(b) Find the range of their ages. [1]

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(c) Find the mean of their ages. [3]

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(d) Assuming that the membership has not changed in the last four years, what were the mean and range of their ages four years ago? [2]

mean = ... range = ...

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Turn over.

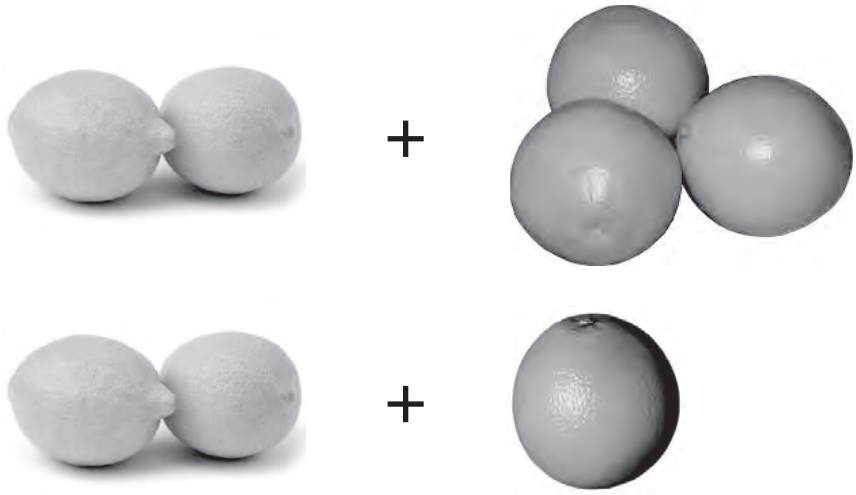
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11. *(a)* Simplify $9x + 5y - 7x + 2y$. [2]

(b) A number is divided by 4.
3 is added to the answer to get 11.
What was the number? [2]

(c) Two lemons and three oranges cost £1.40.
Two lemons and one orange cost 80p.
How much does one orange cost? [2]



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12. *(a)* Calculate 28% of £42. [2]

(b) The total cost of 6 loaves and 14 baguettes is £16.54.
One loaf costs £1.24. Find the cost of one baguette. [4]

(c) Giving full reasons, find which of the following fractions is nearest to $\frac{2}{5}$:

$\frac{6}{10}$ $\frac{9}{25}$ $\frac{21}{50}$ [3]

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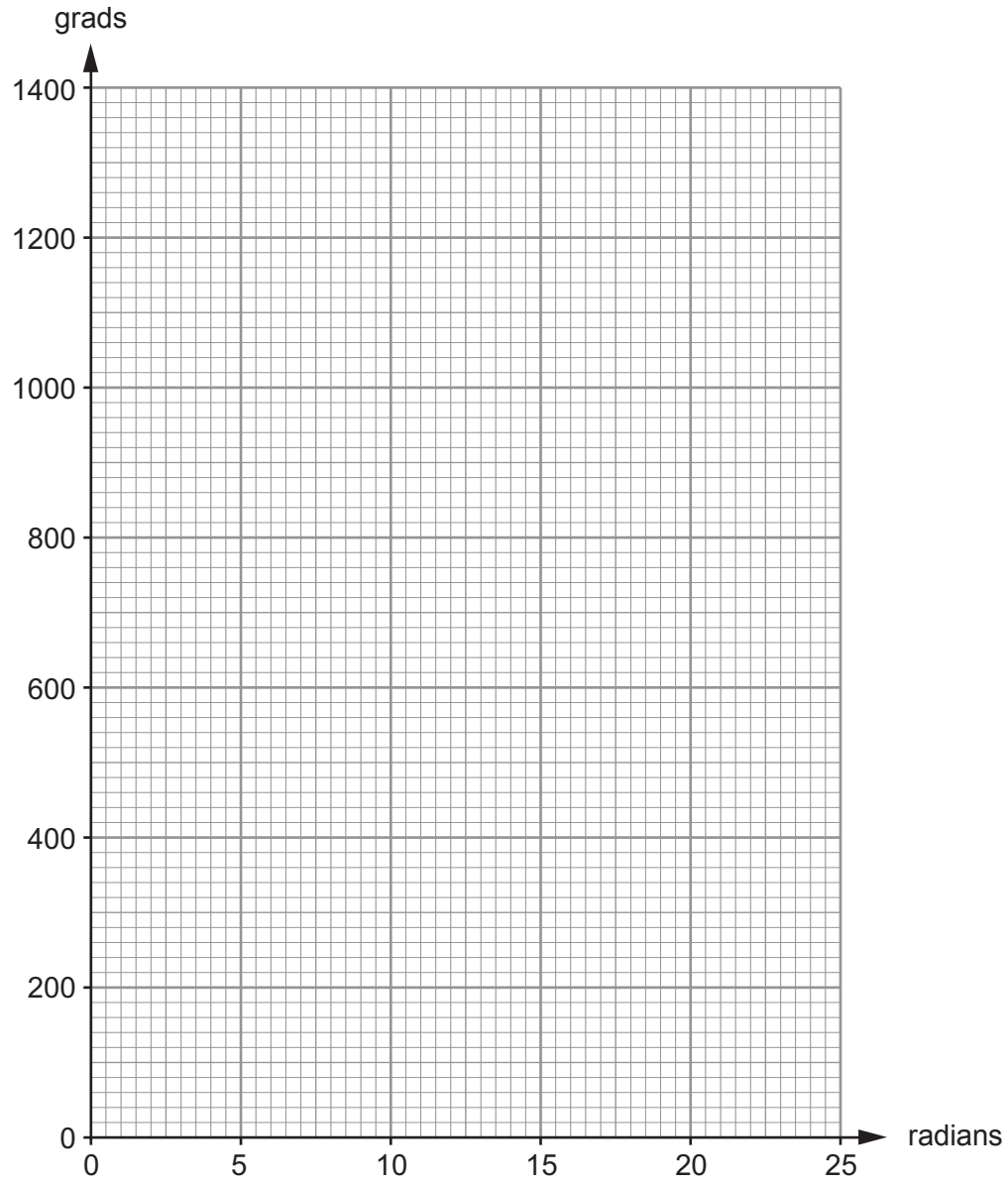
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13. *(a)* Angles can be measured in **radians** or **grads**, as well as in degrees.
The table gives 3 angles, measured in radians and in grads.

	Angle 1	Angle 2	Angle 3
Radians	4	15	21
Grads	255	955	1337

Use the data in the table to draw a conversion graph between radians and grads. [2]



(b) Use your graph to find an estimate for 700 grads in radians. [1]

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

Mr and Mrs Price received their electricity bill. The details were as follows:

Present meter reading	7982 units
Previous meter reading	6629 units
Charge per unit	19.3 pence per unit
VAT	5%

Find the total cost of the electricity, including VAT.
Give your answer in pounds (£), correct to the nearest penny.
You must show all your working. [7]

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15. In 2014, the average amount of paper used per person in China was 74 kg, and in the USA it was 228 kg.

(a) Insert a value, correct to 2 significant figures, in the following statement. [2]

'In 2014, on average, each person in the USA used ..... times as much paper as each person in China.'

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(b) Between 55% and 60% of the paper used in the USA is recycled paper.
Insert values, correct to the nearest kg, in the following statement. [2]

'In 2014, of the average 228 kg of paper used by each person in the USA, between ..... kg and ..... kg of this was recycled paper.'

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16. Some measures for mass are the same in the USA as they are in the UK.
Some measures are different.

A **pound** is the same measure in both the USA and the UK.
The measures known as **hundredweights** and **tons** are different in the USA and the UK.

1 ton = 20 hundredweight in both the USA and the UK.

USA 	UK 
1 hundredweight = 100 pounds	1 hundredweight = 112 pounds

(a) Complete the statement, [1]

43·5 tons = ... hundredweight

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(b) A truck in the USA carries a load of 28 USA tons.



A lorry in the UK carries a load of 26 UK tons.



Calculate the difference between the two loads **in pounds**.
Express this difference as a percentage of the load carried by the USA truck. [4]

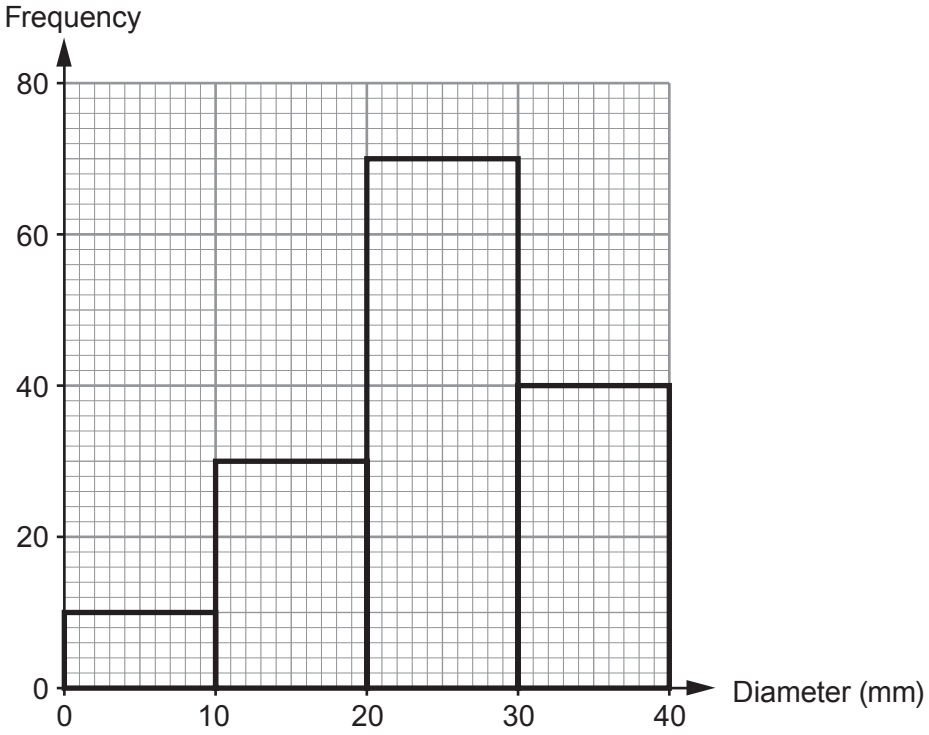
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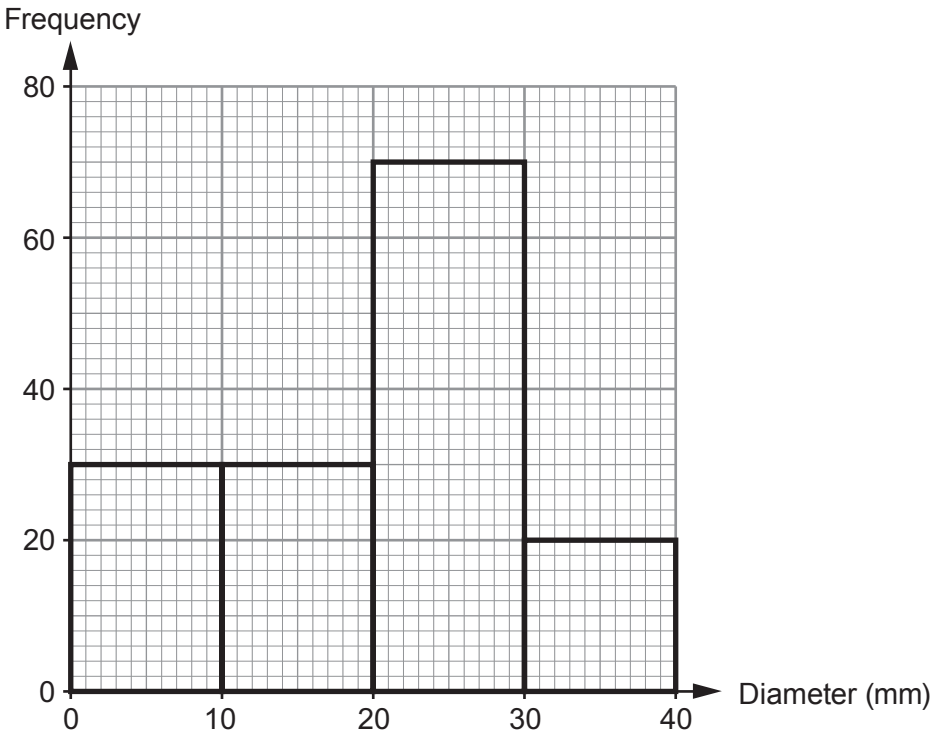
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17. One day in November, Bryn and Luke cut some branches off some trees.
The grouped frequency diagrams show the diameters of the branches they cut.

Branches cut by Bryn



Branches cut by Luke



(a) How many of the branches that Luke cut had diameters between 10 mm and 30 mm? [1]

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(b) Who cut more of the branches with the greater diameters on this day? Give a reason for your answer. [1]

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(c) Calculate an estimate for the mean diameter of all the branches that Bryn cut on this day. [5]

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(d) The median diameter of the branches cut by Bryn lies in the group 20 mm to 30 mm. Explain how this can be checked using the frequency diagrams. [1]

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18. The currency in Brazil is known as the Brazilian Real, BRL.

		
Year	Pound (£)	Brazilian Real (BRL)
2010	1	2.86
2014	1	3.71

In 2010, Ava bought £3400 worth of Brazilian Real, BRL.
In 2014, Ava exchanged this money back into pounds.

Did Ava gain or lose money?
State how much money Ava gained or lost, giving your answer correct to the nearest pound.

[5]

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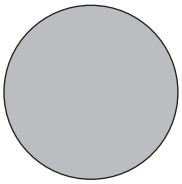
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19. Rayner plans to make a circular garden pond.



She has bought 10 metres of edging to place around the circumference of the pond.

Because of where the pond is to be placed, it must have a **diameter** that is a **multiple** of 0·9 m.
Rayner decides to make the largest pond she can with the edging she has bought.

What length of edging will she have left over?
Give your answer in metres, correct to 2 decimal places. [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

SUMMER 2016

GCSE MATHEMATICS - LINEAR PAPER 2
FOUNDATION TIER

4370/04

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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 - Linear Paper 2 Foundation Tier
Summer 2016 Mark Scheme

2016 Summer Linear Paper 2 (Calculator allowed) Foundation Tier	**Marks**	**Comments**
1. (a) (102.50) (chippings) 614.56 (paving stones) 319.92 (sand) 49.8(0) (cement) 1086.78**(0)**	 B1 B1 B1 B1	 F.T.
1. (b) 86 × (£)18.75 = (£) 1612.5(0) Leaving (£) 387.5(0)	M1 A1 B1	Any correct method for finding the 1612.5 F.T. 2000 – 'their 1612.5'. B1 for £387.5(0)p but B0 for 387.5(0)p
2. Weight of plate 650kg (650g) 650mg 65g Volume of bucket (5 litres) 500 cm^3 50 ml 5 cl Width of a door 80 km 80 m 80 mm (80 cm) Area bedroom (9 m^2) 900 cm^2 90 mm^2 900 cm^3	B1 B1 B1 B1	
All parts (a) – (c) marked at the same time 3. (a) Red 9, Black 11, Green 6, Yellow 14,	B2	May be inferred from their bar chart. B1 for any two/three correct frequencies If frequencies score 0, then give B1 for all 4 correct tallies
3. (b) Y(ellow)	B1	Accept 14 and Yellow, but B0 for 14 only. Y=14 gets B1. **F.T. their frequencies from part (a)**
3. (c) Both axes labelled, e.g. frequency along one axis and R(ed), B(lack), Y(ellow), G(reen) along other axis. Anywhere within the base (inc.) of the corres. bar. and uniform scale for the frequency axis starting at 0 and labelled 'frequency' OR 'number'. Four bars at correct heights (bars must be of equal width) **and any gaps must be equal.**	✓ B2 B2	B1 if no scale, but allow one square to represent 1 OR B1 if not labelled as 'frequency' or similar. If frequency scale starts with 1 at the top of the first square the starting at 0 will be implied for this axis. 0 may be implied by the other numbers in their scale. F.T. their frequencies throughout. B1 for any 2 or 3 correct bars on F.T. If no frequencies given in their working, penalise -1 for each incorrect frequency on their bars up to -4 (First and third B2s)
4. (a) **(Viewed with diagram)** Evidence of square counting 74 – 81 inclusive 370 – 405 inclusive (m^2)	 M1 A1 B1	 F.T. 'their 74 – 81' × 5 Unsupported answer in the range 370 – 405 get 3 marks.
4. (b) **(Viewed with diagram)** Lines Arc	 B1 B1	 For all 3 lines. F.T. the ends of their lines, must have opposite curvature.
5. (a) D and H	B1	
5. (b) (i) 12.1 (cm) to 12.5 (cm) inclusive	B1	
5. (b) (ii) Perpendicular through C	B1	**English:** Line should be from just to the left of the 't' in 'the line' to left of AB. **Welsh:** Left of 'n' in 'llinell' to the full stop. B0 if perpendicular AND parallel lines drawn

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2016 Summer Linear Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
6. (a) (i) Subtract 7 from previous term	B1	Accept –7, down 7, **take away 7** But B0 for take 7. **B0 for n − 7**
6. (a) (ii) Divide the previous term by 3	B1	Accept ÷3 OR **(×)**⅓ **B0 for n/3**
6. (b) (i) 7*m* (bottles)	B1	Accept 7×m, m×7, m7 Accept m = 7m etc
6. (b) (ii) $x = y/3$ OR $y/3 = x$ OR $y \div 3 = x$	B2	For **an** expression connecting x with y with x as the subject. B1 for $y=3x$
7. (a) 3/100 × (£)14000 = (£)420(.00) ISW	M1 A1	SC1 if only (£)14420 given.
7. (b) $\frac{4}{5} \times 65$ = 52	M1 A1	Ignore any units given e.g. £52 gets M1, A1
8. (Side) = 8 (cm) (Perimeter) = 32 (cm)	M1 A1	SC1 for $4 \times \sqrt{64}$ OR 8×8 (=64) **M0,A0** for Perimeter = $\sqrt{64}$ =8 Watch for 64÷2 = 32 which gets M0,A0
9. 3 or 4 angles correct and four 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 If 0 OR 1 for their diagram or no diagram, 360/90 Angles are 160°, 100°, 64° and 36°.	 B4 B3 B3 B2 B1 M1 A1	**Use the angle measurer tool. Allow + 2°.** Correct labels (Letter/word NOT the frequency OR angle). Accept labels in the form of a key. 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 4° gets the M1. 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. OR SC1 for all percentages: 44·4, 27·8, 17·8, 10 OR rounded OR truncated.
All parts (a) to (d) marked together 10. (a) 29 31 34 37 42 46 55 62 Median = 39.5 (years)	M1 A1	For identifying the correct TWO middle numbers OR for arranging the 8 numbers in ascending or descending order. C.A.O. Unsupported 39.5 gets M1, A1.
10. (b) 33 (years)	B1	
10. (c) Sum of the amounts (336) Sum/8 42 (years)	M1 **m1** A1	For adding numbers that would give a total in the range 270 – 400 For dividing **their sum** in the range 270 – 400 by 8. C.A.O.
10. (d) (Mean was) 38 (years) (Range was the same) 33 (years)	B1 B1	F.T. 'their mean' from part (c)' – 4. F.T. 'their range' from part (b)'
11. (a) 2x + 7y	B2	B1 for 2x OR 7y Must be 2x + 7y for B2. **Mark final answer.**
11. (b) (11 – 3) = 8 (8 × 4) = 32	B1 B1	Accept embedded (unsupported) answers like 32/4 = 8, 8 + 3 = 11
11. (c) Subtracting or difference gives 2 oranges cost 60 (p) 1 orange costs 30 (p)	M1 A1	**For a correct method that leads to oranges only on one side and money on the other.** M1, A1 for £(0).30(p) but M1, A0 for (0).30p Ignore cost of lemon Accept embedded answers like 0.80+0.30+0.30 = (£)1.40 **Unsupported 30(p) gets M1,A1.**

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2016 Summer Linear Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
12. (a) 28/100 × (£)42 = (£)11.76 ISW	M1 A1	C.A.O. Ignore subsequent work, e.g. £42 – £11.76 = £30.24. But M1, A0 for 11.76%.
12. (b) 6 loaves cost = 6 × (£)1.24 = (£)7.44 **AND** 14 baguettes cost = £16.54 – £7.44 = (£)9.1(0) One baguette costs 910/14 65p OR 65 OR £(0).65(p) **OR .65**	✓ M1 A1 m1 A1	For the complete method that leads to the total cost of the baguettes. C.A.O. Dependent on the M1. (Cannot be awarded if M0). F.T. their "£9.10", but £16.54/14 gets m0. (0).65p OR £65 get A0. If F.T. leads to fractional pence, allow A1 for any correct answer, rounded or truncated.
12. (c) 30/50, 18/50, 21/50 2/5 = 20/50 OR 60/100, 36/100, 42/100 2/5 = 40/100 **(Differences =** 10/50, 2/50, 1/50) (OR 20/100, 4/100, 2/100) Nearest is 21/50 (OR 42/100)	B1 M1 A1	Common denominator with at least 2 correct equivalents **Accept percentages and/or decimals throughout** All 4 fractions given correctly with a common denominator
13. **Both parts (a) & (b) marked together** (a) **Overlay** Plots **(within ½ small square)** Line 13. (b) 11 (radians)	 P1 L1 B1	 **P0 for Line Segments** A valid attempt at drawing a line/curve through the points Answers in the range 10.5 – 11.5 inclusive. Outside this range gets B0 unless justified by their line/curve.
14. Units used = 1353 Cost per unit × 19.3 Cost of electricity = (£)261.12(9) OR (£)261.13 (Cost inc.VAT) = 1.05 × (£) 261.12(9) OR VAT = 5/100 × (£) 261.12(9) (=(£)13.05(645)) + 261.12(9) Total = £274.18 OR £274.19 Look for (in the most part) Strand 1: For 1 mark Candidates will be expected to • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanations and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means Strand 2: For 1 mark Candidates will be expected to • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, particularly £ and p , etc.	✓ B1 M1 A1 M1 A1 QWC 2	For the correct difference of meter readings 'Their units' × 19.3 OR for 154052.6 – 127939.7 in pence or in £. ADDITION of the 2 meter readings **(281992.3)** can possibly get B0, M1, A0, then F.T. for VAT. **C.A.O.** but accept 26112.9 (p) OR 26113 (p) **DIVISION of the units by 19.3 gets M0, A0, then F.T.** F.T. 5% of 'their (£) 261.12(9)' AND add 'their 261.12' **Must be to2 d.p. and £.** 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 weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation or grammar

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2016 Summer Linear Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
15.(a) 3.1	B2	B1 for evidence of 228÷74 or 3.08(1…) or 3 or 3.10
15.(b) 125 (kg) and 137 (kg)	B2	B1 for 125.4 and 136.8, or 125 or 137
16.(a) 870 (hundredweight)	B1	
16.(b) (USA 28 tons) 28×20×100 (= 56 000 pounds) OR (UK 26 tons) 26×20×112 (= 58 240 pounds) OR (for sight of) 26×112 - 28×100 = 112 (Difference in pounds 20×112 or 58240–56000=) 2240 (Percentage difference, compared with USA) (100 ×) 2240/56000 or (100 ×) 58240/56000 - 1 (× 100) or equivalent 4(%)	✓ M1 A1 M1 A1	*Appropriate working leading to 112 must be seen, e.g. 2912 – 2800 = 112, not for sight of the '112' given in the question* CAO. Must be seen (Note: 58240 ÷ 56000 - 1 =1.04 – 1 = 0.04) FT their difference '58240-56000' correctly evaluated provided at least M1 previously awarded Allow M1 for (100 ×) 112/2800 (also FT for A1) CAO, including FT from 100 × 112/2800 = 4(%) Award M1, A0, M1, A1 for an unsupported 4% (not from 3.9 rounded to 4, the later marks are M0, A0) ***Note to markers: Watch for answers that round to 4% from incorrect working, probably from a denominator of 58240, award finally M0, A0***
17.(a) 100	B1	Do not accept 30 + 70 as a final answer
17.(b) Bryn, with a reason, e.g. 'Bryn has cut more (branches with diameters) between 30mm and 40mm', 'Bryn because he cut 40 of the thicker branches', 'Bryn because Luke only cut 20 of the thicker branches', 'Bryn because he cut 40 between 30mm and 40mm', 'Bryn because he cut 40, Luke only cut 20 (of the branches with diameter 30mm to 40mm)'	E1	Allow 'Bryn because more at 40(mm)', or 'Bryn because more at 30(mm), 'Bryn because more at 35(mm)', Bryn with a taller bar at the end of the graph'
17.(c) Sight of mid points 5, 15, 25, 35 (Total number of branches is) 150 10×5 + 30×15 + 70×25 + 40×35 (=50+450+1750+1400 =3650) ÷150 24(.333…. mm)	✓ B1 B1 M1 m1 A1	Stated or implied. Accept embedded within incorrect working e.g. 150/4, or sight of 37.5 FT provided their mid points are within or at the bounds of the intervals *(all upper bounds used gives 4400÷150, all lower bounds used gives 2900÷150)* Intention to divide their Σfx by 'their 150' provided 'their 150' ≠4 ('their 150' from attempt 10+30+70+40, i.e. similar order) CAO *Luke selected, MR-1 then:* *Mid points 5, 15, 25, 35* *B1* *Total number of branches 150* *B1* *5×30 + 15×30 + 25×70 + 35×20* *M1* *÷ 150* *m1* *20(.33… mm)* *A1* *With appropriate FT*
17. (d) Explanation that there is a need to find which group contains the 75(.5)th branch, they must mention or imply looking at the 75(.5)th branch OR Explanation such as 'less than half of the branches had diameters less than 20mm and less than half had diameters greater than 30mm, (so the median is between 20mm and 30mm)', 'there is equal area either side of 25mm'	E1	FT half 'their 150' (+0.5) provided this lies in the group 20mm to 30mm Allow '75(.5th) branch (is in the group 20mm to 30mm)', '75(.5th) value', '75(.5th) reading', '75 is halfway' Do not allow '75' without text Do not accept 'more branches are cut between 20mm and 30mm', or definition of the median without reference to the frequency diagram, or an answer of 25mm without relevant explanation or reason

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2016 Summer Linear Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
	✓	
18. (2010: £3400 to BRL) 2.86 × 3400 9724 (BRL)	M1 A1	May be implied in later working
(2014: 9724 BRL to) 9724 ÷ 3.71 (£)2621(.024..)	M1 A1	FT 'their derived 9724', provided ≠ 3400
(Ava makes a loss) Loss AND (£)779	A1	FT 3400 - 'their 2621(.024)' rounded to the nearest pound provided both M marks awarded A0 for sight of (£)778.98 or (£)778(.9…), or for (£)779 without indication of loss.
		Alternative: *(2010: £3400 to BRL) 2.86 × 3400* *M1* *9724 (BRL)* *A1* *(May be implied in later working)* *(2014: £3400 to BRL 3.71 × 3400 = 12614 BRL)* *(**AND** Difference in BRL 12614 – 9724 =) **2890 (BRL)** A1* *(FT 12614 - 'their derived 9724')* *(Difference in £ is) 2890 ÷ 3.71 (= 778.975…)* *M1* *(FT 'their 2890')* *(£)779 AND Loss* *A1* *OR* *(Difference in exchange rates) 3.71 – 2.86 (= 0.85) M1* *(Difference in BRL) 0.85 × 3400* *M1* *(FT 'their 3.71 – 2.86')* *2890 (BRL)* *A1 CAO* *(Difference in £ is) 2890 ÷ 3.71 (= 778.975…)* *M1* *(FT 'their 2890')* *(£)779 AND Loss* *A1* *If no marks award SC1 for interpretation GAIN **and** 1010 (from 3400 ÷ 2.86 × 3.71)*
19. π × d = 10 or 2 × π × r = 10 or sight of (maximum diameter) 3.18(…m)	B1	OR a correctly evaluated trial for 1 of these values of d giving C **approximately** as given below: d: 0.9 | 1.8 | 2.7 | 3.6 | 4.5 C: 2.83 | 5.65 | 8.48 | 11.31 | 14.14
Diameter (of the pond is 3×0.9 =) 2.7 (Left over edging) 10 - π × 2.7 Answer 1.51 or 1.52 (metres)	B1 M1 A1	CAO. Must be 2 d.p., an answer not rounded to 2 d.p. implies previous marks, but is A0

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4370/04

S15-4370-04

MATHEMATICS – LINEAR
PAPER 2
FOUNDATION TIER

A.M. THURSDAY, 4 June 2015

1 hour 45 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 **10**.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**6**	
2.	**4**	
3.	**6**	
4.	**5**	
5.	**4**	
6.	**9**	
7.	**4**	
8.	**4**	
9.	**3**	
10.	**6**	
11.	**8**	
12.	**4**	
13.	**8**	
14.	**8**	
15.	**8**	
16.	**7**	
17.	**6**	
Total	**100**	

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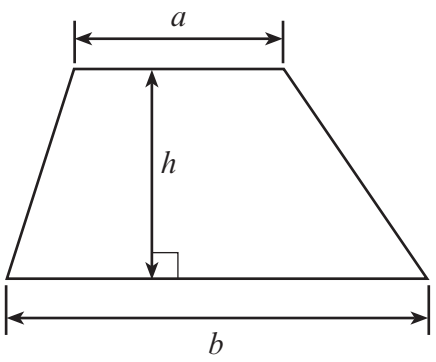
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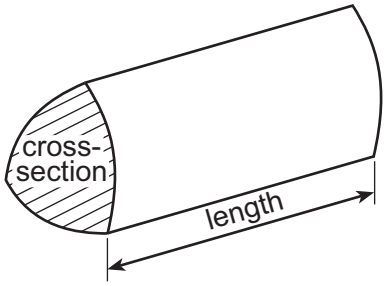
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Formula List

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



Volume of prism = area of cross-section × length



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1. *(a)* Chris goes shopping. Complete his bill. [4]

Item	Cost
4 litres of milk @ £0.89 per litre	£ 3.56
6 cartons of apple juice @ £2.47 per carton	£
5 packets of biscuits @ £1.67 per packet	£
3 boxes of tea @ £4.49 per box	£
Total	£

(b) Chris is given a 5% discount.
How much is this discount? [2]

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2. Circle the quantity that is an appropriate estimate for each of the following. [4]

Width of a football pitch	50 km	50 m	50 mm	50 cm
Weight of a man	70 kg	70 g	70 mg	7 kg
Volume of tea in a cup	1 litre	25 cm^3	250 ml	1 ml
Area of a page in a book	3 m^2	300 cm^2	30 mm^2	300 cm^3

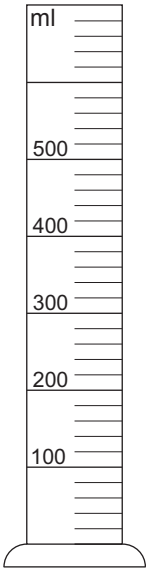
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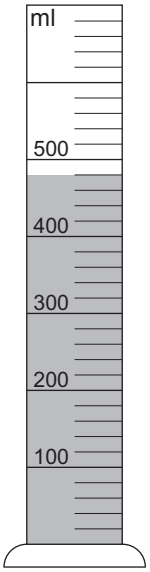
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3. *(a)* The diagram shows an empty measuring cylinder with markings in millilitres.
Three hundred and twenty millilitres of water are poured into the cylinder.
Draw a line on the cylinder to show the water level. [1]



(b) A very small jug is filled with water.
The water is then poured into an **empty** measuring cylinder.
This process is carried out a total of six times.
The final water level is shown in the diagram.
How much water does the jug hold? [3]



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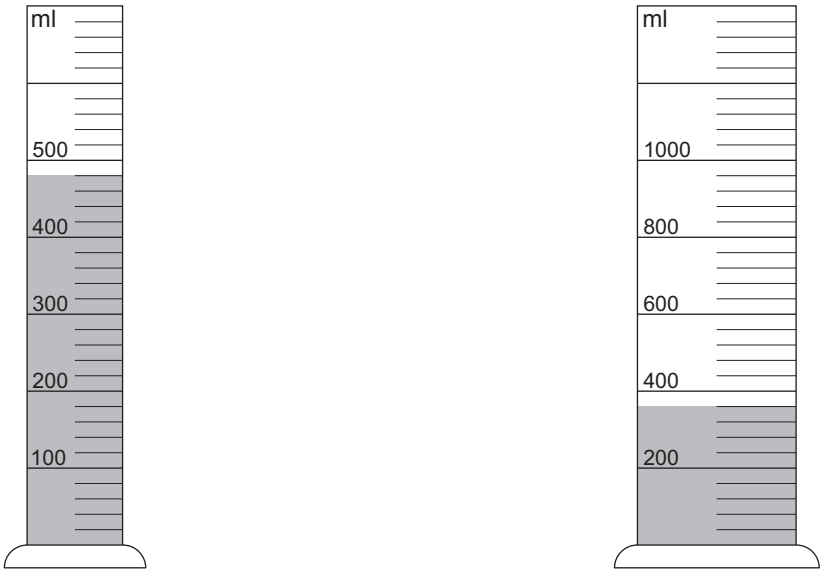
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(c) The water in the cylinder on the left is to be poured into the cylinder on the right, which already has some water in it.
Draw a line on the right-hand cylinder to show the new water level. [2]



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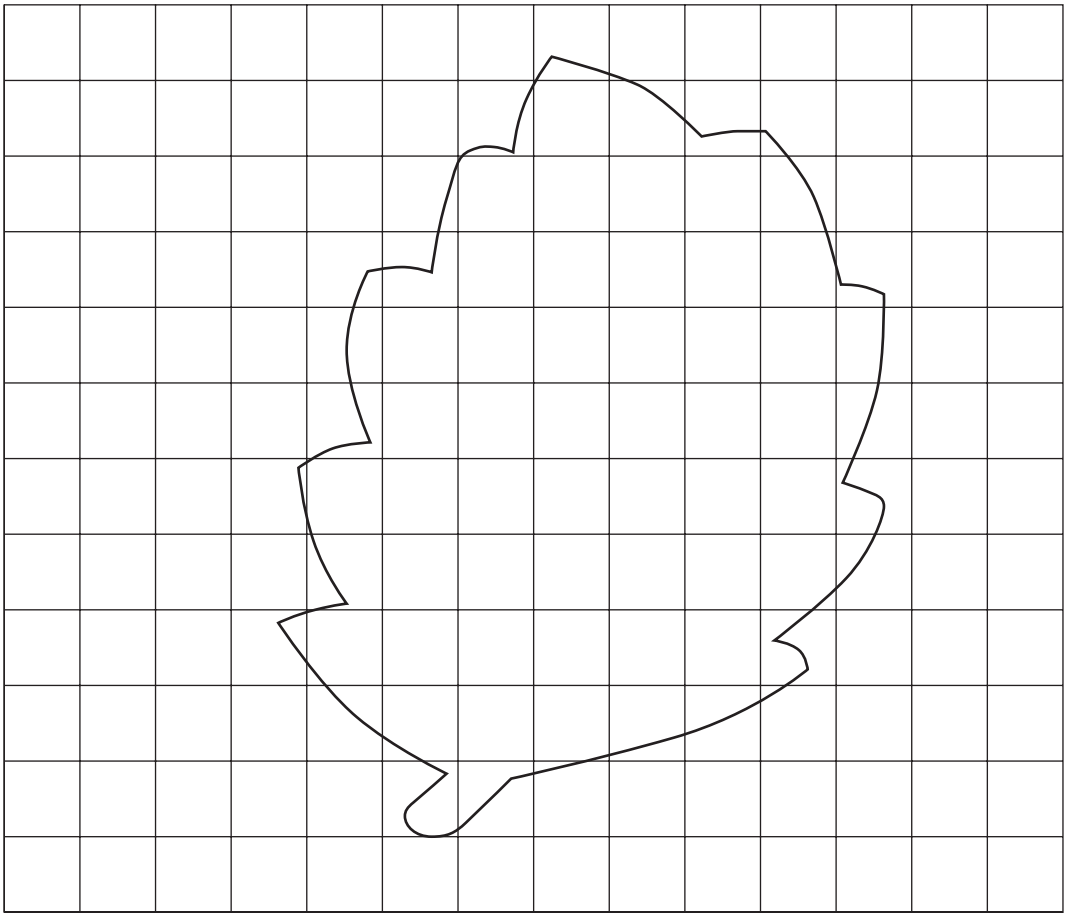
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4. *(a)*



The above shape is the outline of a leaf.
It is drawn on a square grid where each square represents 4 cm^2.
Estimate the area of the surface of the leaf. [3]

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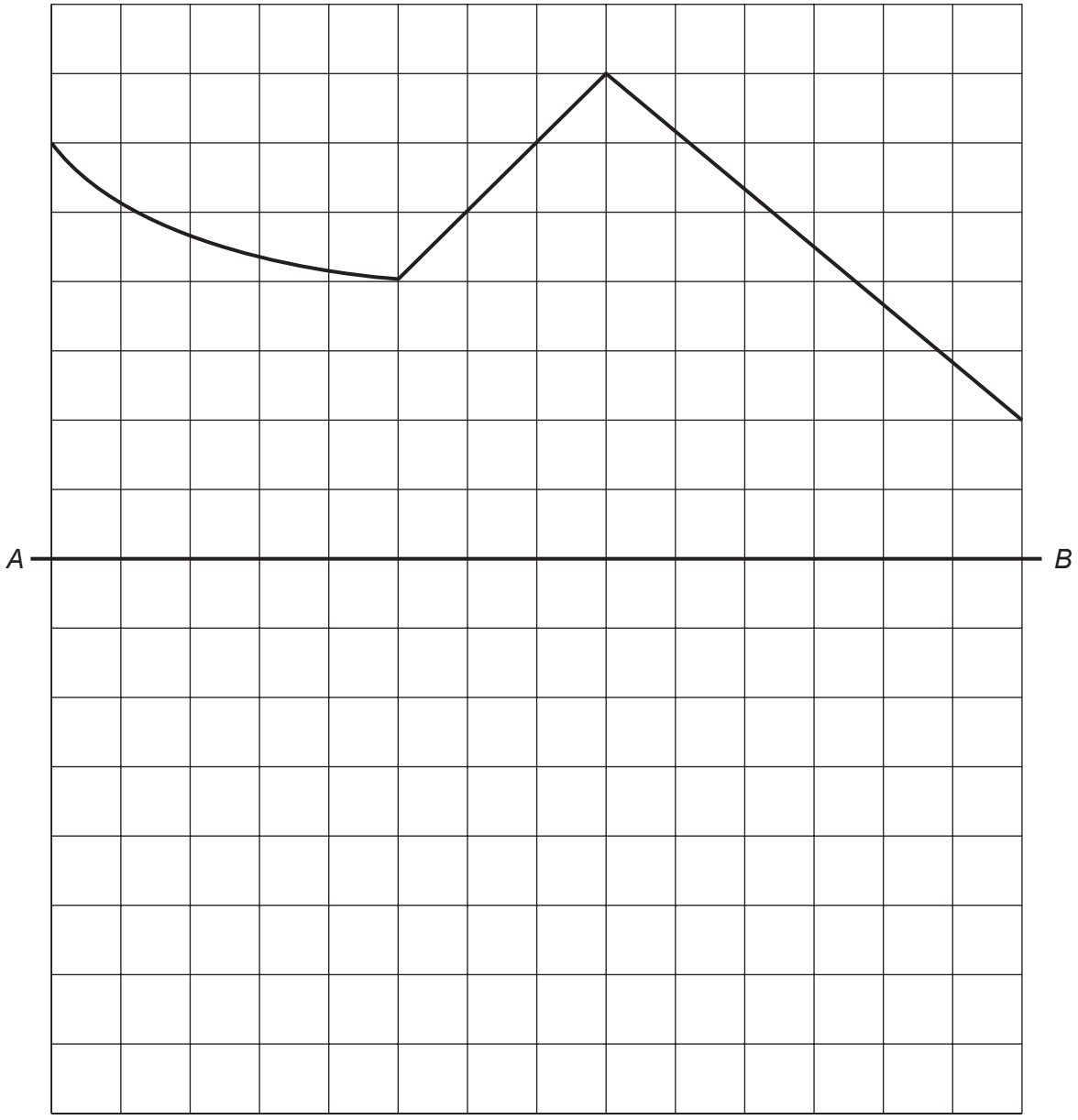
Area of the surface of the leaf = ... cm^2

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(b) Complete the following figure so that it is symmetrical about the line *AB*. [2]

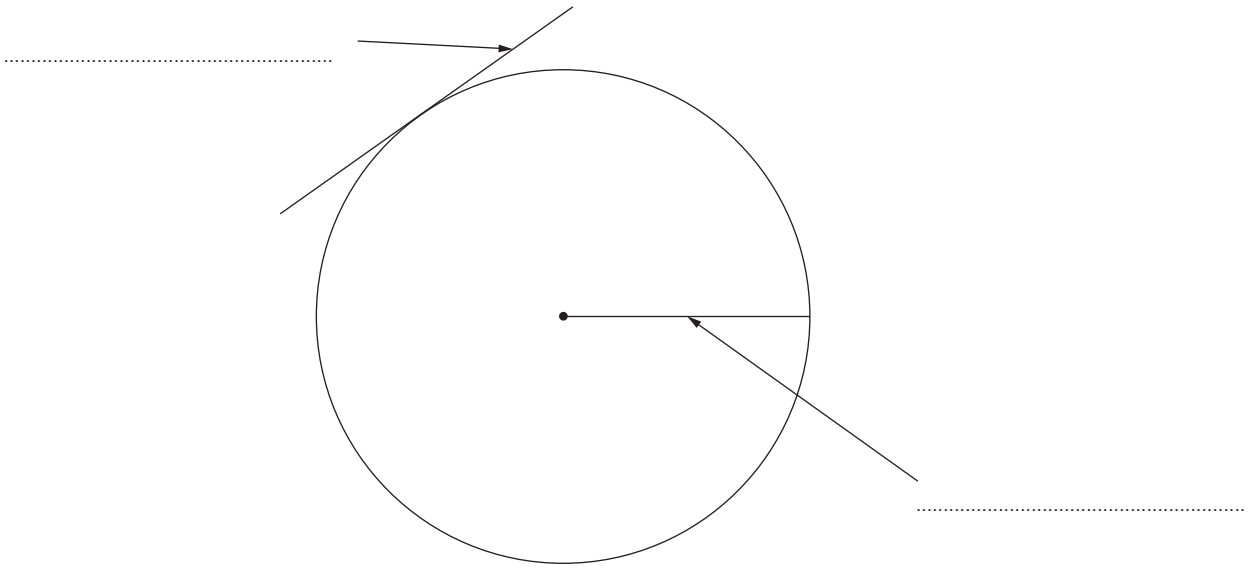


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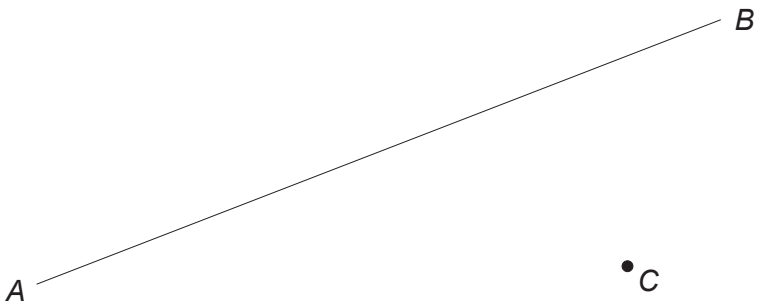
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5. *(a)* Write down the special names of the straight lines shown in the following diagram. [2]



(b) (i) Measure, in centimetres, the length of the line *AB*. [1]

Length of *AB* = ... cm



(ii) Draw a line parallel to *AB* that passes through *C*. [1]

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6. *(a)* Draw a circle around all of the following quantities that are equal to $\frac{2}{5}$. [2]

$\frac{10}{15}$ 0·4 $\frac{6}{15}$ $\frac{8}{10}$ $\frac{4}{10}$

(b) One thousand apples are put into crates.
Each crate can hold 72 apples.
How many crates can be filled and how many apples will be left over? [2]

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(c) What is 7% written as a decimal? [1]

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(d) Calculate 48% of 82·5. [2]

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(e) Calculate $\frac{3}{7}$ of 84. [2]

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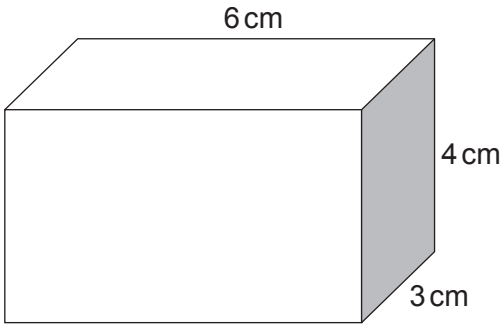
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7. The diagram shows a cuboid with measurements as shown.



Draw an **accurate** net for the cuboid.
A 6 cm by 3 cm face has been drawn for you. [4]



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8. *(a)* Describe **in words** the rule for continuing each of the following sequences.

(i) 46 41 36 31 26 ..... [1]

Rule: .....

.....

(ii) 1 −4 16 −64 256 ..... [1]

Rule: .....

.....

(b) (i) A shirt has b buttons.
Write down, in terms of b, the number of buttons on 10 shirts. [1]

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(ii) A total of k blocks are arranged in rows of 5 blocks.
There are no blocks left over.
Write down, in terms of k, the number of rows. [1]

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9. *(a)* Before 2010, the lowest temperature ever recorded on Earth was –89·2°C.
In August 2010, a new record low temperature of –93·2°C was recorded.
What is the difference between these temperatures? [1]

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(b) On July 2 1936, a temperature of 46°C was recorded in Minnesota, USA.
On February 2 1996, a temperature of –51°C was recorded in Minnesota.
What is the difference between these temperatures? [1]

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.....

(c) What temperature is mid-way between –12°C and 16°C? [1]

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

The table below gives the charges for hiring a concrete mixer by the day.

Charge for the first day	Charge per day after the first day
£16.10	£8.15

There are special offers for hiring the concrete mixer for a weekend or from Monday to Friday.

Weekend (Saturday & Sunday)	Week (Monday to Friday)
£22.54	£32.20

James wants to hire a concrete mixer from Monday to Thursday.
How much cheaper is it to hire a concrete mixer for a week (Monday to Friday) than it is to hire it from Monday to Thursday by the day? [6]

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11. The ages of 8 members of a chess club were:

28 15 60 39 47 31 24 32

(a) Find the median of their ages. [2]

(b) Find the range of their ages. [1]

(c) Find the mean of their ages. [3]

(d) A new member, aged 31, joins the club.
What will happen to the mean age?
Tick (✓) the appropriate box. [2]

The mean will increase	
The mean will stay the same	
The mean will decrease	

Explain your choice.

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12. Theo went on holiday to Brunei.

(a) He changed £950 into Brunei dollars (BND) when the exchange rate was £1 = 2.12 BND.
How many Brunei dollars (BND) did he receive? [2]

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(b) Whilst on holiday, he went on a trip which cost 180 BND.
What was the cost of the trip, in pounds? [2]

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13.

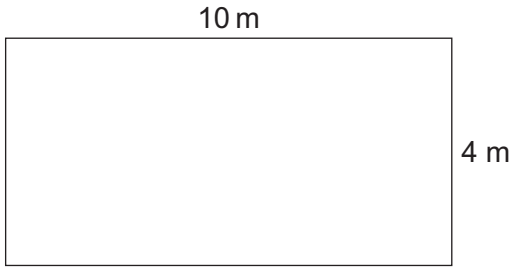


Diagram not drawn to scale

Denise's room is rectangular, measuring 10 metres by 4 metres.
She wants to cover the floor with either carpet tiles or wood strips.
Carpet tiles are square-shaped, measuring 50 cm by 50 cm. They come in packs of 32 and cost £40 per pack.
Wood strips are rectangular, measuring 2 m by 25 cm. They come in packs of 8 and cost £22 per pack.
Which type of flooring would be the cheaper?
You must show all your working. [8]

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14. *(a)* Solve the following equation. [3]

$$2(30 - x) = 44$$

(b) Simplify $3(4a - 2c) - 2(2a + 4c)$. [2]

(c) Find all integer values of n that satisfy the inequality. [3]

$$5 \leqslant 3n < 18$$

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15. The table below shows some comparative data for 3 different European airlines.



	European Airlines		
	FreeFlight	Best2Fly	GoJet
Percentage of flights arriving on time, based on 30 000 flights	85%	88%	92%
Number of complaints, per 1000 passengers	0·62	0·68	0·78
Number of lost suitcases, per 1000 passengers	0·36	0·24	0·42

Use the information given in the table to answer the following questions.

(a) FreeFlight, Best2Fly and GoJet all claim to be the best of these 3 airlines. Complete the following statements. [2]

'FreeFlight are the best of these 3 airlines because .....

.....'

'Best2Fly are the best of these 3 airlines because .....

.....'

'GoJet are the best of these 3 airlines because .....

.....'

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(b) How many of the 30 000 flights with Best2Fly were late? [2]

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(c) FreeFlight and GoJet both expect to carry 500 000 passengers next month.
How many more suitcases would you expect GoJet to lose than FreeFlight next month? [3]

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(d) Write down an estimate for the probability that a flight with GoJet does not arrive on time.
Express your answer as a percentage. [1]

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16. The diagram below shows a rectangle and a triangle joined by a common side *BD*.

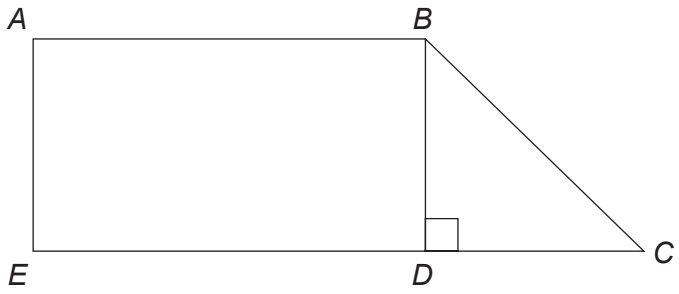


Diagram not drawn to scale

The area of rectangle *ABDE* is 3900 cm^2, *ED* = 75 cm and *DC* = 25 cm.

Calculate each of the following:

- the area of triangle *BDC*, and
- the length of *BC*.

You must show all your working. [7]

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Area of triangle *BDC* is .....

Length of *BC* is .....

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17. A machine is used to pack boxes of peaches.



There should be exactly 8 peaches in each box.

To check the machine, 10 boxes of peaches are selected on the hour for 5 consecutive hours. Each hour the number of boxes containing exactly 8 peaches is recorded.

	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.
Number of the 10 boxes with **exactly** 8 peaches	8	10	7	7	9

(a) The company prints a label for each box.

Contains at least 8 peaches

Explain why this label **may** not be suitable to use on the boxes of peaches. [1]

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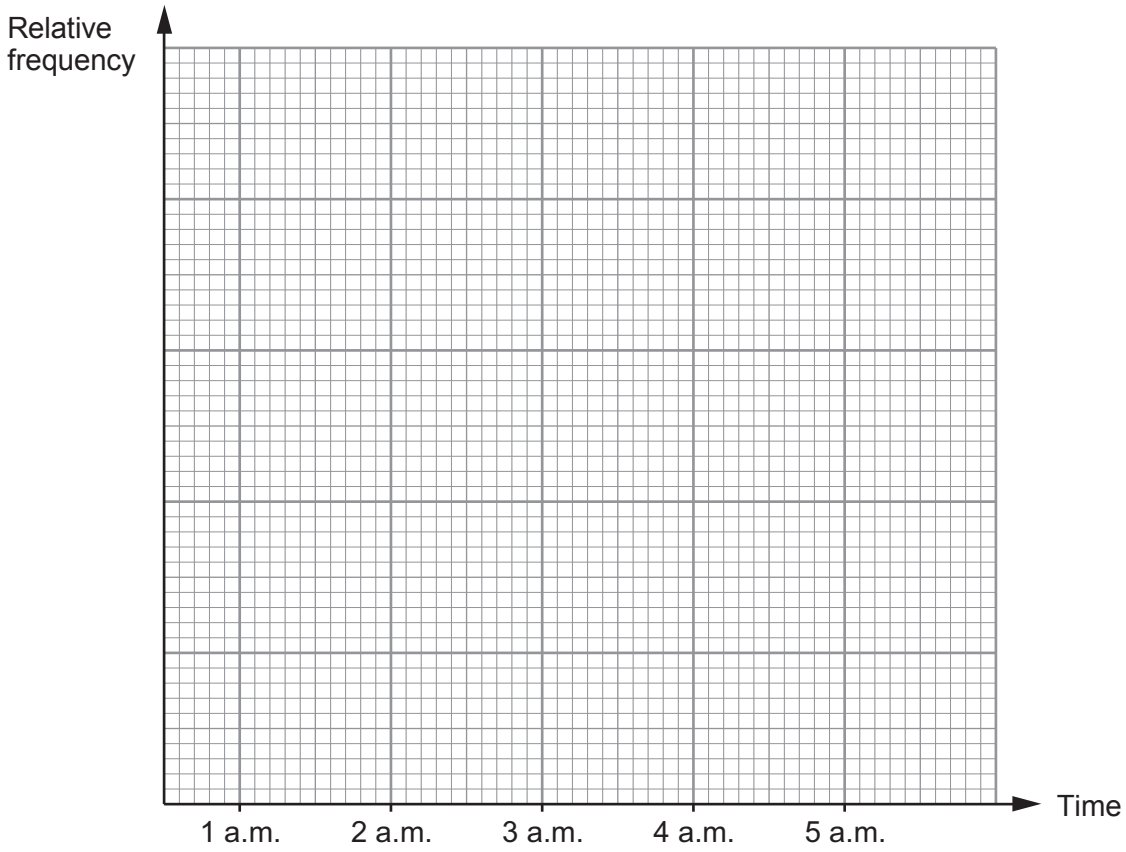
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(b) It is decided to record and plot the relative frequencies for the information shown in the previous table.

(i) Complete the table below.
Relative frequency must be recorded to 2 decimal places. [2]

	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.
Total number of boxes with exactly 8 peaches	8	18	25	32	41
Total number of boxes checked	10	20	30		
Relative frequency	0·80				

(ii) Use the graph paper below to plot the relative frequencies. [2]



(iii) A box of peaches is selected at random.
What is the best estimate of the probability that the box contains exactly 8 peaches? [1]

.....

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 - LINEAR

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 - LINEAR. 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
Paper 1 - Foundation Tier	1
Paper 1 - Higher Tier	6
Paper 2 - Foundation Tier	12
Paper 2 - Higher Tier	16

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PAPER 2 - FOUNDATION TIER

2015 Summer Linear Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
1. **Parts (a) & (b) marked at the same time** (a) (3.56) (milk) 14.82 (apple juice) 8.35 (biscuits) 13.47 (tea) 40.2(0)	✓ B1 B1 B1 B1	F.T. until second error Award B1 for a correct total (F.T.)even if only seen in (b)
(b) 10% = (£) 4.02 5% = (£) 2.01 OR (0).05 × 40.2(0) Discount is (£) 2.01 (I.S.W.)	M1 A1	Any correct method for finding 5%. F.T. their total. Ignore extra decimal places in their answer. Allow 2.01% for A1, but **2.01p gets M1,A0**. If (£)38.19 given then award M1, A1 for implied (£) 2.01. 10%=(£)4, 5% = (£)2 gets M0,A0 not of equivalent diff.
2. Width of pitch 50km (50m) 50mm 50cm Weight (man) (70kg) 70g 70mg 7kg Volume (cup) 1 litre 25 cm^3 (250 ml) 1 ml Area of page $3m^2$ ($300cm^2$) $30mm^2$ $300cm^3$	✓ B1 B1 B1 B1	
3. **All parts (a) to (c) marked together** (a) Water mark at 320 ml	B1	Look at the diagram also in (a) to (c) Water level shown at ONE GRADUATION ABOVE 300 Closer to 320 than 300 OR 340
3. (b) Water level = 480 Water in a jug = 480/6 = 80 (ml) I.S.W.	B1 M1 A1	FT 'their 480'
3. (c) 480 + 360 = 840 Water marked at 840	B1 B1	For 'their 480 from part (b)' + 360 Water level shown at ONE GRADUATION ABOVE 800. F.T. 'their 840', if not a multiple of 200. Closer to 840 than 800 OR 880
4. (a) **(Viewed with diagram)** Evidence of square counting **49 – 54 inclusive** **196 – 216 inclusive (cm^2)**	M1 A1 B1	F.T. 'their 49 – 54' × 4 **Unsupported answer in the range 196–216 gets 3 marks**.
4. (b) Lines Arc	B1 B1	For both lines. F.T. their lines, must have opposite curvature, start at the correct place and end at the start of their line.
5. (a) tangent radius	B1 B1	Accept misspellings as long as recognisable Accept misspellings as long as recognisable
5. (b) (i) 9.5 (cm) to 9.9 (cm) inclusive	B1	
5. (b) (ii) Parallel through C	B1	Watch out for perpendicular(r(s) as well as a parallel line which could be their way of 'constructing the parallel line'
6. (a) $\frac{10}{15}$ (0.4) ($\frac{6}{15}$) $\frac{8}{10}$ ($\frac{4}{10}$)	B2	B1 for any 2 correct and up to 1 incorrect OR B1 for all 3 correct and 1 incorrect.
6. (b) 13 (crates) 13 (crates) with 64 **(apples left over.)**	M1 A1	For 13 or 13.8(88…) OR 1000/72 OR 936 OR repeated subtraction 13 or 14 times. **13×72=936, 64 gets M1,A1** M1,A0 for 14 crates and 64 apples. **14 (crates) OR 64 (apples) on its own get M0,A0**
6. (c) (0).07	B1	Do NOT accept 7/100
6. (d) $\frac{48}{100} \times 82.5$ OR (0).48 × 82.5 = 39.6 **(I.S.W.)**	M1 A1	Any correct method for finding 48% A0 for 39.6%, but allow A1 for £39.6(0)
6. (e) 3 × 12 OR 252÷7 36	M1 A1	Any correct method which should get 36 C.A.O. **Mark final answer.** **36/84 gets M1, A0.** Premature approximation methods such as 3/7 = (0).42 OR (0).43, then 35.28 or 36.12 gets M1,A0 Unsupported answers other than 36 get M0,A0

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2015 Summer Linear Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
Overlay 7. **At least one** 6 by 3 rectangle **At least two** 6 by 4 rectangles **At least two** 4 by 3 rectangles Makes a valid net	 B1 B1 B1 B1	Rectangles must have at least one side in common Notes: Wrong dimensions gets B0; allow ±2mm Ignore 'flaps'. Must be a correct net that would produce **a** cuboid. Allow this B1 even if only 5 sides (open box)
8. (a) (i) Subtract 5 (from the previous term)	B1	Accept –5, take away 5. B0 for n–5 or –5n+51
8. (a) (ii) Multiply (the previous term) by –4	B1	Accept ×–4. B0 for n×–4 B1 for (1) multiply by 4 and change sign OR (2) times the previous term by 4 using a positive then minus number pattern OR (3) B1 for times by 4 each time but every other number is negative B0 for 'times 4 add a minus then times 4 take away the minus'
8. (b) (i) 10b	B1	Accept b × 10 or b10. Ignore b= or =b **or any other letter** **B0 for b buttons ×10 shirts.** **10b = b = 10 gets B0.**
8. (b) (ii) $k/5$	B1	**Allow k÷5.** B0 for k blocks / 5 rows Ignore k= or =k **or any other letter**
9. (a) 4 (°C)	B1	Accept –4 (°C)
9. (b) 97 (°C)	B1	Accept –97 (°C)
9. (c) 2 (°C)	B1	
10. Week hire = 32.20 4 day hire = 16.10 + 3 × 8.15 = (£)40.55 Difference = 40.55 – 32.20 = (£) 8.35	 M1 A1 M1 A1	 FT 'their derived 40.55'
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	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 weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation and grammar.

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2015 Summer Linear Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
All parts (a) to (d) marked together 11. (a) 15 24 28 31 32 39 47 60 Median = 31.5 (years)	 M1 A1	 For identifying the correct TWO middle numbers OR for arranging the 8 numbers in ascending or descending order. C.A.O. Unsupported 31.5 gets M1, A1.
(b) 45 (years)	B1	B0 for 60 – 15 only
(c) Sum of the amounts (276) Sum/8 34.5 (years)	M1 M1 A1	For attempt to add **all** the numbers For dividing a number in the range 216 – 336 by 8. C.A.O.
(d) Because 31 is less than 34.5 the mean will decrease OR because the new member is younger than the mean age **the mean will decrease.**	E2	Consider their reason then consider their conclusion. F.T. their mean **in part (c)** if M1 was awarded E1 for a valid reason or calculating the new mean as 307/9 = 34.1, without a conclusion in their table or in their explanation E0 for 'because you are dividing by a larger number (9)'
12. (a) 950 × 2.12 = 2014 (BND)	M1 A1	 BND not needed. Do not penalise $ but A0 for £ or euros
12.(b) 180/2.12 = (£)84.9(0) OR (£)84.91	M1 A1	 Accept (£)85(.00) Accept unrounded correct answers **84.90(566)** £ not needed but A0 for BND OR $ OR euros.
13. Carpet Tiles (Area of a tile = 0.5×0.5=) 0.25(m^2) **OR(10×4)=40(m^2)** OR (50×50(cm^2) =) 2500 OR **(1000×400=) 400000(cm^2)** (Number of tiles = 40 ÷ 0.25 =)160 **OR (0.25×32)=8** (Number of boxes = 160/32 =) 5 **OR (40÷8 =) 5** (Cost = 5 × £40 =) (£) 200 Wood Strips (No of strips in the 10 by 4 = 40 × 2 =) 80 (Number of packs = 80/8 =) 10 (packs) (Cost = 10 × (£)22 =) (£)220 Carpet tiles cheaper **(by £20)**	✓ B1 B1 B1 B1 B1 B1 B1 E1	 OR **(10÷0.5 =) 20 AND (4÷0.5 =) 8** F.T. 40 ÷ 'their 0.25 OR 'their 20'×'their 8' F.T. 'their 160'/32 F.T. 'their 5'×(£) 40, **provided number of boxes is a whole number ≠ 1 OR 32.** OR (40÷(2×0.25) = 40÷0.5 =) 80 (OR 5×16 =) 80 F.T. 'their 80'/8 F.T. 'their 10' × (£)22, **provided number of packs is a whole number ≠ 1 OR 8.** Conclusion on their figures if at least B1 awarded for 'carpet tiles' AND for 'wood strips'.
14.(a) 30 – x = 44÷2 or 60 – 2x = 44 30 – x = 22 or -2x = 44 – 60 or 60 -44 = 2x or –x=-8 **or 16 = 2x** x = 8	B1 B1 B1	FT until 2nd error FT equivalent level of difficulty *Accept an embedded answer for B3* *Note:* *Writing 2x = -16 or -2x = 16 leading to x = -8 is generally from 1 error.* *Sight of 2x = 44 – 60 is regarded as 1 error* *60 – x = 44 leading to x = 16 is awarded B0, B1, B0 (as level of difficulty is eased)*
14. (b) 8a – 14c	B2	B1 for any TWO correct terms from 12a –6c – 4a – 8c OR B1 for 8a OR B1 for –14c
14. (c) 2, 3, 4, 5	B3	B1 for the 2, B1 for the 5 AND NO 6 or above, B1 for the 3 and 4 AND NO incorrect numbers, but allow 6 here. **SC1 for 5/3 ≤ n < 6 (not 18/3)**
15.(a) Reason to include, without contradiction……. • FreeFlight: fewest complaints • Best2Fly: fewest lost suitcases • GoJet: best arrival on time record	B2	B1 for any 2 correct responses *Allow, if respectively, 'complaints', 'suitcases' or 'arrival time' is mentioned uniquely or if mentioned as the positive feature.*

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2015 Summer Linear Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
15.(b) 30000 – 0.88×30000 OR 0.12×30000 3600 (flights late)	M1 A1	Accept (1 – 0.88) × 30000 *If the incorrect airline is selected, award SC1 for either* *Freeflight or 0.15 × 30000 = 4500 (flights late), or* *GoJet or 0.08 × 30000 = 2400 (flights late)* *Do not accept these as unlabelled unsupported answers; need sight of workings or the airline name as sufficient identification*
15.(c) Use of 0.36 and 0.42 (per 1000 compared) 500×(0.42 – 0.36) OR 500×0.06 OR 500 × 0.42 – 500 × 0.36 or equivalent 30 (suitcases)	B1 M1 A1	Use of (0.)36 and (0.)42 in any calculation(s), or sight of 0.06 **OR 6%.** Ignore consistent place value errors for '500 thousand passengers', e.g. 21(00) – 18(00) **C.A.O. I.S.W.** *If no marks and no working allow SC1 for an answer of 3 or 300 or 3000 or 30000* *GoJet and FreeFlight are mentioned twice in the question, hence no MR or SC marks awarded for use of the incorrect airlines*
15.(d) 8(%)	B1	Do not accept 8/100 or 0.08. **I.S.W. conversion to fractions or decimals.** The answer must be a percentage
16. **SCROLL DOWN FOR SECOND PAGE** (Length common side BD is) 3900 ÷ 75 (BD =) 52 (cm) (Area of triangle BDC =) ½ × 25 × BD (=) 650 (cm^2) (BC^2 =) $25^2 + BD^2$ (BC =) √3329 or $BC^2 = 3329$ (BC =) 57.697…(cm) rounded or truncated	 M1 A1 M1 A1 M1 A1 A1	*Check the diagram for any answers* FT 'their BD', including BD as 25(cm) or spurious BD FT 'their BD' provided both previous M marks awarded FT 'their BD', including BD as 25(cm) or spurious BD FT 'their BD' provided ≠25(cm) and it is not a spurious BD CAO. Do not accept 60 (cm) unless 57(.697…) seen *Alternative for the first 4 marks:* *Base of triangle = ⅓ × base rectangle B1* *Area of the triangle = ⅓ × ½ ×3900 M1* *= 650 (cm^2) A2* *Alternative for the final 3 marks:* ***Complete** method, all stages required to find BC M1* *Intermediate stages answer correct A1* *Final answer correct A1*
17.(a) Explanation, e.g. 'this information was not recorded', 'don't know how many peaches are in the other boxes', 'don't know if boxes have fewer than 8 peaches', 'doesn't show more or less than 8', 'could be fewer than 8 peaches', **'not all boxes may (or will) have 8 peaches'**	E1	Do not accept, e.g. 'because some boxes only had 7 peaches', 'because they should contain exactly 8 peaches (not at least 8)' (given in the question), 'because 2/5 of the boxes are under 8'
17.(b)(i) (8) (18) (25) (32) (41) (10) (20) (30) 40 50 (0.80) 0.9(0) 0.83 0.8(0) 0.82	B2	Must be to appropriate 2dp, although allow 0.9 and 0.8 for 0.90 and 0.80 respectively B1 for any 4 or 5 correct entries
17.(b)(ii) Uniform scale on the vertical axis, suitable for values of relative frequency Correct plots (allow joined or not joined)	M1 A1	Allow not starting at 0, but must be uniform from their first marked value. Do not accept inappropriate scales, the maximum value on the top of the vertical scale must not exceed 2.5, unless clearly working with percentage FT from (i) if possible provided all relative frequencies <1 , or shown as percentages and they are not all identical. Tolerance of plotting is within the appropriate small square *Ignore any 'line of best fit drawn' or additional bars*
17.(b)(iii) 0.82 or equivalent probability	B1	FT from their final decimal in the table in (b)(i) and provided it is <1 Do not accept 0.82% unless a correct equivalent to 0.82 is also seen

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Surname	Centre Number	Candidate Number
Other Names		0

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GCSE

4370/04

A14-4370-04

MATHEMATICS – LINEAR
PAPER 2
FOUNDATION TIER

A.M. MONDAY, 10 November 2014

1 hour 45 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 **8**.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**6**	
2.	**4**	
3.	**6**	
4.	**8**	
5.	**3**	
6.	**4**	
7.	**8**	
8.	**8**	
9.	**7**	
10.	**4**	
11.	**4**	
12.	**4**	
13.	**5**	
14.	**8**	
15.	**5**	
16.	**3**	
17.	**4**	
18.	**5**	
19.	**4**	
Total	**100**	

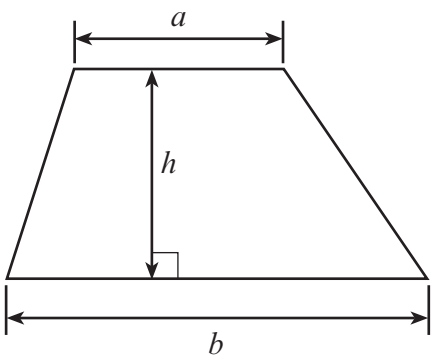
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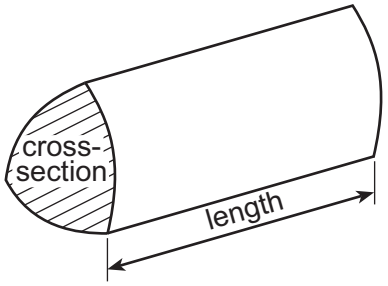
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Formula List

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



Volume of prism = area of cross-section × length



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1. Toby buys

2 jars of coffee at £4.46 each,
3 packets of tea at £3.87 each,
4 packets of sandwiches at £2.32 each.

(a) How much does he spend altogether? [4]

(b) Toby pays with two £20 notes.
How much change does he receive? [2]

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

Weight of a male Year 11 pupil	65 kg	65 g	65 mg	65 km
Capacity of a tea cup	250 cm^2	250 cm^3	250 litres	250 mm^3
Distance from Dover to Calais	41 m	41 cm	41 km	41 mm
Width of an ordinary house window	210 m	210 cm	210 mm	210 km

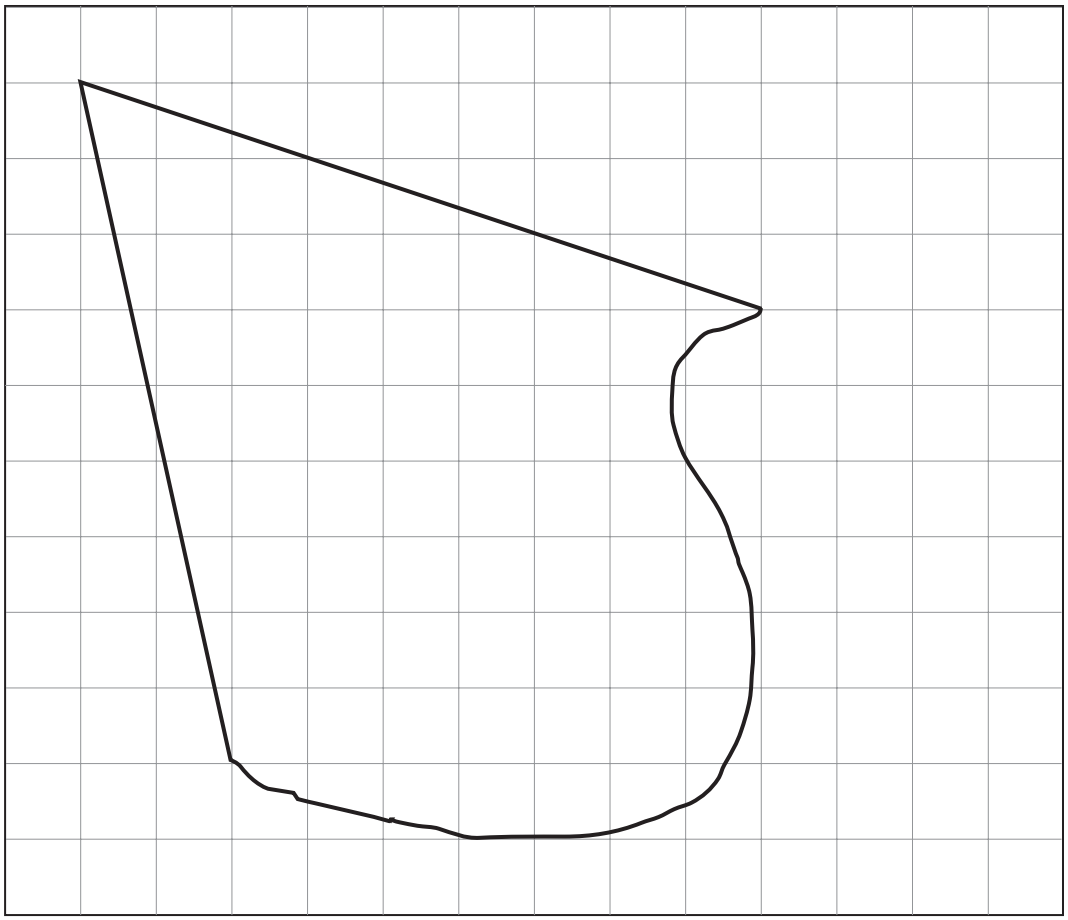
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3. *(a)*



The above shape has been drawn on a centimetre squared grid.
Estimate the area of the above shape. [2]

.....

.....

.....

.....

Area of the shape = ... cm^2

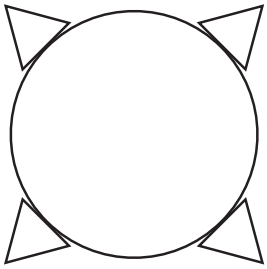
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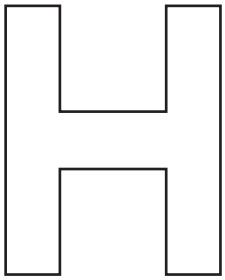
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(b) Draw all the lines of symmetry on the following shapes. [2]

(i)



(ii)



(c) Write down the order of rotational symmetry of the two shapes in part *(b)*. [2]

(i) ..... (ii) .....

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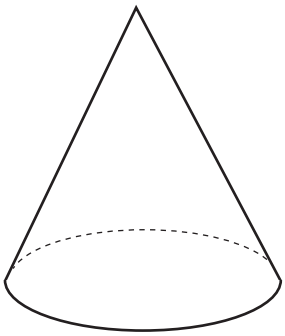
4. *(a)* Write down the special name of the shape shown in each of the following diagrams. [2]

(i)



.....

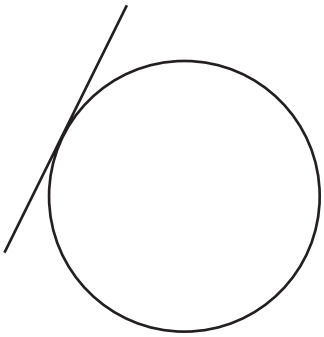
(ii)



.....

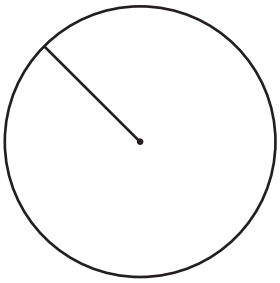
(b) Write down the special name of the straight line shown in each of the following diagrams. [2]

(i)



.....

(ii)



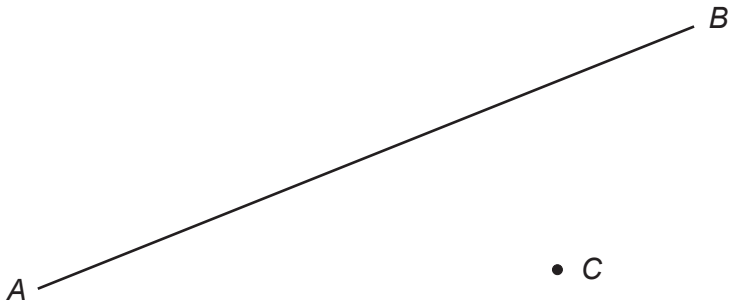
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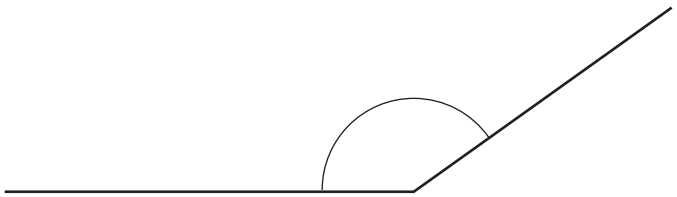
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(c) Draw a line perpendicular to *AB* that passes through *C*. [1]

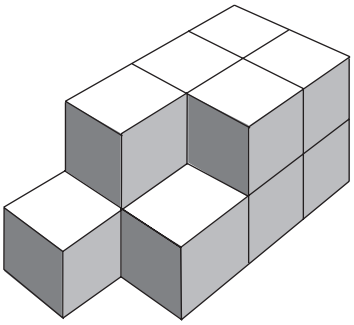


(d) Write down the special name for the angle shown below. [1]



.....

(e) The following solid shape is made up of cubes with sides of 1 cm.
What is the volume of the shape?
Give the units of your answer.
(There are no hidden gaps.) [2]



.....

.....

Volume = ...

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5. Choose the best word from those given below to describe the chance of each of the following events occurring.

impossible **unlikely** **an even chance** **likely** **certain**

(a) Choosing a day of the week with the letter 'b' in it. [1]

.....

(b) No rain falling in Wales during April next year. [1]

.....

(c) Getting an odd number score when a fair dice is rolled once. [1]

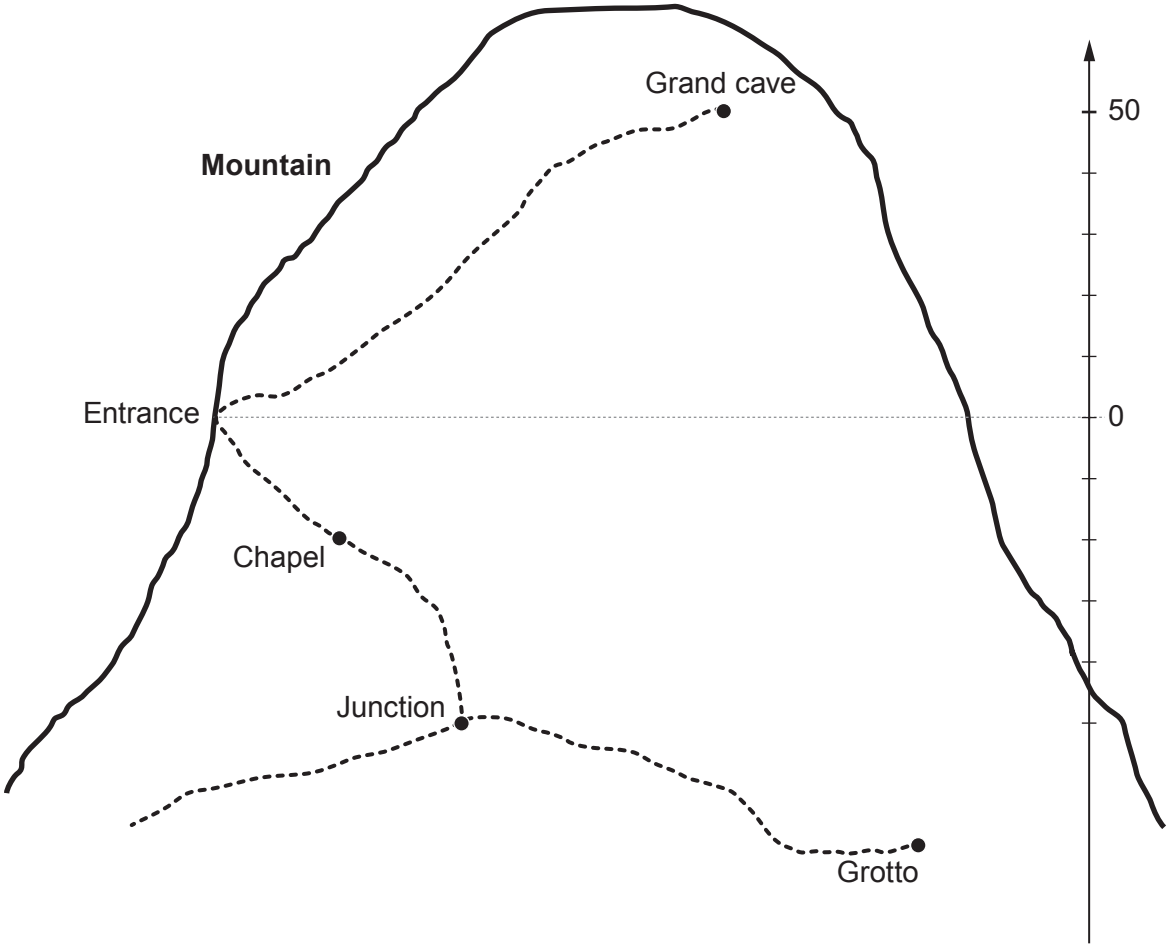
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6. The diagram shows the cross-section plan of underground caves in a mountain.
Taking the 'Entrance' level as 0, the 'Grand cave' is 50 m above the entrance level, or it is at height of +50 m.
The 'Chapel' is at a height of –20 m.



(a) Estimate the height of 'Junction'. [1]

.....

(b) Estimate the height of 'Grotto'. [1]

.....

(c) What is the difference in height

(i) between the 'Grand cave' and the 'Chapel'? [1]

.....

(ii) between the 'Junction' and the 'Grotto'? [1]

.....

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7. The table shows the first class and second class postal charges for large and small letters.

	1st Class		2nd Class	
	Small Letters	Large letters	Small Letters	Large letters
0-100 g	60p	90p	50p	69p
101-250 g	_	£1.20	_	£1.10
251-500 g	_	£1.60	_	£1.40
501-750 g	_	£2.30	_	£1.90
Letters	Size (up to) Length: 24 cm, Width: 16·5 cm, Thickness: 0·5 cm Weight (up to) 100 g			
Large letters	Size (up to) Length: 35·3 cm, Width: 25 cm, Thickness: 2·5 cm Weight (up to) 750 g			

(a) Mark is going to post two large letters each weighing 230 g.
He buys two 1st class stamps.
How much does Mark pay altogether? [2]

.....

.....

(b) Camille posts three large letters.
The weights of the letters are 75 g, 400 g and 650 g.
How much cheaper is it for her to use 2nd class stamps rather than 1st class stamps? [3]

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(c) Rebecca has a letter that weighs 550 g.
It has length 23 cm, width 18 cm and thickness 0·7 cm.
She only has two £1 coins.
Does Rebecca have enough money to post her letter?
You must show all your working and give a reason for your answer. [3]

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

Helen works in a shop.
Her normal working week is 35 hours.
She is paid £8.74 per hour.
When she works for more than 35 hours she is paid a higher amount for each extra hour she works.
Here is her time-sheet for one week when she was paid a total of £358.34.

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Number of hours worked	8	7	9	8	7

Work out the amount she is paid for each extra hour.
You must show all your working. [8]

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9. *(a)* Describe in words the rule for continuing the following sequences.

(i) 48 12 3 0·75 .... [1]

Rule: .....

.....

(ii) 3 9 27 81 .... [1]

Rule: .....

.....

(b) Write down the next 2 terms of the following sequence. [2]

25 24 21 16 9 ....

(c) Simplify $3a + 6a - a$. [1]

.....

(d) Jean rolls a dice many times.
She gets a score of 3 on 7 occasions and a score of 4 on n occasions.
Write down the **total score** of these threes and fours in terms of n. [2]

.....

.....

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Turn over.

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10. Lazslo came on holiday to Wales from Italy.

(a) Lazslo changed 1550€ (euros) into pounds (£).
The rate of exchange was 1€ = £0.84.
How many pounds did he get? [2]

(b) During his stay, Lazslo spent £798 on his accommodation.
Use the same exchange rate to convert this amount into euros. [2]

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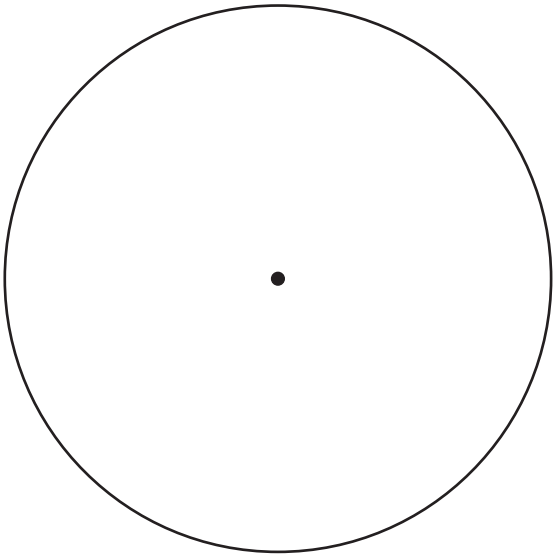
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11. The type of mobile phone owned by each of 240 pupils was recorded. The results are summarised in the table below.

Type of mobile phone	Number of pupils
A	100
B	64
C	40
Other	36

Draw a pie chart to illustrate these results. You should show how you calculate the angles of your pie chart. [4]



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12. Each girl in Year 8 chose her one favourite sport.

$\frac{1}{7}$ of the girls chose football.

$\frac{4}{7}$ of the girls chose volleyball.

The rest of the girls, 30 of them, chose hockey.
How many girls are there in Year 8? [4]

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13. Ms Owen received an electricity bill from Gower Electricity Company.
The bill, with some of the entries missing, is shown below.

Use the information given on the bill to complete all of the missing entries and calculate the total amount that Ms Owen has to pay. [5]

Gower Electricity Company

Bill period 1st July 2014 to 30th September 2014

Ms Owen
3 Sea View Road
Aber
AB31 9ZZ

INVOICE

Meter reading last time	Meter reading this time		Units used	Price of each unit in **pence**	Amount £
1514	2878	Units used	.....	13.3p	.....
		V.A.T. at 5%			.....
		Total charge including V.A.T.			.....
		Amount owing from previous bill			21.15
		Amount to pay			.....

Working:

.....

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Turn over.

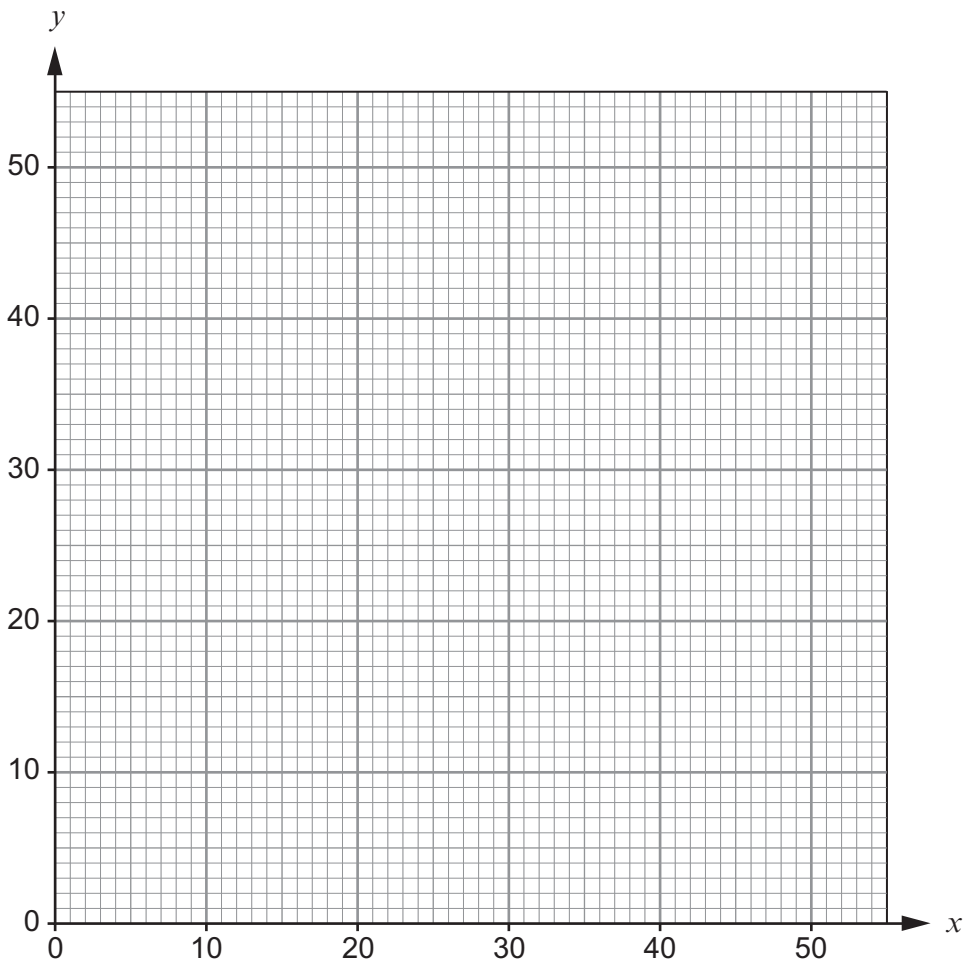
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14. In an experiment, values of x and y are recorded to look for a possible relationship. The table below shows the results.

x	20	36	44	22	38	40	48	8
y	16	32	40	20	34	32	44	6

(a) On the grid below, draw a scatter diagram to show the results. [2]



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(b) The mean of the x values is 32.
Calculate the mean of the y values and then draw a line of best fit on your scatter diagram. [4]

.....

.....

.....

.....

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.....

(c) What type of correlation does your scatter diagram show? [1]

.....

(d) Using your line of best fit, find an approximate value of y when x is 25. [1]

.....

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15. *(a)* The length and width of rectangular television screens are often in the ratio 4 : 3. Calculate the length of the shorter side of such a television screen when the longer side is 36 inches long. [2]

(b) The 'size' of a television screen, given in inches, is the length of the diagonal, as shown in the diagram below.

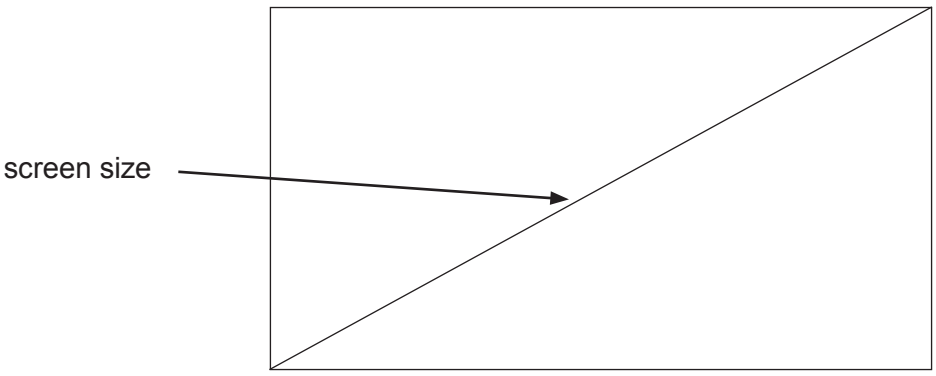


Diagram not drawn to scale

Calculate the screen size of the television described in part *(a)*. [3]

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16. The diagram shows 4 identical large square tiles and 6 identical small square tiles.

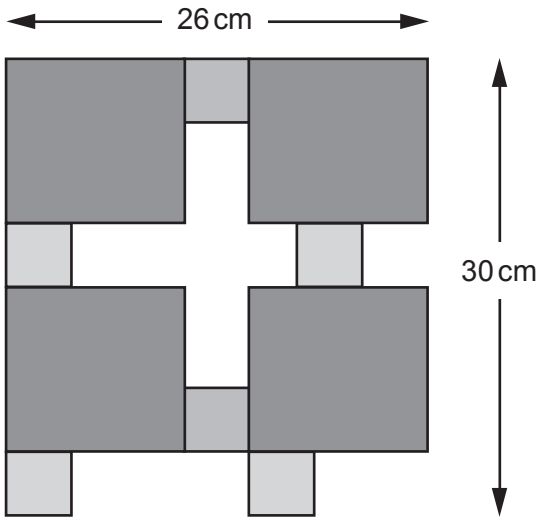


Diagram not drawn to scale

Find the length of one of the large square tiles.
You must show all your working. [3]

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17.

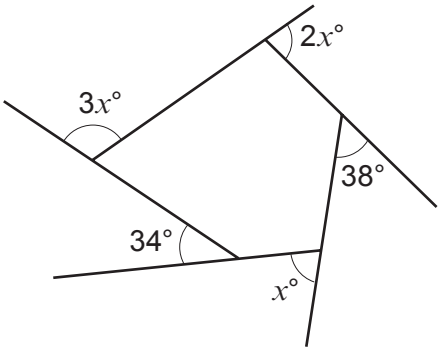


Diagram not drawn to scale

Calculate the value of x. [4]

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18. *(a)* Factorise $6x - 8$. [1]

.....

(b) The nth term of a sequence is $3n^2 - 25$.
Evaluate the 40th term of the sequence. [2]

.....

.....

(c) Write down the nth term of the following sequence. [2]

7, 19, 31, 43, 55, 67, ...

.....

.....

.....

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19. A solution to the equation $x^3 - x - 10 = 0$ lies between 2 and 3.
Use a trial and improvement method to find this solution correct to 1 decimal place. [4]

END OF PAPER

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GCSE MARKING SCHEME

MATHEMATICS - LINEAR

NOVEMBER 2014

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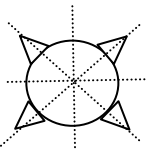
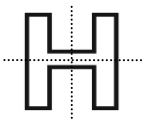
INTRODUCTION

The marking schemes which follow were those used by WJEC for the November 2014 examination in GCSE MATHEMATICS - LINEAR. 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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GCSE Mathematics - Linear Paper 2 (Calculator allowed) Foundation Tier November 2014	Marks	Final Mark Scheme Comments
1. (a) (Coffee) (£) 8.92 (Tea) (£)11.61 (Sandwiches) (£) 9.28 Total (£)29.81 (b) (£)40 – (£)29.81 = (£) 10.19	B1 B1 B1 B1 M1 A1 6	(£) 29.81 implies B4. **F.T. if at least B1 awarded.** FT their total **– (£) 10.19 gets M1, A0**
2. Weight (65kg) 65g 65mg 65km Capacity 250cm^2 (250cm^3) 250litres 250mm^3 Dover/Calais 41m 41cm (41km) 41mm Window 210m (210cm) 210mm 210km	B1 B1 B1 B1 4	
3. (a) Evidence of square counting 57 – 64 **inclusive** (b) (i)  (ii)  (c) (i) 4 (ii) 2	M1 A1 B2 B2 6	B1 for each Lines must be at least drawn within the shapes. B1 for each
4. (a) (i) cylinder (ii) cone (b) (i) tangent (ii) radius (c) Perpendicular (d) Obtuse (Aflem) (e) 12 cm^3	B1 B1 B1 B1 B1 B1 B1 U1 8	Do not accept 'circular prism'. **Allow from right of the 'p' in passes' to the left of the 'r' in 'through' inclusive.** **Welsh: from the right of 'n' in 'mynd' to the left of 'B' in 'AB'** Independent
5. (a) impossible (b) unlikely (c) (an) even(s) (chance)	B1 B1 B1 3	
6. (a) Value –50 ± 2 (m) (b) Value –70 ± 2 (m) (c) (i) 70 (m) (ii) Their (a) – their (b) **OR 20 ± 2 (m)**	B1 B1 B1 B1 4	**Units not required, but penalise incorrect units –1 once only.** **–70 gets B0.** **Difference is positive. –20 gets B0.**

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GCSE Mathematics - Linear Paper 2 (Calculator allowed) Foundation Tier November 2014	Marks	FINAL MARK SCHEME Comments
7. (a) 2 × (£)1.20 = (£)2.4(0) **OR 240(p)** (b) (1st 90 + 1.60 + 2.30 = (£)4.8(0) **OR 480(p)** (2nd 69 + 1.40 + 1.90 = (£)3.99 **OR 399(p)** Difference = (£)0.81 or 81p **SC2 for 70(p) (based on small, large, large letters** (c) Since width >16.5 OR since thickness>0.5 OR since weight > 100g it is a large letter. Letter weighs 550g which is 1st (£)2.30 2nd (£)1.90 Yes, but only if posted 2nd class.	M1 A1 B1 B1 B1 B1 B1 B1 8	**Mark final answer** **Accept (£)1.90 only OR 10p change** *Alternative:* *B2 for sight of 21p, 20p and 40p* *OR B1 for any two of these.* B0 for (0).81p FT their totals provided at least B1 awarded **and 1st class>2nd class.** **Accept 'large letter' only. Can be implied by (£)1.90** **STOP PRESS! - Award B3 for sight of £1.90 AND 'yes' OR 'got £2' OR '10p change'.(No need for mention of 1st Class). Award B2 only for a statement that claims she can post the letter 2nd class but does not mention £1.90.** OR 'She has enough to post 2nd class (but not 1st'.)
8. (Number of hours worked =) 39 (Pay for first 35 hours =) 35 × (£)8.74 = (£)305.9(0) (Pay for extra 4 hours =) (£)52.44 (Rate for these extra hours =) (£)52.44/4 = (£)13.11 **I.S.W.**	B1 M1 A1 B1 M1 A1	FT 358.34 – their 305.90 FT 358.34 – their 305.90 FT ('their 52.44') ('their 39'-35) **Alternative method** **39** **B1** **39×(£)8.74** **M1** **(£)340.86** **A1** **358.34–'their 340.86'** **= (£)17.48** **B1** **17.48/4 = (£)4.37 AND** **(£)4.37 + (£)8.74** **M1** **= (£)13.11 I.S.W.** **A1**
QWC Look for • Spelling • Clarity of text explanations • The use of notation – watch for '=','£', 'p' being used appropriately. QWC2: Candidates will be expected to • present work clearly, with words explaining their processes 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 their processes 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 weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling
9. (a) (i) Divide the previous term by 4 (ii) Multiply the previous term by 3 (b) 0, –11 (c) 8*a* (d) 21 + 4*n* **Mark final answer.**	B1 B1 B2 B1 B2 7	Accept ÷4 OR × ¼. B0 for n/4 **OR 'shared by 4' OR 'halved and halved again'.** B0 for n/4. Accept ×3 B0 for n × 3 B1 for each. F.T. for **'their 0 –11' if negative.** **B0 for '9a – a'** **B1 for sight of 4 x n OR 4n if in an expression of the form '4n + constant (could be 0)'** **In parts (c) and (d) penalise –1 once only for change of letter** **3×7 + 4n gets B1 only. In (d) allow N for n**

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GCSE Mathematics - Linear Paper 2 (Calculator allowed) Foundation Tier November 2014	Marks	FINAL MARK SCHEME Comments			
10. (a) 1550 × 0.84 = (£)1302 (b) 798/0.84 = 950 (euros)	M1 A1 M1 A1 4	£s not required but A0 for euros. euros not required but A0 for £s.	**Alternative method** **1.19 ∈ = £1** **1550 M1** **1.19** **= 1302.52** **If not 1302 then A0.**		
11. 3 or 4 angles correct **and all 4 sectors correctly labelled.** 3 or 4 angles correct, labels not fully correct. 2 angles correct **and these 2 sectors correctly labelled.** 2 angles correct **and these 2 sectors not corr. labelled** 1 angle correct and correctly labelled. OR If 0 OR 1 for their diagram or no diagram, 360/240 Angles are 150°, 96°, 60° and 54°	B4 B3 B3 B2 B1 OR M1 A1 4	Use the overlay and allow ± 2°. Correct labels (Letter/word NOT the frequency OR angle). Accept labels in the form of a key. If B0 **OR B1** scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded **instead of B1**. 1 is 1½° gets the M1. 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. OR SC1 for all percentages: 41·7, 26·7, 16·7, 15 Or rounded OR truncated.			
12. 1/7 + 4/7 = 5/7 2/7 = 30 1/7 = 15 No. of girls = 105	B1 B1 B1 B1 4	F.T. 'their 5/7' F.T. F.T.	**Decimals** **.14 + .57 = .71** **.29 = 30** **30** **.29** **= 103.4**	**B1** **B1** **B1** **B1** **4**	**Percentages** **14%+57%=71%** **etc as for decimals.** **If not 105 then B0.**
13. 1364 181.41(2) 9.07(….) 190.48(26) 211.63(26)	B1 B1 B1 B1 B1 5	C.A.O. F.T. F.T. F.T. F.T. **Final answer must be 2 decimal places**			
14. (a) All points plotted correctly (b) (16+32+40+20+34+32+44+6)/8 28 Line of best fit through **mean point**, (32, 'their 28') (c) Positive (d) From their line of best fit (reading to 1 small square) **OR y in the range 21 to 22 inclusive** **H2**	B2 M1 A1 B2 B1 B1 8	B1 for 5 correct, or reverse correct for 7 or 8 points For intention to add y-values and divide by 8 224/8. Allow slip in y-values used CAO. *Accept unsupported 28* Only award B2 provided at least M1 previously awarded Tolerance within half square if mean point plotted, otherwise intention must be clear. FT 'their 28' provided M1 awarded and their line of best fit has an appropriate skew (but may not have points above and below) B1 for a straight line of best fit, with points above and below, OR for straight line of best fit through the mean point but skewed *(If M0, A0 maximum possible is B1)* FT from straight lines or curves.			
15. (a) 36 ÷ 4 × 3 = 27 **(inches)** (b) $s^2 = 36^2 + 27^2$ s^2 = 1296 +729 = 2025 s = 45 **(inches)** **Mark final answer.**	M1 A1 M1 A1 A1 5	F.T. $s^2 = 36^2$+ (their (a))^2 **Penalise –1 once only for incorrect units** **Unsupported 45 gets all 3 marks.**			

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GCSE Mathematics - Linear Paper 2 (Calculator allowed) Foundation Tier November 2014	Marks	FINAL MARK SCHEME Comments
16. Difference between length and height = Length of one small square = 4 Length of large square = (26 - 4)/2 = 11 (cm) **OR 15 – 4 = 11** OR (30 – 8)/2 = 11	 S1 M1 A1 3	**Also look at their diagram** This is the key step for solving the problem Must signify that 4 is the length of the SMALL square. This could be implied by using the '4' in their further working. F.T. 'their 4' if it is clearly 'their length of a small square'. Watch out for embedded answers, e.g. 11+4+11=26 OR 11+4+11+4=30. **Unsupported 11 gets all 3 marks.**
17. Idea that exterior angle sum is 360° Idea to sum angles, sight of 3x + 2x + x + 38 + 34 (= 6x +72) Equate (their) sum of angles and 360° x° = 48(°) **H4**	B1 B1 B1 B1 4	Sight of (360 – 72 =) 288(°) implies idea of 360° Allow if implied or given with an incorrect equation, e.g. '6x+ 72 = 0', or '3x+2x+x = 540 – 34 – 38', or '3x+2x+x= 468', accept with 'any multiple of 180'- 72 provided >0 (e.g. 108, 288, 468, 648, 828, 1008, …) **C.A.O.** Ignore ° Award B4 for a correct answer, 48 *Interior sum method:* *Interior angles 180-3x, 180-2x, 180-x, 180-38 & 180-34* *AND Sum interior angles (3×180=) 540(°)* *B2* *(or B1 for sight of all the interior angle)* *180-3x + 180-2x + 180-x + 180-38 + 180-34 = 540* *B1* *x(°) = 48(°)* *B1*
18. (a) 2(3x - 4) (b) $3\times40^2 - 25$ 4775 (c) 12n – 5 **OR equivalent** **Only (b) H6(a) & (c) 6(b)(i)**	B1 M1 A1 B2 5	 Must be intention $3\times40\times40$, not for $(3\times40)^2$ Allow, e.g. '3×40 squared - 25', provided not contradicted by further incorrect interpretation in a calculation *Ignore 'n=' throughout (c)* Accept unsimplified form. B1 for 12n
19. One correct evaluation, $2 \le x \le 3$ 2 correct evaluations, $2.25 \le x \le 2.4$, one either side of 0 2 correct evaluations, $2.25 \le x \le 2.35$, one either side of 0 2.3 *No calculations shown: accept "too high", ">", etc.* **H7**	B1 B1 M1 A1 4	x $x^3 - x - 10$ 2 -4 2.1 -2.839 2.2 -1.552 **2.25 -0.859375** **2.3 -0.133** 2.31 0.016391 2.32 0.167168 2.33 0.319337 2.34 0.472904 **2.35 0.627875** 2.36 0.784256 **2.4 1.424** 2.5 3.125 2.6 4.976 2.7 6.983 2.8 9.152 2.9 11.489 3 14 An unsupported answer of '2.3' is awarded SC2

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4370/04

MATHEMATICS – LINEAR
PAPER 2
FOUNDATION TIER

A.M. TUESDAY, 17 June 2014

1 hour 45 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 **3***(b)*.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**6**	
2.	**4**	
3.	**7**	
4.	**5**	
5.	**4**	
6.	**5**	
7.	**5**	
8.	**8**	
9.	**7**	
10.	**6**	
11.	**6**	
12.	**4**	
13.	**5**	
14.	**5**	
15.	**4**	
16.	**6**	
17.	**13**	
Total	**100**	

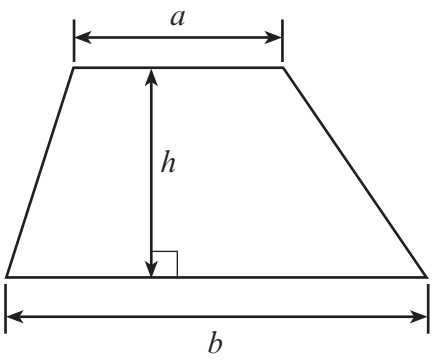
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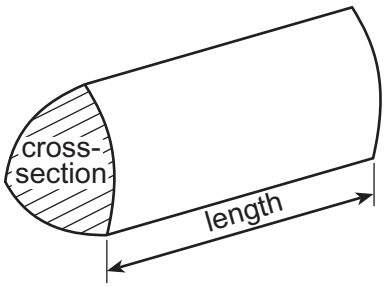
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Formula List

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



Volume of prism = area of cross-section × length



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1. *(a)* Ahmed buys some groceries.
Complete the **four** entries in the following table to show his bill for these items. [4]

Amount	Item	Cost (£)
6 packs	Butter @ £1.24 per pack	.....
4 kg	Sugar @ 86p per kg	.....
..... packs	Currants @ £1.54 per pack	4.62
Total		.....

(b) He gets a 20% discount.
How much is this discount? [2]

.....

.....

.....

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

Height of a man	170 km	170 m	170 mm	170 cm
Weight of a large dog	28 kg	28 g	28 mg	280 g
Capacity of a car's fuel tank	60 cm^3	600 ml	60 litres	6000 litres
Floor area of a room	18 m^2	18 cm^2	18 mm^2	18 cm^3

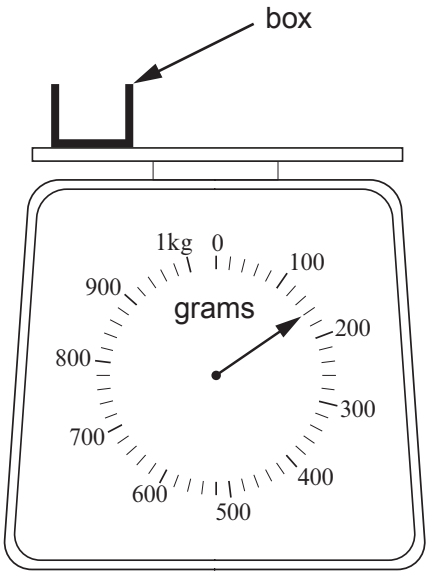
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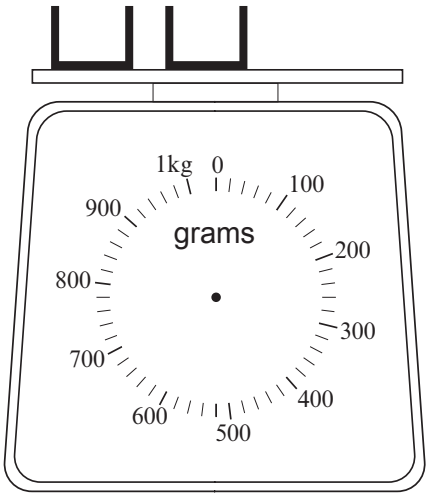
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3. A box is placed on a scale.



(a) Two of these boxes are now placed on the scale.
Draw the pointer on the scale to show how much they weigh. [2]



.....

.....

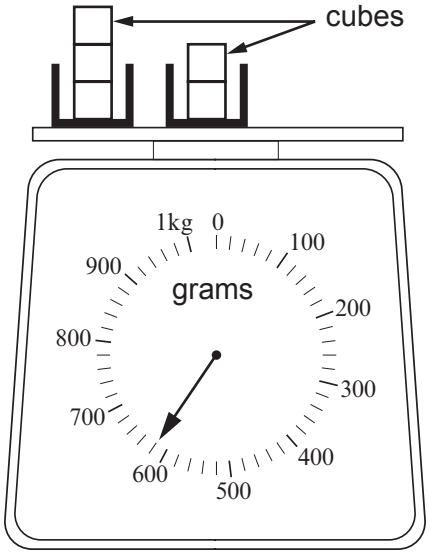
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(b) *You will be assessed on the quality of your written communication in this part of the question.*

Five identical cubes are now placed as shown.
Find how much one cube weighs. [5]



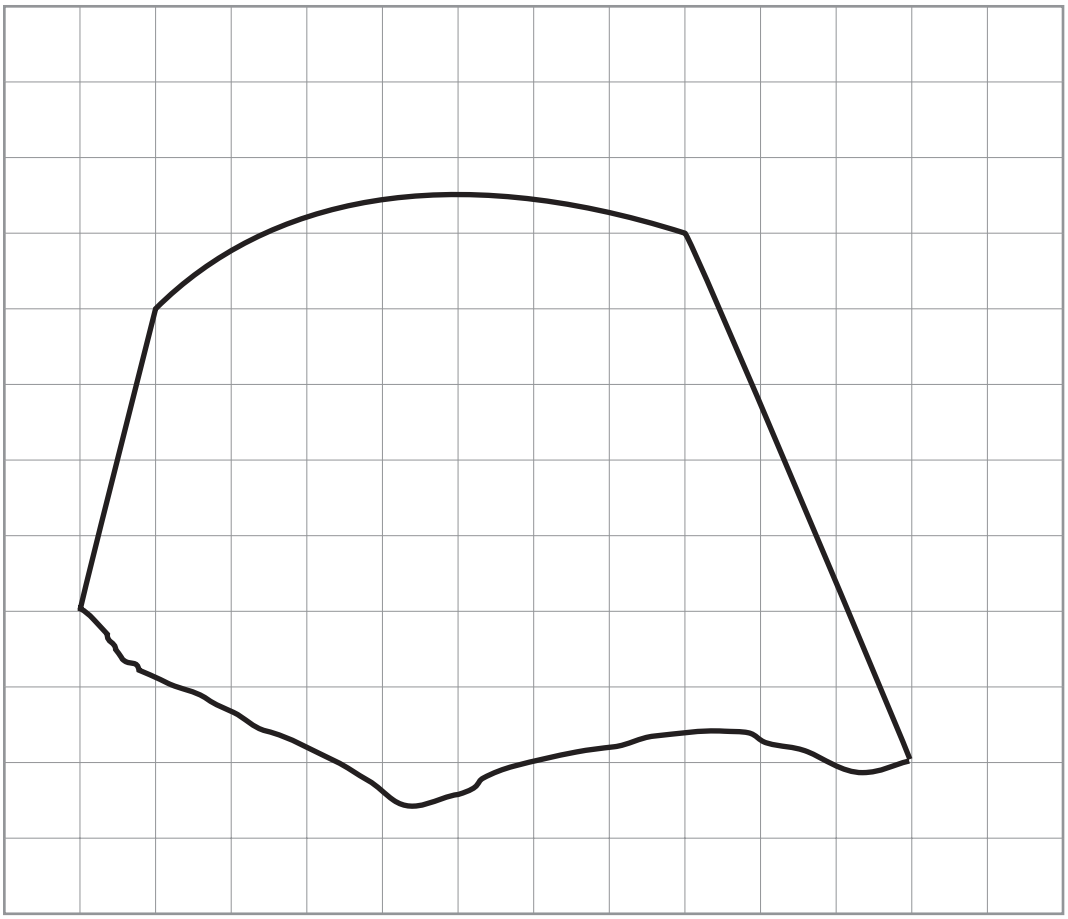
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4. *(a)*



The above shape is the outline of a flowerbed in a park.
It is drawn on a square grid where each square represents an area of 8 m^2.
Estimate the area of the flowerbed. [3]

.....

.....

.....

.....

Area of the flowerbed = ... m^2

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(b) Complete the following figure so that it is symmetrical about the line *PQ*. [2]



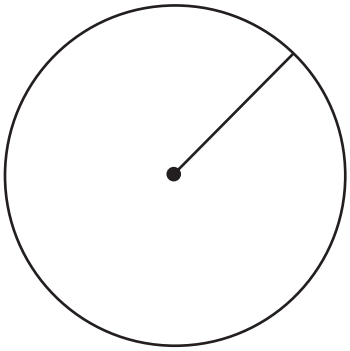
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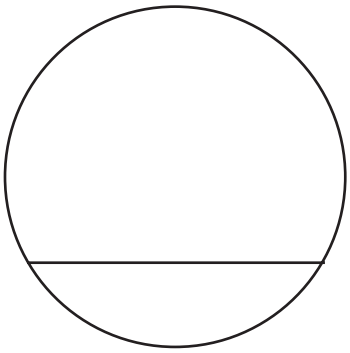
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5. *(a)* Write down the special name of the straight line shown in each of the following diagrams. [2]



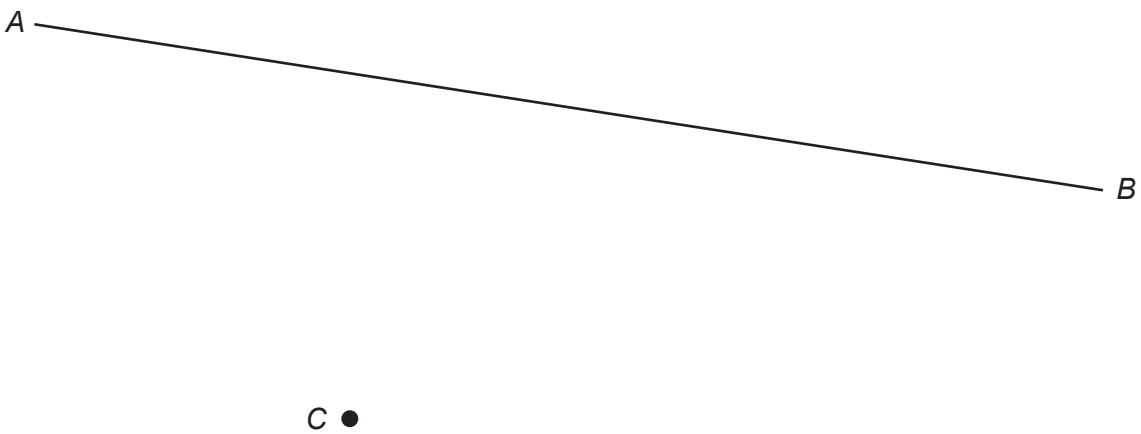
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(b) (i) Measure, in millimetres, the length of the line *AB*. [1]

Length of *AB* = ... mm



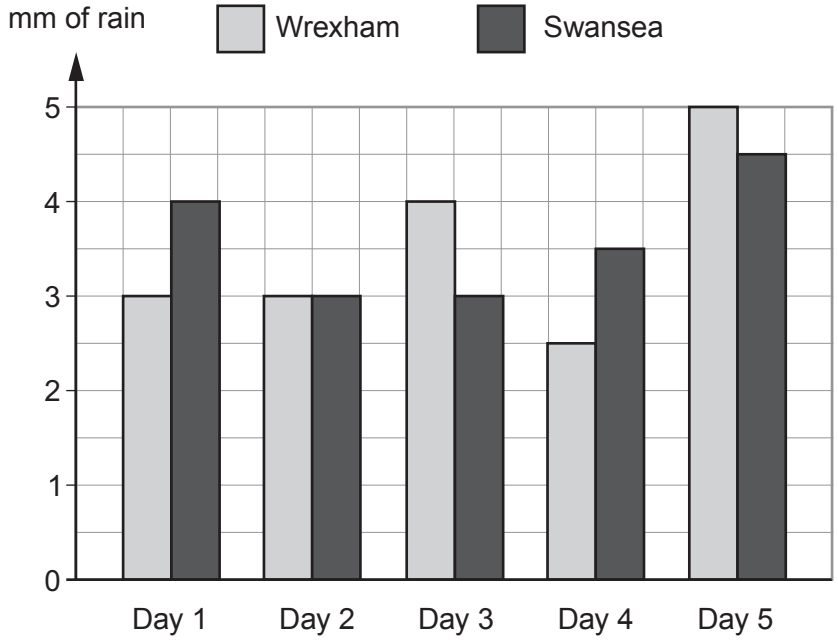
(ii) Draw the line through *C* that is perpendicular to *AB*. [1]

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6. The chart shows the number of millimetres of rainfall recorded in Wrexham and Swansea on five different days.



(a) On which day did Wrexham and Swansea have the same amount of rainfall? [1]

.....

(b) On how many days did Wrexham have less than 4 mm of rainfall? [1]

.....

(c) On how many days was there more rain in Swansea than in Wrexham? [1]

.....

(d) Find the total number of mm of rain that fell on Wrexham over these 5 days. [1]

.....

(e) What was the median number of mm of rain in Swansea over the 5 days? [1]

.....

.....

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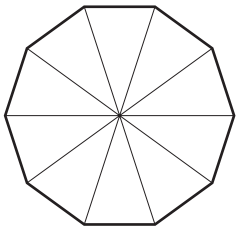
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7. *(a)* Draw a circle around all of the following fractions that are equal to 40%. [2]

$\frac{8}{20}$ $\frac{1}{4}$ $\frac{2}{5}$ $\frac{10}{40}$ $\frac{5}{20}$

(b) Shade 30% of the following figure. [1]



(c) Find, in its simplest form, $\frac{5}{6} - \frac{1}{3}$. [2]

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8. *(a)* Find the value of

(i) $3 - (-4) + (-6)$, [1]

.....

(ii) $20 - 3(-2) + 5(-6)$. [1]

.....

(b) Calculate 87% of 58. [2]

.....

.....

(c) Find the value of each of the following, giving each answer correct to one decimal place.

(i) $\dfrac{75{\cdot}61}{42{\cdot}3 + 6{\cdot}34}$ [2]

.....

(ii) $3{\cdot}4^2 + \sqrt{6{\cdot}457}$ [2]

.....

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9. *(a)* Describe **in words** the rule for continuing each of the following sequences.

(i) 2 9 16 23 30 ..... [1]

Rule:

.....

.....

(ii) 4 –12 36 –108 324 ..... [1]

Rule:

.....

.....

(b) (i) A ticket costs t pounds (£). Write down, in terms of t, the cost of the ticket in pence. [1]

.....

.....

(ii) Joan is h cm tall. Gill is 3 cm shorter than Joan.
Write down Gill's height in terms of h. [1]

.....

.....

(iii) A block weighs w kg.
Write down, in terms of w, the weight of 8 such blocks. [1]

.....

(c) Solve

(i) $3x = 15$, [1]

.....

.....

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(ii) $x + 5 = 16$. [1]

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10. The ages (in years) of the 8 members of an evening class are as follows:

36 28 45 24 31 34 27 47

(a) (i) Find the range of the ages of the members of the class. [1]

.....

.....

(ii) What was the range of their ages one year ago?
Give a reason for your answer. [2]

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(b) Find the mean age of the members of the class. [3]

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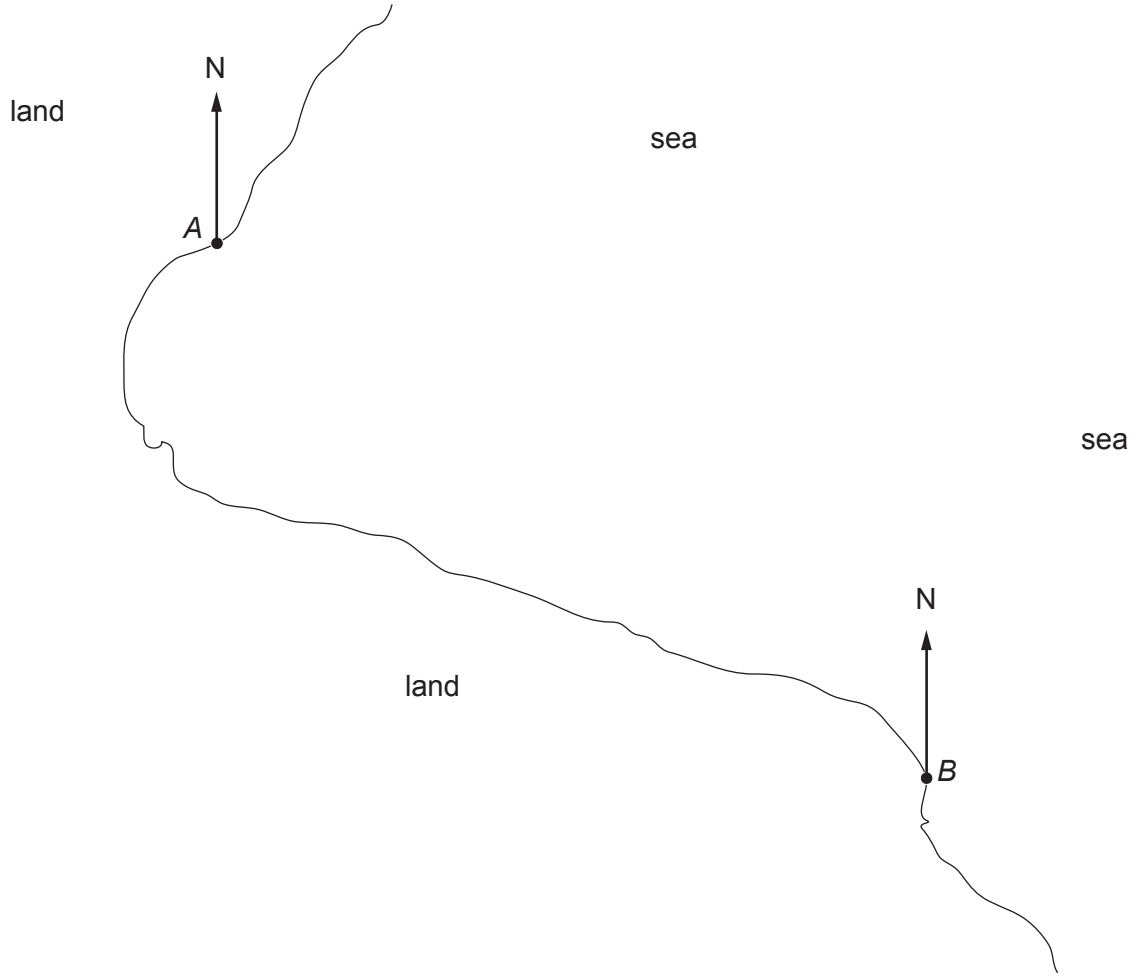
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11. *(a)* *A* and *B* are two ports shown on a map with scale 1 cm = 10 km.
Measure and find the straight line distance, in km, from *A* to *B*. [3]



.....

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(b) A ship is on a bearing of 097° from *A* and on a bearing of 342° from *B*.
Plot the position of the ship and mark it *X*. [3]

.....

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12. *(a)* Geoff changed £1200 into US dollars ($), when the rate of exchange was £1 = $1.52. How many dollars did he get? [2]

.....

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(b) During his stay, Geoff spent $1649 altogether. On his return, he changed his remaining dollars back into pounds, at the same exchange rate. How much did he receive in pounds? [2]

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13. *(a)* Using a ruler and a pair of compasses, construct an angle of 30° at the point *A* on the line below. [3]



(b) Using a ruler and a pair of compasses, draw the perpendicular bisector of the line *PQ*. [2]

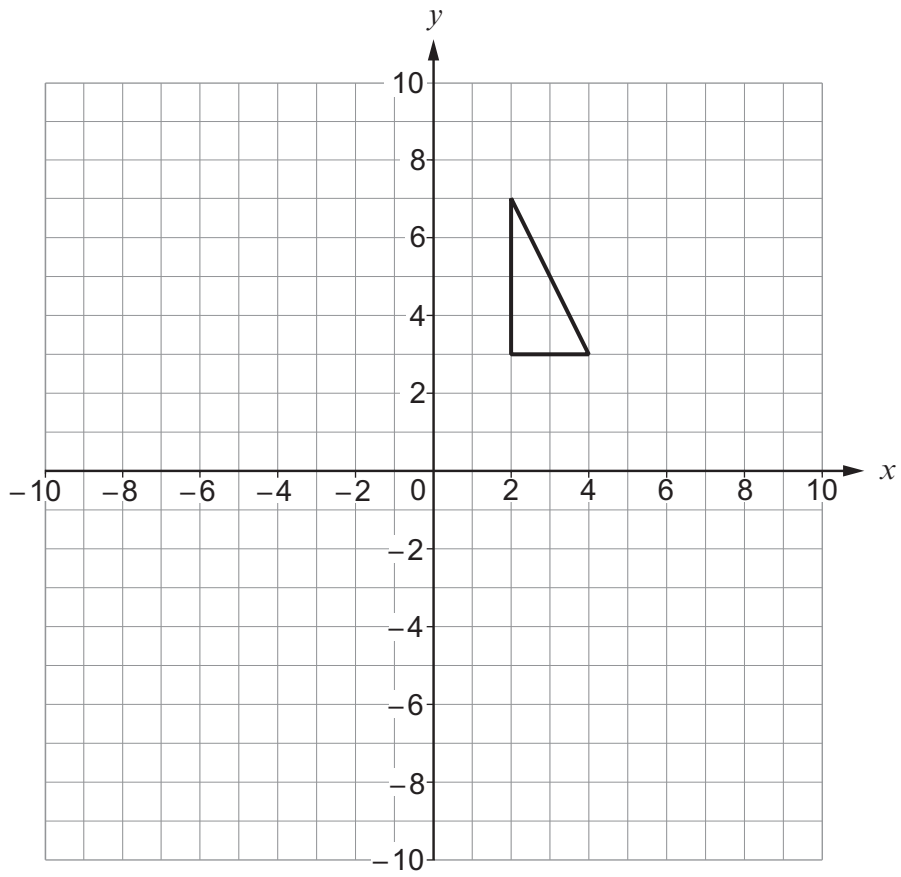


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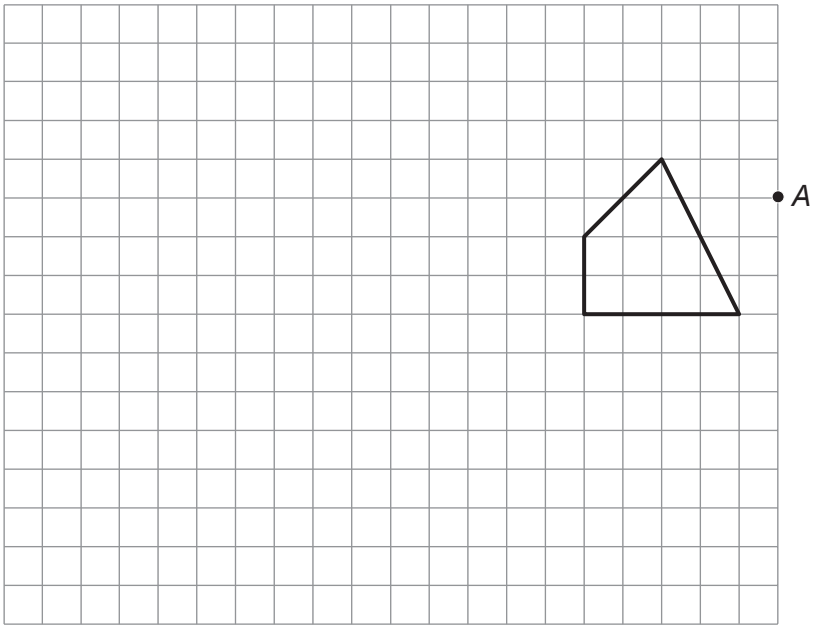
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14. *(a)* Draw a reflection of the triangle in the line $y = 1$. [2]



(b) Enlarge the shape shown on the grid by a scale factor of 2, using *A* as the centre of the enlargement. [3]



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15. The ruling body for international football has rules for the dimensions of rectangular football pitches.

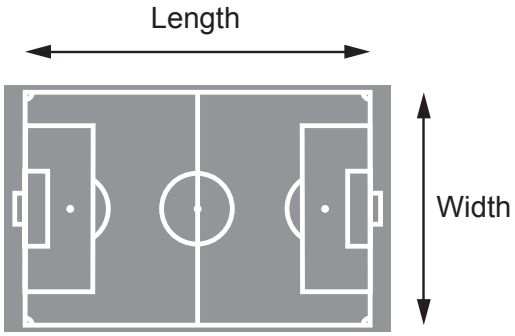


Diagram not drawn to scale

Football pitch dimension rules:

- the minimum width is 45 m
- the maximum width allowed is double the minimum width
- the maximum length is 120 m
- the minimum length allowed is three-quarters of the maximum length

Susan says

'The maximum area of a pitch is **at least 50%** greater than the minimum area of a pitch.'

Is Susan correct?
You must show all your working to justify your answer. [4]

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16. Claudia was given the following information.

UK Income Tax

April 2013 to April 2014

taxable income = gross income – personal allowance

- personal allowance is £9205
- basic rate of tax: 20% on the first £32 255 of taxable income
- higher rate tax: 40% is payable on all taxable income over £32 255

During the tax year 2013 to 2014, Claudia's gross income was £52 250.

Calculate the total amount of tax that Claudia should pay.
You must show all your working. [6]

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17. *(a)* In 2013, there were 119 days on which there was rain or snowfall in Moscow.
For what fraction of the number of days in 2013 was there **no** rain and **no** snowfall in Moscow? [1]

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(b) The mean temperature in Moscow for a 12 month period is 4°C.
It is warmest in July, typically 26°C.
What would be the estimate for the mean temperature in Moscow if the temperature for July was not included? [4]

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(c) One year, during the 31 days in March, the temperature was recorded every day at midday.
The results are shown in the table below.

Midday temperature, t in °C	Number of days
$-12 \leqslant t < -10$	1
$-10 \leqslant t < -8$	3
$-8 \leqslant t < -6$	5
$-6 \leqslant t < -4$	8
$-4 \leqslant t < -2$	4
$-2 \leqslant t < 0$	10

Calculate an estimate for the mean midday March temperature in Moscow.
You must show all your working. [4]

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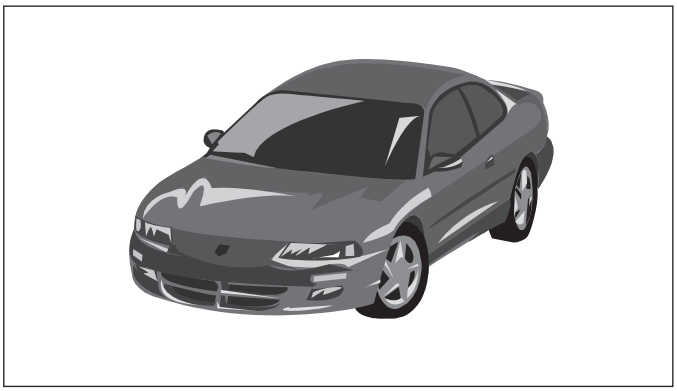
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(d) Boris bought a car in Moscow for 251 850 Russian roubles.



Each year, the value of Boris's car depreciates by 10% of its value at the start of the year. At the end of two years, by how much has the value of Boris's car depreciated? [4]

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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.

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GCSE MARKING SCHEME

MATHEMATICS - LINEAR

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 - LINEAR. 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.

Paper 1 - Foundation Tier	1
Paper 1 - Higher Tier	6
Paper 2 - Foundation Tier	12
Paper 2 - Higher Tier	17

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Summer 2014 Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
1. **Parts (a) & (b) marked at the same time** (a) 7.44 (butter) 3.44 (sugar) 3 (packs) (£4.62) (currants) 15.5(0) (b) (10% =) (£) 1.55 (20% =) (£) 1.55×2 (£) 3.1(0) ISW	 B1 B1 B1 B1 M1 A1	 For the 3 F.T. unless both 7.44 AND 3.44 are incorrect An answer of 15.5 only gets 4 only if ALL answers are correct F.T. their total Any complete correct method for finding 20%. If (£)3.1(0) not given then (£) 12.4(0) gains M1 A1 3.1% OR 3.1p OR £3.1p get M1,A0 but condone £3.1
2. 170 km 170 m 170 mm (170 cm) (28 kg) 28 g 28 mg 280 g 60 cm^3 600 ml (60 litres) 6000 litres (18 m^2) 18 cm^2 18 mm^2 18 cm^3	✓ B1 B1 B1 B1	Tick marked question
To be viewed with diagram **Parts (a) & (b) marked at the same time** 3. (a) Pointer showing 320g 3. (b) Reading 620 (g) One cube weighs (620–320)/5 = 60 (g) Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', g) 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	 B2 ✓ B1 M1 A1 QWC 2	 B1 if calculation shown and F.T. their pointer. OR **B1 for sight of 320 in the working but nothing on their diagram** OR 260 shown on their diagram. Pointer drawn takes precedence over written value(s) Pointer nearer correct mark than the ones each side of it Complete method, subtraction and division FT 'their 620 and 320' Allow B1, SC1 for 620/5 = 124 (g) **Unsupported 124 (g) gets M0,A0** 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 weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation or grammar.

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Summer 2014 Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
To be viewed with diagram 4. (a) Evidence of square counting 57 – 63 inclusive 456 – 504 inclusive (m^2)	M1 A1 B1	Inside the shape. Condone answers like 60^2 here. F.T. 'their number of squares' × 8 Unsupported answers in the range 456 – 504 inclusive get all 3 marks, **Mark final answer** 57 456 58 464 59 472 60 480 61 488 62 496 63 504
To be viewed with diagram 4. (b) Lines Arc	B1 B1	F.T. correct curvature up to the start of 'their line' **Maximum of B1 if extra parts drawn**
5. (a) radius chord	B1 B1	
To be viewed with diagram 5. (b) (i) **141 (mm) to 145 (mm) inclusive**	B1	
To be viewed with diagram 5. (b) (ii) Perpendicular through C	B1	**Allow from the leftmost 'e' in 'millimetres' to the 'e' in 'the' in 'the length' inclusive.** **Welsh: from the first 'm' to the 'a' in milimetrau**
To be viewed with diagram **Parts (a) to (e) marked at the same time** 6. (a) (Day) 2 (b) 3 (days) (c) 2 (days) (d) 17.5 (mm) **OR 17½ (mm)** (e) 3·5 (mm)	 B1 B1 B1 B1 B1	 Allow 'on day 1, day 2 and day 4' Allow 'on day 1 and day' 4
7. (a) $\frac{8}{20}$ $\frac{1}{4}$ $\frac{2}{5}$ $\frac{10}{40}$ $\frac{5}{20}$	B2	B1 for either one correct AND none incorrect OR for both correct and 1 incorrect
7. (b) 3 shaded sectors	B1	
7. (c) $\frac{5}{6} - \frac{2}{6}$ (= 3/6) = 1/2	M1 A1	Or equivalent correct method Must be ½. Unsupported 3/6 gets M1, A0 M1, A1 for (0).5
8. (a) (i) 1	B1	
8. (a) (ii) –4	B1	
8. (b) 87/100 × 58 = 50.46	M1 A1	Any correct method for finding 87%. 50.46% gets M1, A0, but M1, A1 for £50.46 Unsupported 50.4 OR 50.5 gets M1, A0 **50.46 seen then with further rounding still gets M1,A1**
8. (c) (i) 1.6	B2	B1 for 1.55(44819 ...). All places given must be correct rounded or truncated. B1 for 1.5
8. (c) (ii) 14.1	B2	B1 for 14.10(10627 ...) All places given must be correct rounded or truncated.

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Summer 2014 Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
9. (a) (i) Add 7 to the previous term	B1	Accept +7, 'goes up in 7s', 'a gap of 7' B0 for n+7 OR 7n–5
9. (a) (ii) Multiply the previous term by –3	B1	Accept ×–3. B0 for –3n OR n × –3 **B1 for 'multiply by 3 and change the sign'.**
9. (b) (i) 100t (p)	B1	Accept t×100, 100×t, t100, and e.g. t×100 =t Condone change of letters. Ignore £ or p. **B1 for 100tp but B0 for 100p**
9. (b) (ii) h – 3 (cm)	B1	Condone change of letters. Allow h = h–3 Ignore cm
9. (b) (iii) $8w$ (kg)	B1	Accept 8×w, w8, w×8, and e.g. 8w = w Condone change of letters. Ignore kg. B0 for 8000w, B1 for 8000w g
9. (c) (i) (x=) 5	B1	Accept embedded answers such as 3×5 = 15 but B0 for 3×5 only. **B0 for x = 3×5 = 15**
9. (c) (ii) (x=) 11	B1	Accept embedded answers such as 11 + 5 = 16. B0 for 11 + 5 = 16x OR 11x **OR B0 for only 11 + 5**
Parts (a) & (b) marked at the same time 10. (a) (i) 23 (years) (a) (ii) 23 (years) The 24 becomes 23 and the 47 becomes 46 O R Both ends are 1 less (b) Sum of the numbers (272) Sum/8 = 34 (years)	 B1 B1 E1 M1 M1 A1	 Comes from 47 – 24 F.T. 'their (a)(i)' 46 –23 = 23 gets the B1 and E1 B1, E1 for a list of the ages (each 1 less) and correct answer **E0 for 'they are the same people'** For attempt to add the numbers For dividing a number in the range 220 – 320 inclusive by 8. C.A.O.	Notes In part (a)(ii) accept For example, 23 because everyone would be 1 year younger OR 23 because the difference in their ages hasn't changed
11. **Parts (a) & (b) marked at the same time** (a) 11·8 (cm) 11·8 × 10 = 118 (km) **To be viewed with diagram** (b) **Use Overlay** Bearing 097º from A Bearing 342º from B Point (X)	 B1 M1 A1 M1 M1 A1	 Allow 11·6 – 12·0 inclusive (Ignore km here) FT 'their 11·8'×10 km not required but A0 for incorrect units Unsupported answers within 116–120 inc get B1,M1,A1. Unsupported answers outside 116–120 inclusive get 0. Allow ±2° Allow ±2° F.T. if at least M1 awarded. Unambiguous dots within the boundaries of the overlay can get the M1s. One unambiguous dot within the 'box' gets all 3 marks. Watch out for line segments. An unambiguous point of intersection does not require X.	
Parts (a) & (b) marked at the same time 12. (a) (Number of dollars =) 1200 × 1.52 = (**$**) 1824 ISW (b) (1824 – 1649) ÷ 1.52 OR 175 ÷ 1.52 = (£)115.13 ISW	 M1 A1 M1 A1	 $ not required but £ gets A0. F.T. 'their ($)1824' £ not required but $ gets A0. Accept (£)115 but A0 for (£)115.1	

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Summer 2014 Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
Use Overlay 13. (a) Arcs to show 60º or 120º Arcs to bisect the 60º Line to show angle of 30º	M1 **m1** A1	We need to watch out for the case where there is no arc on the line. Candidates could have used the length of the line to set their compass length and placed the compass point at the end of the line. In this case there will only be arcs above the line. If not drawn at A – mark as if at A and penalise –1
Use Overlay 13. (b) Correct intersecting arcs Perpendicular line	M1 A1	There must be 2 pairs of intersecting arcs for M1. (Some candidates draw 1 pair of arcs and join up the intersection of these to the midpoint of the line (found by measurement?) which is incorrect M0,A0). 2 arcs drawn with radius 0.5PQ and centred at P and Q is incorrect and gets 0 marks.
14.(a) Correct reflection	B2	B1 for the sight of the line y = 1, or a reflection in any horizontal line B0 if more than one triangle drawn, unless all are reflections in a horizontal line
Use overlay 14.(b) Correct enlargement Correct position	B2 B1	B1 for any two adjacent lines correct Intention of correct placement, i.e. with appropriate rays seen, or correct positioning of at least two vertices *Penalise consistent incorrect scale factor -1*
To be viewed with diagram 15.(a) (maximum width is 2 × 45 =) 90 (m) **AND** (minimum length is ¾ × 120 =) 90 (m) (maximum area is 90 × 120 =) 10800 (m^2) **AND** (minimum area is 45 × 90 =) 4050 (m^2) 4050 × 1.5 = 6075 (m^2 <10800 m^2) **OR** 100×10800/4050 = 266.6(6…% >150%) **OR** 100 ×(10800 – 4050)/4050 = 166.6(6..% >50%) **OR** similar appropriate check against Susan's statement, e.g. 2×4050 = 8100 (<10800m^2) Conclusion that Susan **is correct** based on calculations, e.g. 'it is at least 50% greater, in fact it is (much) more' following from an appropriate calculation, or '6075 (m^2) <10800 (m^2)', or '100×(10800 – 4050)/4050 = 166.6(6..)% >50%, or '100×10800/4050 = 266.6(6…%) >150(%)', or 'Twice 4050 is less than 10800'	✓ B1 B1 B1 E1	Sight of 90(m) TWICE if unlabelled (max width & min length) Both areas correct FT 'their 2×45' × 120 correctly evaluated **AND** 45 × 'their ¾ ×120' correctly evaluated *If neither of the previous B1s awarded, then award SC1 for sight of 90(m) and one correct (FT) area* The award of this mark requires a correct evaluation of the candidate's check. Must show **correct** evaluation FT 'their 4050'× 1.5 correctly evaluated, or 100× 'their max area' / 'their min area' correctly evaluated, or similar appropriate check. *Do not accept 50% of 10800 or 5400, B0, unless applied appropriately. Allow FT from this type of comparison. However, sight of 4050<5400 is an appropriate comparison, hence B1 (and may also gain E1)* Allow 'is correct' implied, do not accept 'not correct' Accept that there may be errors in calculations, but that it is a conclusion based on attempting to work with area *Watch for incorrect conclusion following correct working.* FT appropriate conclusion based on their working provided the candidate has attempted to work with **area**. No working shown, then E0 *Alternative:* *2×4/3* *B2* *= 8/3* *B1* *Appropriate conclusion* *E1* ***Allow responses that clearly engage with the concept that doubling the width will result is an area that is at least 50% greater.***

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Summer 2014 Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
16. Taxable income (52250 – 9205=) (£)43045 40% tax to be paid on (£)10790 0.2 × 32255 (=6451) 0.4 × 10790 (=4316) (£) 6451 AND (£)4316 Claudia's tax should be (£)10767	B1 B1 M1 M1 A1 A1	 FT 'taxable income' – 32255, i.e. 'their 52250 -9205' – 32255 correctly evaluated FT 0.4 × ('their 43045' – 32255) provided 'their 43045' > 32255, also FT (52250 – 32255 =) giving 0.4 × 19995 (=7998) FT sum of 'their 6451' + 'their 4316' provided at least 1 of these values is correct and M2 awarded *(Note: 6451 + 7998 = 14449)*
17.(a) 246/365 ISW	B1	Allow 247/366
17.(b) Total for 12 months (= 12 × 4 =) 48(°C) 11 months 48 - 26 (=22) ÷ 11 = 2(°C)	B1 M1 m1 A1	 FT 'their 12×4' *Award B4 for an unsupported answer of 2(°C)* *Sight of 48 – 26/12 is B1 only,* *Sight of (48-26)/12 is B1, M1 only*
17.(c) Mid points -1, -3, -5, -7, -9, -11 -11×1 + -9×3 + -7×5 + -5×8 + -3×4 + -1×10 (Σfx = -135) their Σfx/31 -4.3548…(°C) rounded or truncated to 1 or more d.p.	B1 M1 m1 A1	Sight of any 3 correct values, with no incorrect values FT their mid points from within appropriate groups, or at bounds of the groups FT their Σfx/31 correctly evaluated. Must be negative. Accept -4, -4.4 or -4.3 only from correct working Award B4 unsupported -4.35 Omitted negative sign, penalise -1 only, then follow mark scheme as above.
17.(d) Any correct 10% of a value seen in working 251850 – 0.10 × 251850 (= 251850 – **25185**) 226665 – 0.10 × 226665 (= 226665 – **22666.5**) 47851.5(0 Russian roubles)	B1 M1 A2	OR **B1and M1 for 251850 × 0.90^2** **B1 and M0 for 251850 × 0.90** Two different 10% OR sight of 0.10 × 251850 AND 0.10 × 226665 (25185 AND 22666.5) Accept 47851 or 47852 (roubles) A1 for 203998.5(0), 203998 or 203999 (roubles) *Appreciate: B1 and SC1 for 304738.5(0) and 52888.5(0)* *Simple interest, accept a correct 20% for B1 only (50370)*

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4370/04

MATHEMATICS – LINEAR
PAPER 2
FOUNDATION TIER

A.M. MONDAY, 11 November 2013

1 hour 45 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 **6***(c)*.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**6**	
2.	**4**	
3.	**4**	
4.	**4**	
5.	**4**	
6.	**9**	
7.	**5**	
8.	**6**	
9.	**6**	
10.	**4**	
11.	**6**	
12.	**4**	
13.	**7**	
14.	**5**	
15.	**4**	
16.	**8**	
17.	**7**	
18.	**7**	
Total	**100**	

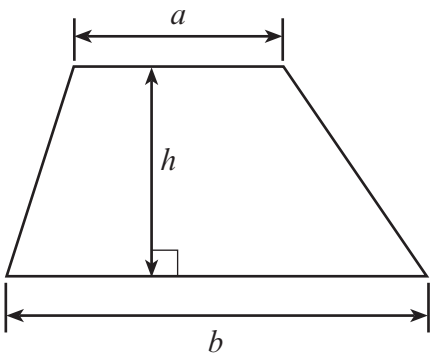
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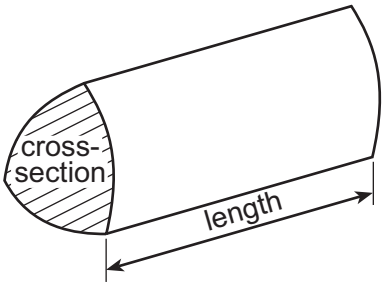
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Formula List

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



Volume of prism = area of cross-section × length



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1. *(a)* Sam's parents buy him some clothes ready for the start of the school term. Complete the following table to show their bill for these items. [4]

Item	Cost (£)
4 pairs of trousers @ £14.99 a pair	59.96
10 pairs of socks @ £3.27 a pair	
6 shirts @ £18.46 FOR TWO	
2 pairs of shoes @ £32.68 a pair	
Total	

(b) They get a 5% discount.
How much is this discount? [2]

.....

.....

.....

2. **Circle** the quantity that is the appropriate estimate for each of the following. [4]

Distance from London to Coventry	160 mm	160 cm	160 m	160 km
Weight of a large dog	35 kg	350 kg	35 mg	35 g
Capacity of a small jug	35 litres	350 litres	350 ml	35 mm^3
Height of a door	1900 cm	190 cm	19 cm	190 mm

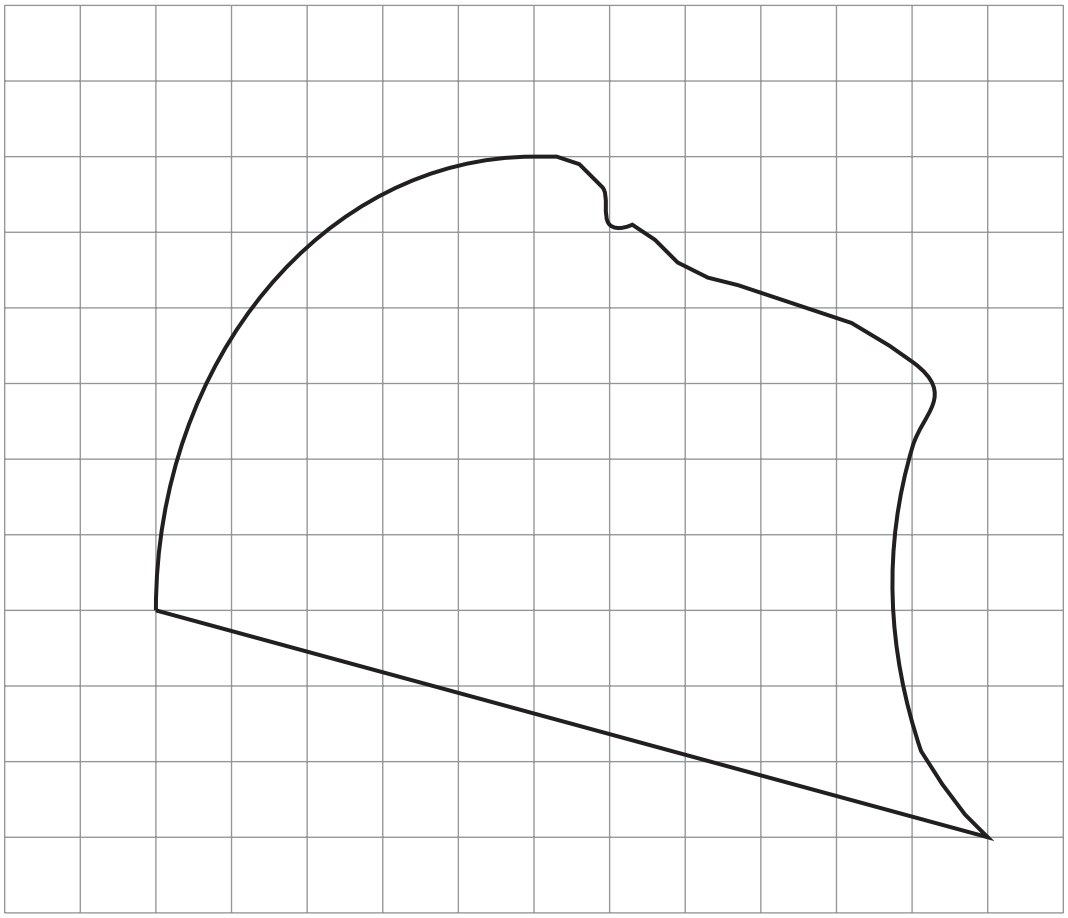
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3. *(a)*



The above shape has been drawn on a centimetre squared grid.
Estimate the area of the above shape. [2]

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.....

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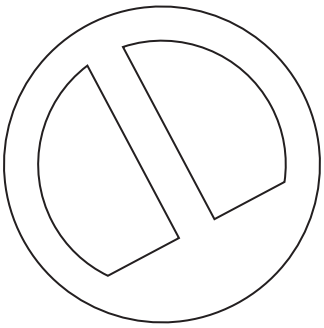
Area of the shape = ... cm^2

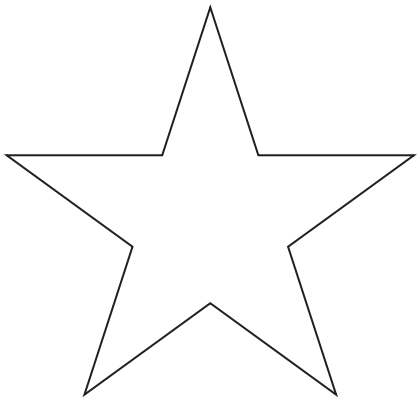
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(b) Draw all the lines of symmetry on the following shapes. [2]





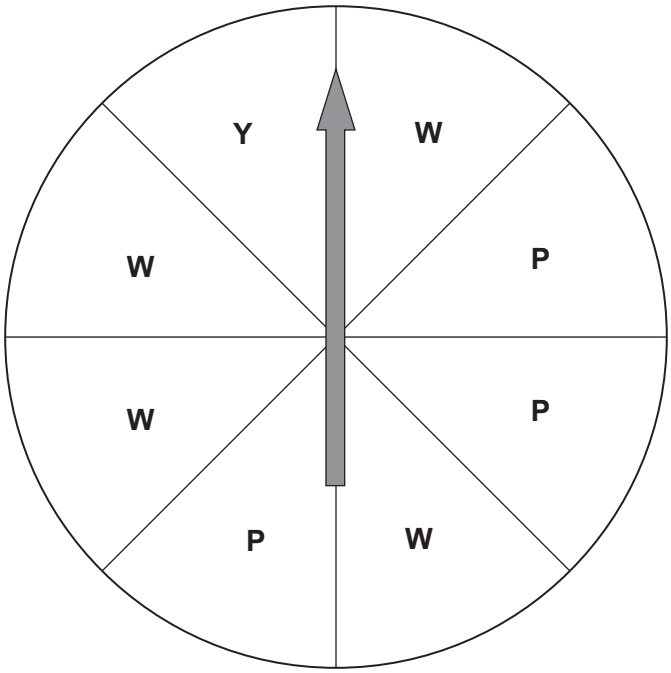
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4. *(a)* Charlotte has a spinner with 8 identical sections, except for their colour.
Some are coloured white (W), some are pink (P) and one is coloured yellow (Y), as shown below.

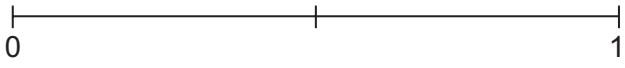


The arrow is spun and it stops at random on a coloured section.
On the probability scale shown below, mark the points **A**, **B** and **C** where

A is the probability that the arrow stops on white,

B is the probability that the arrow does NOT stop on yellow,

C is the probability that the arrow stops on red. [3]



(b) Circle the best expression from those given below to describe the chance of the event B occurring. [1]

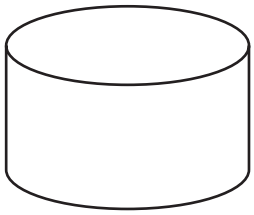
impossible **unlikely** **an even chance** **likely** **certain**

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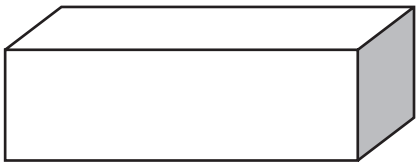
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5. *(a)* Write down the special name of the shape shown in each of the following diagrams. [2]

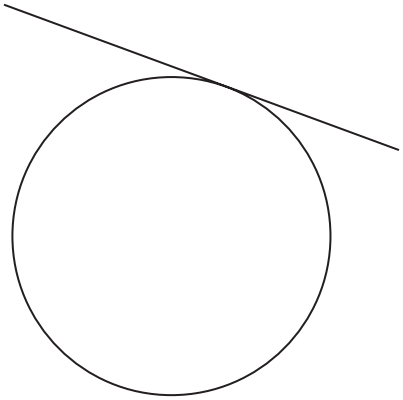


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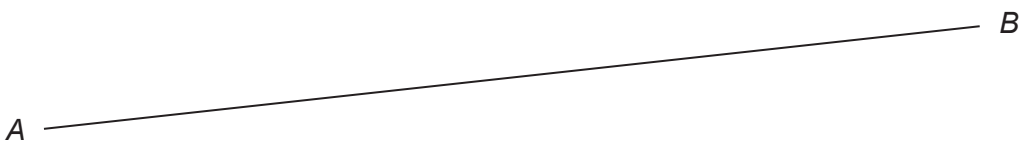
.....

(b) Write down the special name given to the straight line in the following diagram. [1]



.....

(c) Draw a line perpendicular to *AB* that passes through *C*. [1]





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6. The following table gives the postal charges for sending letters, small packets and printed papers over 100 g to various parts of the world.

Letters, Small Packets and Printed Papers over 100 g

Weight up to and including	UK & Europe	World Zone 1	World Zone 2
150 g	£2.93	£3.86	£3.90
200 g	£3.16	£4.42	£4.50
250 g	£3.39	£4.98	£5.10
300 g	£3.62	£5.54	£5.70
400 g	£4.22	£6.76	£6.98
500 g	£4.82	£7.98	£8.26
600 g	£5.42	£9.20	£9.54
700 g	£6.02	£10.42	£10.82
800 g	£6.62	£11.64	£12.10
900 g	£7.22	£12.86	£13.38
1000 g	£7.82	£14.08	£14.66
2000 g	£13.82	£26.28	£27.46
For each additional 100 g, or part thereof, add			
	60p	£1.22	£1.28

World Zone 1
USA
South America
Canada
Africa
Far East

World Zone 2
Australia
New Zealand

(a) What is the cost of sending a letter weighing 200 g to Europe? [1]

.....

.....

(b) What is the cost of sending a package weighing 585 g to Canada? [1]

.....

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

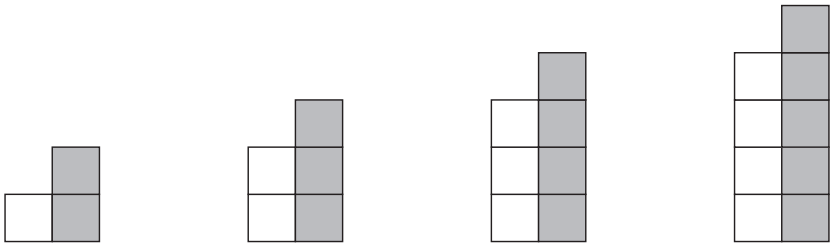
Gethin sends a package weighing 2460 g to New Zealand.
How much change should he get from £40?
You must show all your working. [7]

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7. The following patterns have been made using shaded and unshaded squares.



Pattern 1 2 3 4

(a) How many shaded squares will there be in pattern 100? [1]

.....

(b) How many squares will there be in pattern 60 altogether? [2]

.....

.....

(c) Which pattern will have 81 squares altogether? [2]

.....

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8. *(a)* Describe, **in words**, the rule for continuing the following sequences.

(i) 4, 16, 28, 40, 52, ... [1]

Rule: .....

.....

(ii) 3, −9, 27, −81, 243, ... [1]

Rule: .....

.....

(b) Use the formula $F = 6G + 10H$ to find the value of F when $G = 12$ and $H = 3$. [2]

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(c) A magazine costs m pence. Write down, in terms of m, the cost of 8 magazines

(i) in pence, [1]

Cost = ... pence

(ii) in pounds (£). [1]

Cost = £ .....

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9. The marks obtained by Colin in eight subjects were as follows.

66 45 59 55 65 69 45 72

(a) Find the mean of these eight marks. [3]

(b) Find the range of the marks. [1]

(c) Find the median mark. [2]

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10. An express coach travelled from Bristol to Swansea.
It stopped at a motorway services on the way.
The travel graph below represents its journey from leaving Bristol up to the time it left the motorway services.

(a) How far from Swansea was the coach when it started out? [1]

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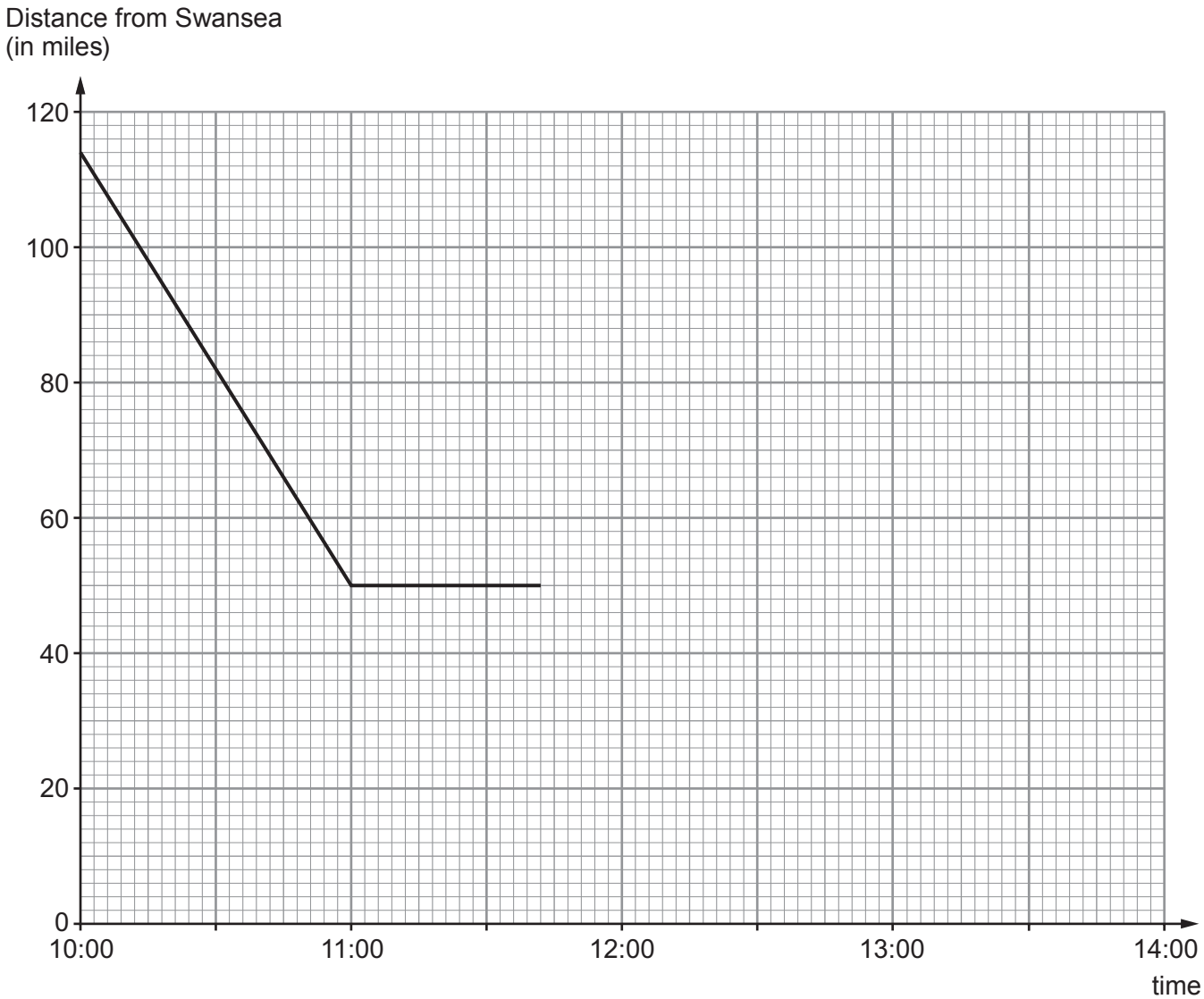
(b) How far did the coach travel in the first hour? [1]

.....

(c) For how many minutes did the coach stop at the motorway services? [1]

.....

(d) After stopping at the motorway services, the coach was driven at a steady speed reaching Swansea at 13:39.
Draw the graph for this part of its journey. [1]



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11. *(a)* What percentage is £95 of £250? [2]

(b) Berwyn wants to hire a car. He sees the following advertisement.

> **Cars for hire**
>
> £35.60 in total for the first 2 days,
> then £16 per day

He hires a car and his bill comes to £163.60.
For how many days did he hire the car? [4]

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12. Faizal has £400.

He spends $\frac{1}{4}$ of it on rent and $\frac{2}{5}$ of it on food.

What fraction does he have left?
Write your answer in its simplest terms. [4]

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13. *(a)* Complete an accurate drawing of triangle PQR in which $QR = 14$ cm, $\hat{PQR} = 48°$ and $\hat{PRQ} = 67°$.
The side QR has been drawn for you. [3]

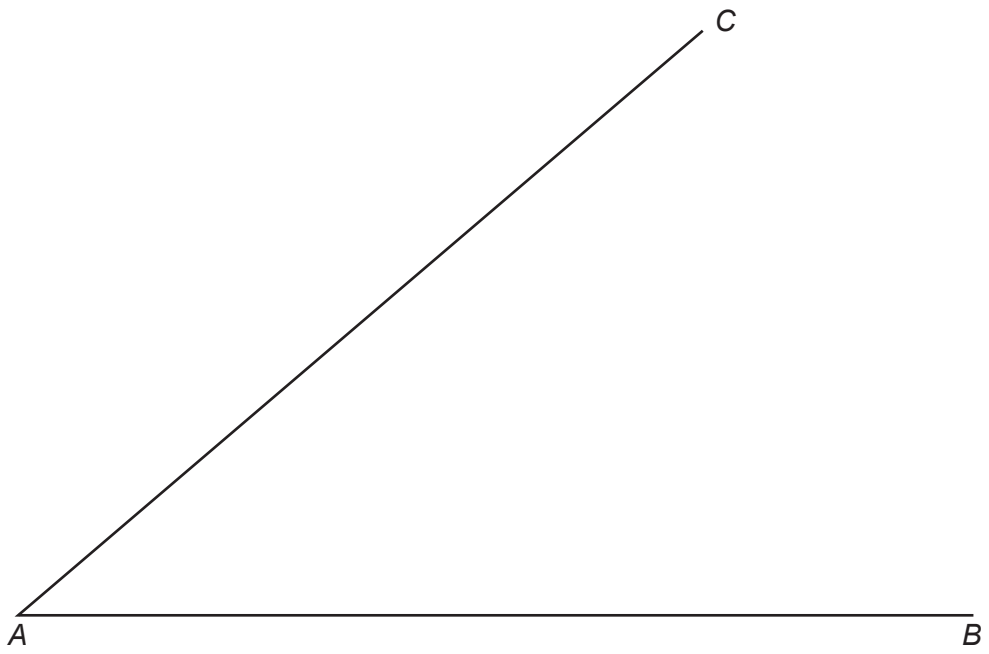


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(b) Using a ruler and a pair of compasses, construct the bisector of angle *BAC*. [2]



(c) Using a ruler and a pair of compasses, construct an angle of 60° at the point *A*. [2]

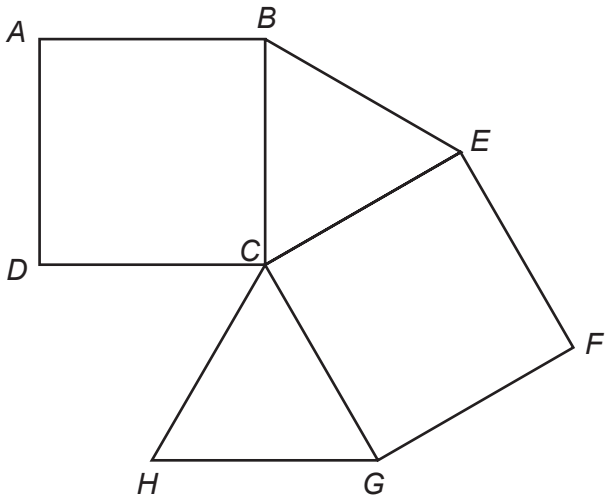


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14. The diagram shows 2 identical squares and 2 identical equilateral triangles.
Explain fully how another equilateral triangle will fit exactly into the gap *DCH*. [5]



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15. Agatha and Bryn each bought some pens.
Each pen Agatha bought cost £2.20.
Each pen Bryn bought cost £1.40.
Altogether, the cost of the pens was £13.
How many pens did they buy altogether? [4]

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16. *(a)* In Newterry, the mean daily rainfall for the first week in April was 3·8 cm.
Comparing this first week with the following week, it rained:

- 1 cm more on Sunday, Monday and Tuesday of the second week than on these days during the first week,
- 1 cm less on Wednesday, Thursday and Friday of the second week than on these days during the first week,
- the same amount on the Saturday of the second week as on the Saturday of the first week.

What was the mean daily rainfall in the second week?
Give a reason for your answer. [2]

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(b) In Summerfield, the rainfall for each of 30 days was measured. The results are summarised in the table below.

Daily rainfall, r, in cm	Number of days
$0{\cdot}5 \leqslant r < 1{\cdot}5$	5
$1{\cdot}5 \leqslant r < 2{\cdot}5$	11
$2{\cdot}5 \leqslant r < 3{\cdot}5$	13
$3{\cdot}5 \leqslant r < 4{\cdot}5$	1

(i) Calculate an estimate for the mean daily rainfall for the 30 days. [4]

.....

.....

.....

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.....

(ii) State the modal class. [1]

Modal class .....

(iii) Write down the class in which the median lies. [1]

Median class .....

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17. *(a)* An internet company, offering money exchange, displays a conversion exchange table as shown below.

		Exchange from				
		US dollars 1$	GB pounds £1	Canadian dollars 1$	euros 1€	Australian dollars 1$
Exchange to	US dollars	1	1.59003	0.967202	1.4304	0.916279
	GB pounds	0.628915	1	0.608287	0.8996	0.576261
	Canadian dollars	1.03391	1.64395	1	1.4789	0.94735
	euros	0.699105	1.1116	0.676175	1	0.640575
	Australian dollars	1.09137	1.73532	1.05557	1.56109	1

The method of using this table of exchanges is as follows:

To exchange GB pounds to euros, read down the table, £1 is 1.1116 euros.

Using the exchange rates from the table, calculate the following.

(i) Exchange 200 US dollars to Australian dollars. [2]

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(ii) How many Canadian dollars were exchanged to give 250 euros? [2]

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(b) Fill in the **two** gaps, indicated with dotted lines, in the following conversion exchange table. [3]

		Exchange from		
		Hong Kong dollar 1$	Japanese yen 1 yen	euro 1€
Exchange to	Hong Kong dollar	1		.....
	Japanese yen		1	133·5
	euro	0·090147	.....	1

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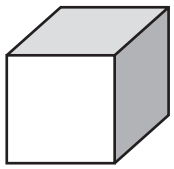
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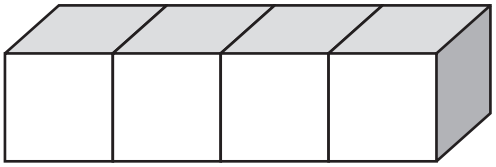
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18. The total surface area of one cube is 54 cm^2.



Four of these cubes are joined together to make a cuboid as shown in the diagram below.



(a) Calculate the total surface area of the cuboid shown in the diagram. [4]

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(b) Calculate the volume of the cuboid shown in the diagram. [3]

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GCSE MARKING SCHEME

MATHEMATICS - LINEAR

NOVEMBER 2013

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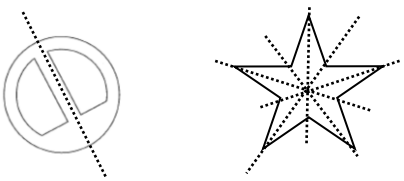
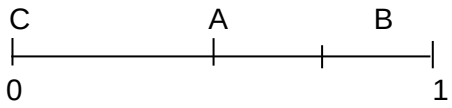
INTRODUCTION

The marking schemes which follow were those used by WJEC for the November 2013 examination in GCSE Mathematics - Linear. 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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PAPER 2 (Calculator allowed) **Foundation Tier**	**Marks**	**FINAL MARK SCHEME** **Comments**
1. (a) (59.96) 32.7(0) (socks) 55.38 (shirts) 65.36 (shoes) (£) 213.4(0) (b) 10% = 21.34 5% = 10.67 OR (0).05 × 213.4(0) Discount = (£) 10.67	 B1 B1 B1 B1 M1 A1 6	 F.T. their figures for 1 error If cost of shirts is £110.76 then total would be (£)268.78 and discount is (£)13.439 OR (£)13.44 **OR (£)13.43** For any correct method for finding 5% F.T. their total. Allow M1,A1 for (£)202.73 OR **(£)255.34** **Also FT 95% of their total.** **1% = 2.13 then 5% = 10.65 M1 A1 PA-1**
2. Distance 160mm 160cm 160m 160km Weight 35kg 350kg 35mg 35g Capacity 35 litres 350litres 350 ml 35 mm^3 Height 1900cm 190cm 19cm 190mm	 B1 B1 B1 B1 4	
3. (a) Evidence of square counting 59 – 65 3. (b) 	M1 A1 B1 B1 4	 **Condone square notation, e.g. 60^2, but $60^2 = 3600$ gets A0** Circles: for the 1 correct line and no other Star: for all 5 correct lines
4. (a)  (b) likely	 B1 B1 B1 B1 4	 A should be at ½. Condone use of W(hite) B should be between ¾ and 1 exclusive. **(3/4 is to the right of the 'e' in 'red'. Welsh scripts: To the right of the final 'o' in 'stopio')** Condone use of Y(ellow) C should be at 0. Condone use of R(ed) **Letters must be seen on scale (i.e. not 0.5, 0.875 and 0)** **C.A.O.**
5. (a) (i) cylinder (ii) cuboid (b) tangent (c) Perpendicular through C	B1 B1 B1 B1 4	**Accept 'circular based cylinder', 'cylindrical prism', 'cylinder prism', but not 'circular prism'** **Accept 'rectangular cuboid', but not 'rectangular prism'** Tolerance: Between a line to the right of 'B' in AB and a line to left of the 'p' in passes (inclusive) On Welsh script between a line to the right of 'l' in perpendicwlar and a line to left of the 's' in sy'n (inclusive)

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PAPER 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
6. (a) (£)3.16 (b) (£)9.2(0)	B1 B1	
6. (c) 5 (£)1.28 × 5 (6.40) + (£)27.46 = (£)33.86 **(Change =)** (£)6.14 QWC Look for • Spelling • Clarity of text explanations • The use of notation – watch for '=','£', 'p' being used appropriately. QWC2: Candidates will be expected to • present work clearly, with words explaining their processes 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 their processes or steps OR make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	B1 M2 A1 A1 QWC 2 9	M1 for 27.46 +..... OR 1.28 × 5 + ... F.T. (£)32.58 from (£)1.28 × 4 (5.12) + (£)27.46 FT provided M1 awarded Penalise –1 for consistent use of incorrect column. **UK and Europe: (£)13.82 + 5×60(p) (16.82) (£)23.18** **World Zone 1 : (£)26.28 + 5×1.22 (32.38) ((£)7.62** 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 weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling
7. (a) 101 (b) 2×60 + 1 OR **60+61** = 121 (c) (81 – 1)/2 = 40	B1 M1 A1 M1 A1 5	 **C.A.O. 40+41; 40,41; 40 unshaded get M1, A0.**
8. (a) (i) Add 12 to the previous term (ii) Multiply the previous term by –3 (b) F = 6(12) + 10(3) OR 72 + 30 = 102 (c) (i) 8m (ii) (£) 8m/100 OR (£)(0).08m	B1 B1 M1 A1 B1 B1 6	Accept +12, **goes up in 12s, but 12n–8 is B0** Accept ×–3. **Multiply by 3 and alternate (or change) sign gets B1.** For correct substitution **and correct interpretation** C.A.O. Accept 8×m, m×8, m8 F.T. 'their (c)(i) **if algebraic** **Penalise –1 once for use of different letter but allow M** **Use of the letter p gets B0 every time.**
9. (a) Sum of the numbers (476) Sum/8 59·5**(0)** I.S.W. (b) 27 (c) 45 45 55 59 65 66 69 72 Median = 62	M1 M1 A1 B1 M1 A1 6	For attempt to add the numbers For dividing a number in the range 400 – 550 by 8. C.A.O. **–27 gets B0.** For identifying the correct TWO middle numbers OR for arranging the 8 numbers in ascending or descending order. C.A.O. Unsupported 62 gets M1, A1.

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PAPER 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
10. (a) 114 (miles) (b) 64 (miles) (c) 42 (minutes) (d) Line drawn from end of stopping to (13:39, 0)	B1 B1 B1 B1 4	 F.T. 'their 114' – 50 Three 2mm squares beyond 13:30 on the time axis. **(Accuracy of ½ small square)**
11. (a) $\frac{95}{250}\times 100$ 38 (%) (b) ((£) 163.60 – (£) 35.60) = (£) 128 Number of extra days = **'their(£)128'**/(£)16 = 8 Total number of days = 10	M1 A1 B1 M1 A1 B1 6	 **For the (£)128** F.T. except for (£)163.60/(£)16 Unsupported 10 gets all 4 marks. F.T. number of extra days + 2 **Answers like '2 days and a further 8 days' get B0** **Subtracting two lots of £35.60 gets B0 for first B mark. But can then get M1,A1 on correct F.T. even if their answer is not a whole number. In such cases the final B1 is only awarded if their number of days is rounded up to the next whole number.** **Watch out for 163.60/16 = 10.2 = 10 (days) which gets 0.**
12. Either He spends (£)100 on rent and (£)160 on food leaving (£)140 **F.T. for second M1,A1** Frac. remaining 140/400 7/20 **I.S.W.** OR ¼ + 2/5 = 13/20 **F.T. for second M1,A1** Frac. remaining = 1– 13/20 =7/20 **I.S.W.**	M1 A1 M1 A1 4	**Subtracting at each stage :** **Spends (£)100 on rent** **Leaving £300. 2/5 of £300 = 120 leaving (£)180** **F.T. for second M1,A1** **Frac. remaining 180/400 = 9/20** **Possible 4 marks then –1 if any A marks awarded** **Decimals or % equivalents** **.25 + .4(0) = .65.** **1- .65 = .35** **First M1, A1 possible** **F.T. for second M1,A1 but must be fractions for second M1,A1.** **35/100 M1** **= 7/20 A1**
13. (a) $P\hat{Q}R = 48°$ $P\hat{R}Q = 67°$. Completed triangle (b) First arc**(s)** Final arcs and line (c) First arc**(s)** Final arc**(s)** and line	B1 B1 B1 B1 B1 B1 B1 7	**If triangle is 'flipped' then mark as if correct then –1** Provided at least B1 awarded If no arcs then B0, B0 **Arc must be big enough so that the 2nd arc could cut it** **B2 for correct construction at A** **B1 maximum for a correct construction elsewhere on the line.**
14. **Accept angles shown on their diagram** $B\hat{C}E = 60°$ OR $H\hat{C}G = 60°$ $E\hat{C}G = 90°$ OR $D\hat{C}B = 90°$ **Accept the 'box' notation** $D\hat{C}H = 360° – 60° – 60° – 90° – 90°$ = 60° DC = CH **(OR marked as equal on the diagram with $D\hat{C}H$ = 60°)**	B1 B1 M1 A1 E1 5	For at least one correct 60° **(Anywhere in either triangle)** For at least one correct 90° **(Anywhere in either square)** Angles at a point make 360 $D\hat{C}H$ = **60 on its own gets no marks.** **Needs to show having the 60° and DC = CH.**

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PAPER 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
15.(Agatha) 220, 440, 660, (880, 1100, 1320, ...) (p) (Ben) 140, 280, 420, (560, 700, 840, 980 ,…) (p) **4** × 2(.)20 = 8(.)80 AND **3** × 1(.)40 = 4(.)20 (£ or p) 7 (pens) **OR** **3.60, 7.20, 10.80, (14.40 …) + 2.20** **4 + 3** **7** **H1**	M1 M1 A1 A1 **M1M1** **A1** **A1** 4	In £ or p or mixed. M1 for the any 3 correct multiples In £ or p or mixed. M1 for the any 3 correct multiples Identifying the correct number of each CAO. Must state total number of pens altogether *Alternative, Trial & improvement:* *2 trials, correctly evaluated showing **improvement*** *M1* *2 trials, correctly evaluated between £10 & £16 incl.* *M1* *4×2(.)20 and 3×1(.)40 = (£)13* *A1* *7(pens) CAO* *A1* **Award all 4 marks for an unsupported answer of 7 (pens)**
16. (a) 3.8 (cm) or states 'the same' Reason, e.g. 'they even out', 'the mean of these is zero', 'totals are the same each week', 'taking away 3 and adding 3 so it stays the same', 'same amount of rainfall in both weeks' (b)(i) Mid-points 1, 2, 3, 4 1×5 + 2×11 + 3×13 + 4×1 Intention their ∑fx / 30 2.3(33…cm) (ii) Modal class 2.5 ≤ r < 3.5 **(13)** (iii) Median 1.5 ≤ r < 2.5 **H4**	B1 E1 B1 M1 m1 A1 B1 B1 8	Mark final answer. Award independently from E mark Accept a correct method as a reason, e.g. (3.8×7 + 3 – 3)÷7 or equivalent Allow '3.8+3 = 6.8, and 6.8-3 = 3.8', or '4.8×3+2.8×3 + 3.8 = 26.6 with 26.6÷7=3.8 i.e. showing by calculation that +3 and -3 means no change. Allow indication of + 1 -1 bringing 3.8 or 7×3.8 back to original FT their mid points, including bounds, provided they fall within the classes. 5 + 22 + 39 + 4 (= 70) (70/30) Following correct working, however accept unsupported 2.3(3..cm) for all 4 marks. Accept 7/3 or 2⅓ as a final answer Accept '2.5 to 3.5' **(with/without '13')** Accept '1.5 to 2.5' *If neither B1 awarded in (ii) or (iii), then award SC1 for answers of 3 and 2 respectively.*
17. (a)(i) 200 × 1.09137 **OR 200 ÷ 0.916279** 218(.274) (ii) 250× 1.4789 OR 250 ÷ 0.676175 369(.72...) (b) 1 ÷ 133.5 or 1 ÷ 0.090147 **11.09**…… **0.0074**…… **H5**	M1 A1 M1 A1 M1 A1 A1 7	Accept 200×1.09(..) **and same with other calculations** Accept rounded or truncated **Accept unambiguous truncation** Accept rounded or truncated, also accept 370 Sight of either calculation Either answer correctly placed in the table also implies M1 Accept 0.0075. Only allow 0.01 if correct working seen If answers reversed in the table award M1, A0, A1 If 2 correct answers seen in working award M1, A1, A0 If 1 correct answer seen in working award M1, A0, A0 If only 1 answer given misplaced in table award M1, A0, A0
18. (a) 6 × … = 54 or 54 ÷ 6 = … (Area each face on small cube =) 9(cm^2) 18 (small faces on cuboid) (18 × 9 =) 162(cm^2) (b) (Length side of small cube =) √9 (= 3) Volume = **(4 ×)** 3 × 3 × 3 108 (cm^3) **H8**	M1 A1 B1 B1 M1 m1 A1 7	ISW. Watch for an embedded answer. FT 'their 54÷6' × 'their 18' evaluated correctly from a consistent misconception of the number of faces. ***Alternative:*** *Single cube has 6 faces* *B1* *Cuboid has 18 faces* *B1* *Total surface area 3 × 54* *M1* *= 162 (cm^2)* *A1* ***OR*** *6 hidden faces* *B1* *Equivalent to 3 cubes at 6 faces each* *B1* *Total surface area 3 × 54* *M1* *= 162 (cm^2)* *A1* ***OR*** *Area 4 cubes 4×54 = 216* *B1* *6 hidden faces* *B1* *Area of cuboid 216 – 54* *M1* *= 162 (cm^2)* *A1* FT 'their 9' provided M1 awarded in (a) **Method to calculate volume of 1 or 4 cubes. FT 'their 3' provided M1 awarded** **These alternatives are only marked AS COMPLETE SOLUTIONS. You must not award credit for any of the individual lines. For example, *Area 4 cubes 4×54 = 216.* On its own this gets B0. It only gets B1 as a part of a complete solution with all the other lines for that alternative**

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4370/04

MATHEMATICS – LINEAR
PAPER 2
FOUNDATION TIER

A.M. MONDAY, 17 June 2013

$1\frac{3}{4}$ 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 **12**.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	**6**	
2	**4**	
3	**3**	
4	**4**	
5	**5**	
6	**4**	
7	**5**	
8	**7**	
9	**8**	
10	**6**	
11	**6**	
12	**8**	
13	**4**	
14	**12**	
15	**8**	
16	**3**	
17	**7**	
TOTAL MARK		

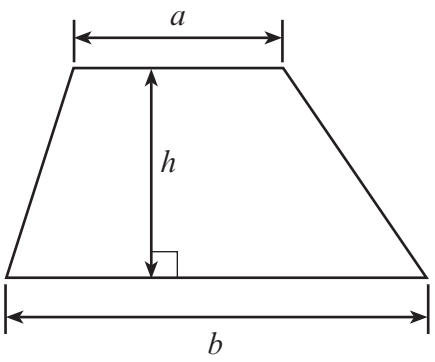
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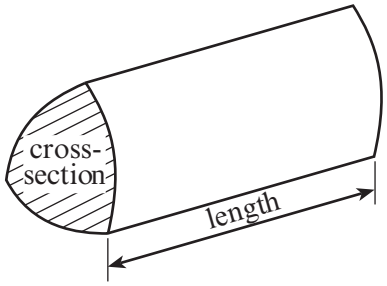
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Formula List

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



Volume of prism = area of cross-section × length



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1. *(a)* Kevin orders some items from a butcher.
Complete the **four** entries in the following table to show his bill for these items.

Amount	Item	Cost (£)
4·5 kg	Beef @ £8.98 per kg	40.41
9 packs	Sausages @ £4.39 per pack	.....
..... packs	Stuffing @ 38p per pack	3.04
12	Steaks @ £6.32 each	.....
Total		.....

[4]

(b) He gets a 20% discount.
How much is this discount?

.....

.....

.....

[2]

2. Circle the quantity that is the appropriate estimate for each of the following.

Length of a football pitch	120 km	120 m	120 mm	120 cm
Weight of a man	80 kg	80 g	80 mg	800 kg
Capacity of a cup	2 litres	10 cm^3	200 ml	1 ml
Area of a page in a book	4 m^2	400 cm^2	40 mm^2	400 cm^3

[4]

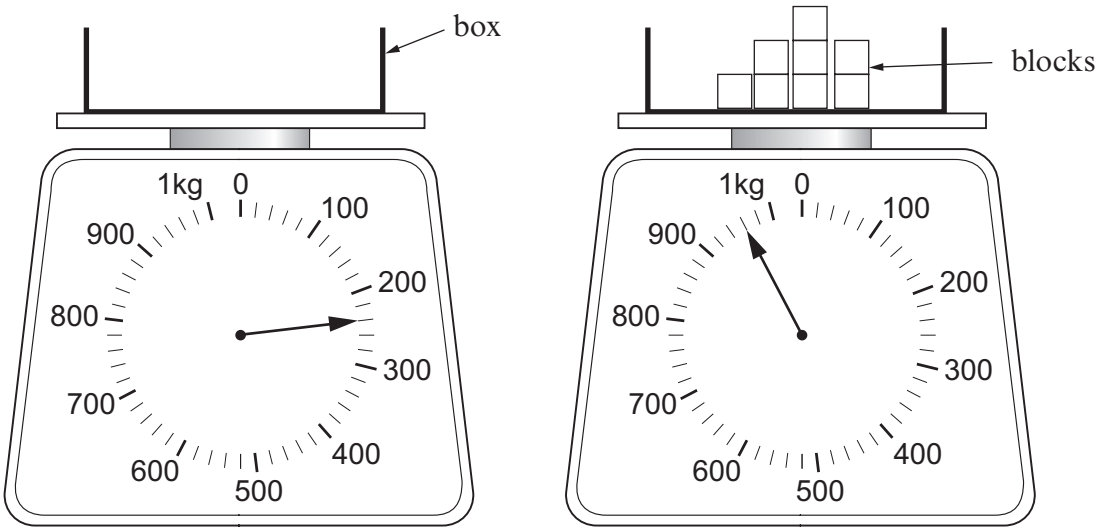
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3. A box is placed on a scale.
8 identical blocks are then placed in the box.



Find how much one block weighs.

.....

.....

.....

.....

.....

.....

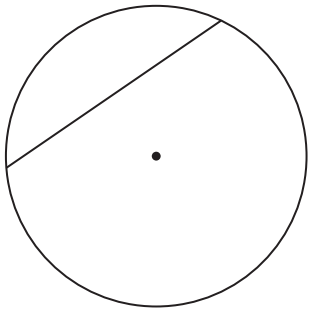
[3]

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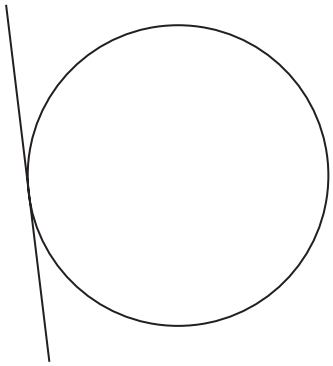
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4. *(a)* Write down the special name of the straight line shown in each of the following diagrams.



.....



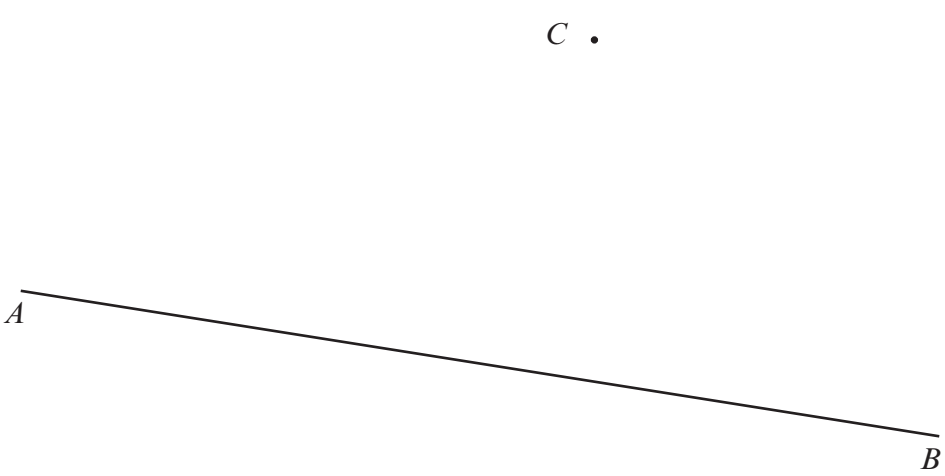
.....

[2]

(b) (i) Measure, in centimetres, the length of the line AB in the diagram below.

Length of AB = ... cm

[1]



(ii) Draw a line perpendicular to AB that passes through C.

[1]

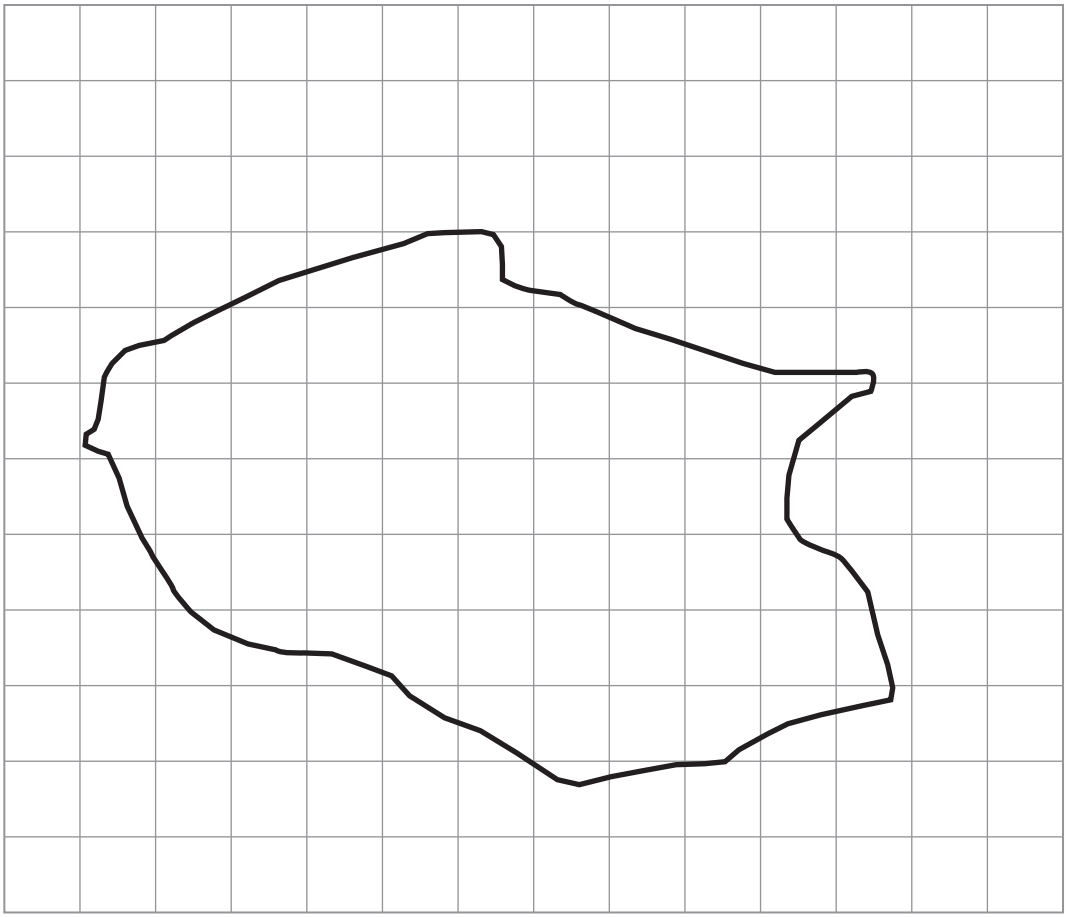
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5. *(a)*



The above shape is the outline of a pond in a park.
It is drawn on a square grid where each square represents 6 m^2.
Estimate the area of the surface of the pond.

.....

.....

.....

.....

Area of the surface of the pond = ... m^2

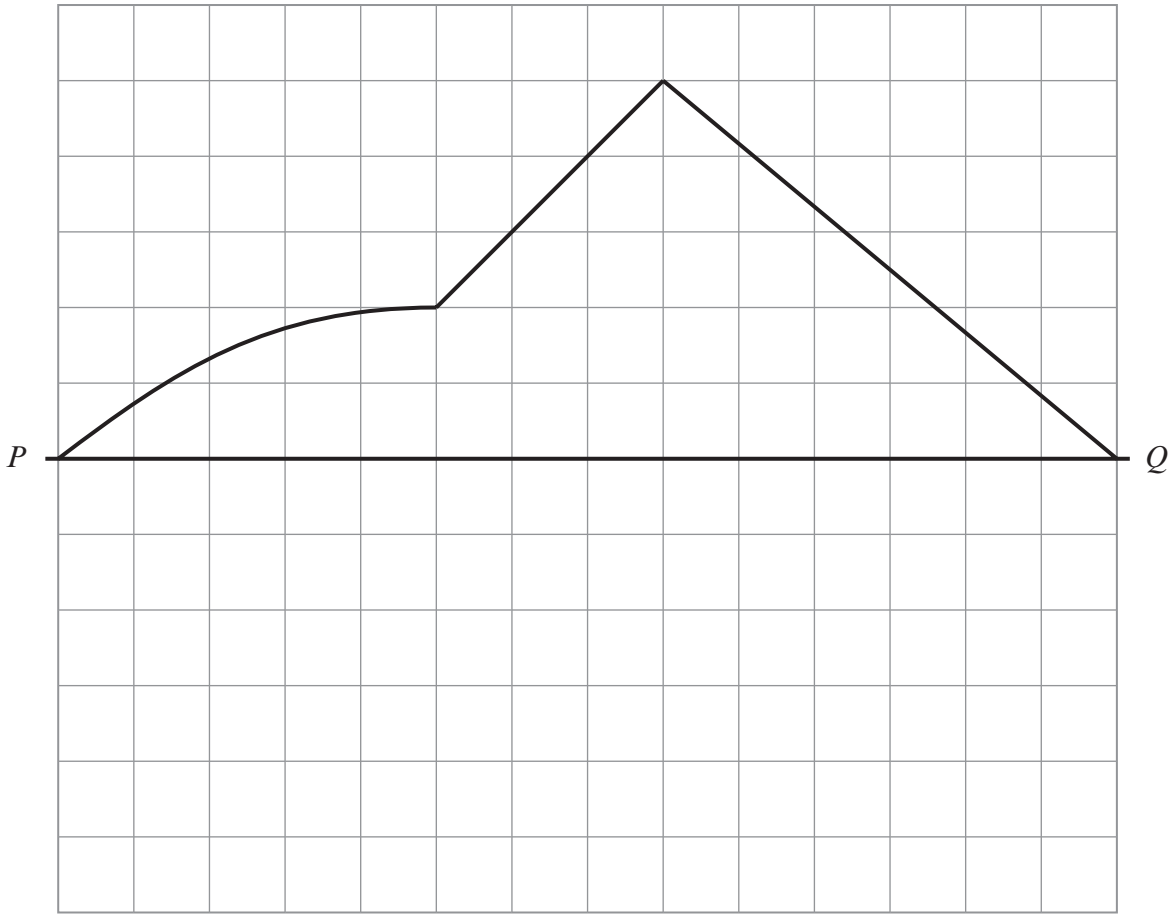
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(b) Complete the following figure so that it is symmetrical about the line *PQ*.



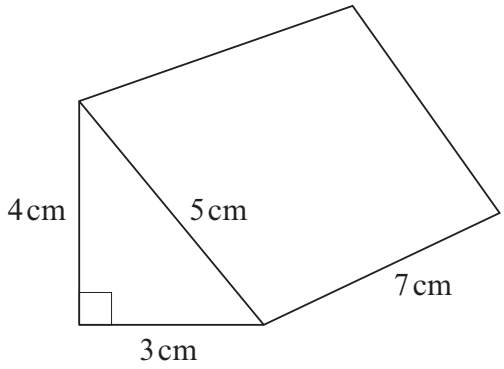
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6. The diagram shows a sketch of a triangular prism.



Draw an **accurate** net of the triangular prism.
The 7 cm by 3 cm face has been drawn for you.

[4]

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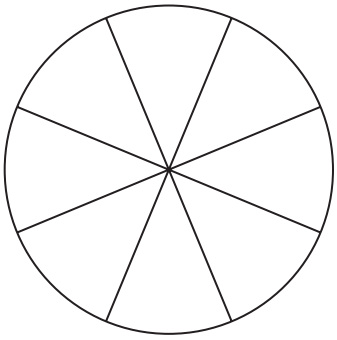
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7. *(a)* Draw a circle around all of the following fractions that are equal to 0·6.

$\frac{12}{20}$ $\frac{1}{6}$ $\frac{9}{15}$ $\frac{6}{10}$ $\frac{5}{20}$

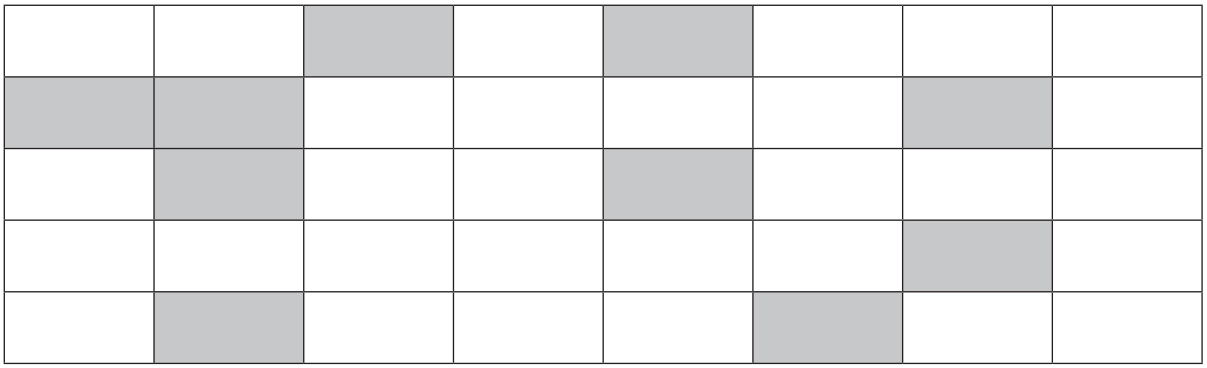
[2]

(b) Shade 75% of the following figure.



[1]

(c) What fraction of the following shape is shaded?
Give your answer in its **simplest form**.



.....

.....

.....

.....

[2]

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8. *(a)* Complete the following table, which shows the temperature at 11:00p.m., the change in temperature and the temperature at 11:00a.m. the next day, in each of three places. The first one has been done for you.

Place	Temperature at 11:00p.m.	Change	Temperature at 11:00a.m. next day
Swansea	−1°C	Up 4°C	3°C
New York	−2°C		0°C
Moscow		Up 5°C	−3°C

[2]

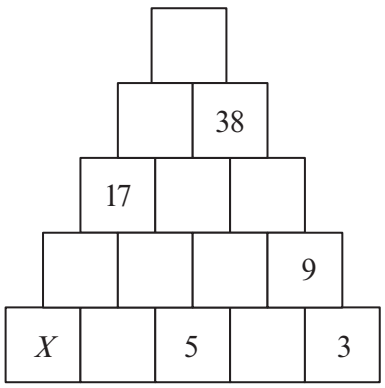
(b) Calculate 53% of 82.

.....

.....

[2]

(c) Each block shown in this tower is to have a number displayed on it.
For each pair of blocks that are next to each other in the same row, the number on the block above them is the total of the numbers on the two blocks.
Some numbers are already displayed.
What number should be written on the box marked X?



.....

.....

.....

[3]

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9. *(a)* Describe **in words** the rule for continuing the following sequences.

(i) 5 9 13 17 21 .....

Rule: .....

.....

[1]

(ii) 243 81 27 9 3 .....

Rule: .....

.....

[1]

(b) (i) A toy costs t pence. Write down, in terms of t, the cost of the toy in £.

.....

.....

[1]

(ii) On June 9th 2012, Beryl was m years old. Write down, in terms of m, her age on June 9th 2002.

.....

.....

[1]

(c) Solve $3x - 7 = 11$.

.....

.....

.....

.....

[2]

(d) There is a connection between the x and y coordinates in the following sequence of points.

(1, 4), (2, 5), (3, 6), (4, 7), ...

(i) Using the same connection, complete the following: (5, ...)

[1]

(ii) Using the same connection, complete the following: (x, ...), giving your answer in terms of x.

[1]

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10. The amount of money (in £) saved by Alan for each of 8 months was as follows:

43 30 75 54 62 46 24 82

(a) Find the range of the amounts saved.

.....

.....

.....

.....

[1]

(b) Find the mean of the amounts saved.

.....

.....

.....

.....

[3]

(c) If Alan had saved £15 less every month, what would be

(i) the mean of the amounts saved,

.....

[1]

(ii) the range of the amounts saved.

.....

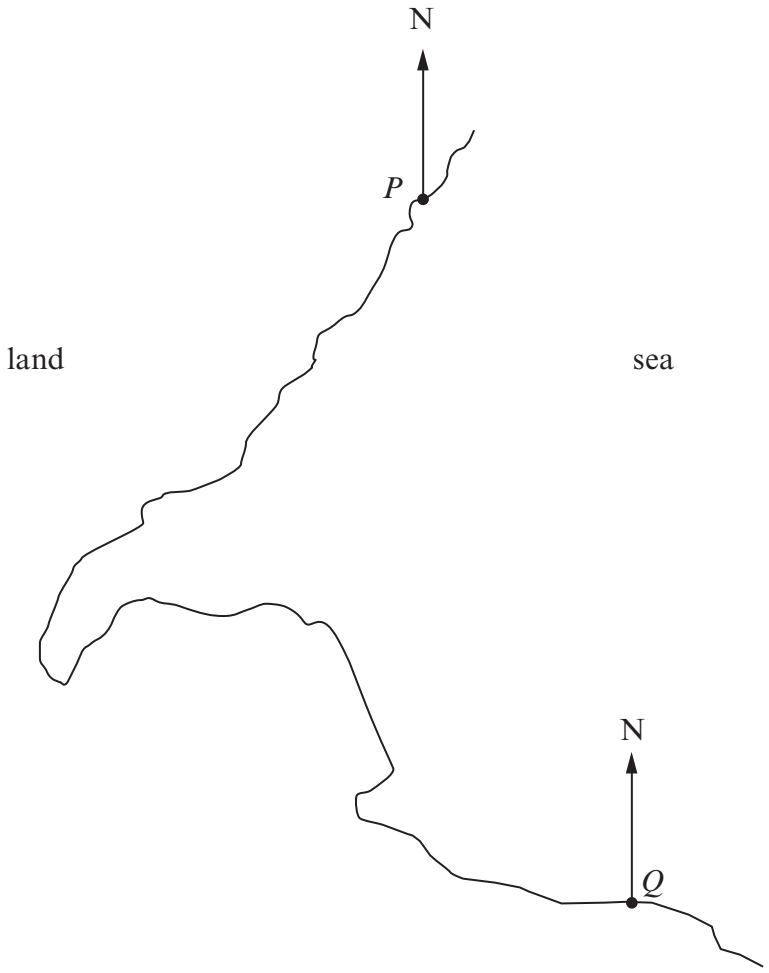
[1]

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11. *(a)* *P* and *Q* are two ports shown on a map with scale 1 cm = 8 km.
Find the straight-line distance, in km, from *P* to *Q*.



.....

.....

.....

.....

[3]

(b) A ship is on a bearing of 147° from *P* and on a bearing of 021° from *Q*.
Plot the position of the ship and mark it *X*.

[3]

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Turn over.

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

In an examination, candidates sit 2 written papers called Paper A and Paper B.
In a forthcoming examination there are 1200 candidates, each sitting Paper A and Paper B.
In 1 day, markers can either mark 60 Paper As or mark only half as many Paper Bs.
The marking must be completed in 10 days.
How many markers are needed to complete the marking in this time?

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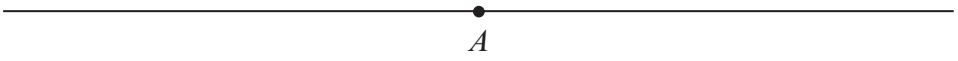
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13. *(a)* Using a ruler and a pair of compasses, construct an angle of 120° at the point A on the line below. [2]



(b) Using a ruler and a pair of compasses, bisect the line PQ. [2]



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14. Miriam is planning a holiday in Pakistan.

(a) Miriam went to an exchange bureau to get some Pakistan rupees for her holiday.



She exchanged £540 for 85 000 Pakistan rupees.
Complete the statement below, giving your answer correct to two decimal places.

.....

.....

.....

'Exchange rate: £1 buys ..... Pakistan rupees'

[3]

(b) Miriam knows that when it is 1p.m. in London it is 6p.m. local time in Karachi, Pakistan.
Miriam is booked onto a flight leaving London on Tuesday at 13:50.
The flight time is 7 hours 51 minutes.

(i) On which day and at what local time should Miriam land in Karachi?

.....

.....

.....

.....

.....

Day ..... Landing time .....

[4]

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(ii) Miriam's flight actually arrived 7 hours 45 minutes after departure.
The aeroplane flying speed between London and Karachi was 434 knots.
Given that 1 knot is 1·85 km/h, calculate the flying distance between London and Karachi.
Give your answer in kilometres.

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.....

.....

[5]

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15. Across the world, temperatures are measured using different units.
All the unit scales are uniform.

Approximate conversions are often used to give a reading in more than one unit in scientific reports.

Use the information given below to complete the tables.

(a)

degrees Celsius	degrees Fahrenheit
20	68
30	86
40	104
50	.....
60	140
70	158

.....

.....

[1]

(b)

kelvin	degrees Celsius
0	.....
100	.....
200	–73·15
300	26·85
400	126·85
500	226·85

.....

.....

[2]

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(c)

kelvin	degrees Celsius	degrees Fahrenheit
340	.....	.....

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.....

[5]

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16. The diagram shows a rectangle $ABCD$.

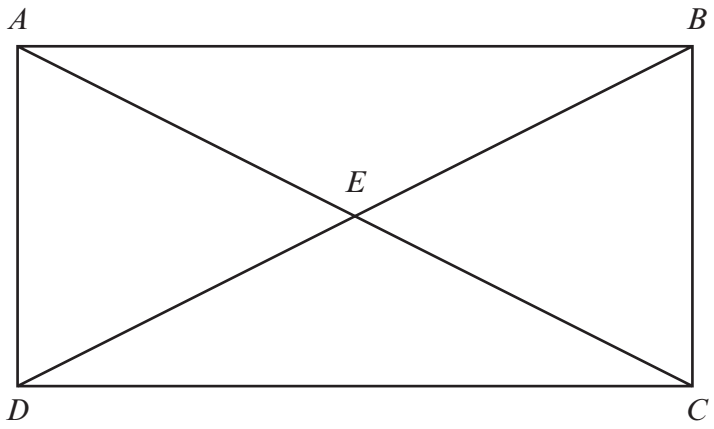


Diagram not drawn to scale

Select 3 **different** pairs of congruent triangles shown in the diagram above and then complete the sentences below for your 3 selections.

Triangle ..... is congruent to triangle .....

Triangle ..... is congruent to triangle .....

Triangle ..... is congruent to triangle .....

[3]

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17. A factory production line packs buttons into bags.
There are exactly 80 buttons packed into each bag.
There is a mixture of different coloured buttons in each bag.
A total of 600 bags of buttons were packed in a day.

The first 100 bags were checked and it was found that a total of 1200 red buttons had been used.
In the 600 bags of buttons it was found that the relative frequency of red buttons packed was 40%.

Calculate the relative frequency of red buttons packed in the final 500 bags.

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[7]

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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 - LINEAR

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 - LINEAR. 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
Paper 1 - Foundation Tier	1
Paper 1 - Higher Tier	5
Paper 2 - Foundation Tier	9
Paper 2 - Higher Tier	12

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2013 Summer Linear Paper 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
1. **Parts (a) & (b) marked at the same time** (a) (40.41) 39.51 (sausages) 8 (packs) (3.04) (stuffing) 75.84 (steaks) 158.8(0) (b) 10% = (£) 15.88 20% = (£) 31.76	 B1 B1 B1 B1 M1 A1	 For the 8 F.T. unless both 39.51 AND 75.84 are incorrect Any correct method for finding 20%. F.T. their total. Ignore extra decimal places in their answer. If (£)31.76 not given then (£) 127.04 gains M1 A1
2. 120km 120m 120mm 120cm 80kg 80g 80mg 800kg 2 litre 10 cm^3 200 ml 1 ml $4m^2$ $400cm^2$ $40mm^2$ $400cm^3$	✓ B1 B1 B1 B1	
3. Readings 960 (g), 240 (g) One block weighs (960 – 240)/8 = 90 (g)	B1 M1 A1	720 implies B1 FT readings
4. (a) chord tangent	B1 B1	
4. (b) (i) 12.1 (cm) to 12.5 (cm) inclusive	B1	
4. (b) (ii) Perpendicular through C	B1	Line should be between a line touching the left of A and between the p and a of 'passes'. Perpendicular does not need to cut AB
5. (a) **(Viewed with diagram)** Evidence of square counting 46 – 52 inclusive 276 – 312 inclusive (m^2)	 M1 A1 B1	 F.T. 'their 46 – 52' × 6 Unsupported answer in the range 276 – 312 gets 3 marks.
5. (b) Both lines Arc	B1 B1	Ignore extra lines that look like wrong attempts F.T. the end of their line and opposite curvature.
6. 7 by 4 rectangle 7 by 5 rectangle Two 3,4, 5 triangles Makes a valid net	B1 B1 B1 B1	Notes: Wrong dimensions gets B0; allow ±2mm Ignore 'flaps'. Must be a correct net that would produce the prism.
7. (a) 12/20, 9/15 and 6/10 circled	B2	B1 for any 2 correct and up to 1 incorrect OR B1 for all 3 correct and 1 incorrect.
7. (b) 6 shaded sectors OR 2 unshaded sectors	B1	
7. (c) 1/4 I.S.W.	B2	B1 for equivalent , e.g. 10/40 Do NOT accept decimals
8. (a) Up 2(°C) –8(°C)	B1 B1	Allow –2(°C) Down
8. (b) 53/100 × 82 = 43.46 I.S.W.	M1 A1	Any correct method for finding 53%. C.A.O. 43.46% gets M1, A0. Unsupported 43, 43.4, 43.5 gets M1, A0
8. (c) 73 35 (38) (17) 18 20 10 7 11 (9) 8 2 (5) 6 (3)	B1 B1 B1	For the 6 and the 11 For any four other correct numbers on F.T. For the 8, C.A.O. X=8 gets 3 marks.

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2013 Summer Linear Paper 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
9. (a) (i) Add 4 to the previous term	B1	Accept +4. B0 for n+4 or 4n+1
9. (a) (ii) Divide the previous term by 3	B1	Accept ÷3. B0 for n/3
9. (b) (i) (£) t/100	B1	Accept t ÷ 100 or (0).01t
9. (b) (ii) m – 10	B1	Allow m = m – 10
9. (c) 3x = 18 (x=) 6	B1 B1	 F.T. 3x=b, if b is a multiple of 3 then answer must be integer Accept embedded answers such as 3×6 – 7 = 11 3×6 = 18 gets 0, but 3x = 18 then 3×6 = 18 gets B2
9. (d) (i) (5, 8) I.S.W. OR (5, 8), (6, 9), (7, 9) , ...	B1	But B0 for (5, 8, 9, ,10, ...)
9. (d) (ii) (x, **x+3**)	B1	B0 for (x,+3)
All parts (a) to (c) marked together 10. (a) (£) 58	 B1	
10. (b) Sum of the amounts (416) Sum/8 (£) 52 10. (c) (i) (£) 37 10. (c) (ii) (£)58	M1 **M1** A1 B1 B1	For attempt to add the numbers For dividing a number in the range 330 – 500 by 8. C.A.O. F.T. 'their mean' – 15 F.T. their range in part (a)
11. (a) 9·7 (cm) 9·7 × 8 = 77·6 (km)	B1 M1 A1	Allow 9·5 – 9·9 FT 'their 9·7' Unsupported answers in the range 76 – 79.2 inclusive get 3 marks.
11. (b) **Use Overlay** Bearing 147º from P Bearing 021º from Q Point (X)	 M1 M1 A1	 Allow ±2° Allow ±2° F.T. if at least M1 awarded Unambiguous dots within the boundaries of the overlay can get the M1s. One unambiguous dot within the 'box' gets all 3 marks. An unambiguous point of intersection does not require X.
12. e.g. Paper A 1200/60 = 20 Paper B 1200/30 = 40 For either 2 markers OR 4 markers. 6 markers needed in total. Look for • spelling • clarity of text explanations, • the use of notation (watch for the use of papers, markers, days 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 M1 A1 B1 B1 QWC 2	 Accept 20 × 60 = 1200 for M1, A1 Accept 40 × 30 = 1200 OR 2×20 for M1, A1 Unsupported answer of '6 (markers)' gets 6 marks. Unsupported 'about 6' OR 'at least 6' gets B0, B0. 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 weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling

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2013 Summer Linear Paper 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
13. (a) Arcs to show 60º or 120º 120º angle drawn with either 60° or 120° labelled correctly	M1 A1	Allow unlabelled angles of 60 as the supplementary angle will be 120. A0 for incorrect labelling of the 60° and/or 120°, or no labelling. Watch out for when either end of the line to A is used as the radius of the arc.
13. (b) Correct intersecting arcs which are above and below the given line. Line bisector	M1 A1	Candidates may draw 2 pairs of correct arcs above the line (or 2 pairs below the line) to get this M1.
14. (a) 85000/540 157.41	M1 A2	 Mark final answer A1 for sight 157(.407407…) not to 2dp as required
14. (b)(i) Wednesday Method, e.g. 13:50 + 5 hours + 7hrs 51 minutes (0)2(:)41 or 2(:)41 am	B1 M1 M1 A1	 Do not penalise poor notation for M marks Award M2 for '+12hr 51mins' Notation for 24 or 12 hour time must be correct Do not accept 241pm The A mark depends on M2, award all marks for a correct answer
14. (b)(ii) (Speed) 434 × 1.85 (802.9 or 803) (Distance) × 7.75 6222(.475 km) or 6223.(25km)	✓ M1 M2 A2	 M1 for '× 7hr 45min' 'or × 465 min' A1 for an answer of 3363.5, OR 6215.5(km) or other similar answers that would be correct apart from premature approximation
15. (a) 122	B1	
15. (b) (0 kelvin) -273.15 and (100 kelvin) -173.15	B2	B1 for either, or 2 negative answers with their 0 kelvin answer being 100 less than their 100 kelvin answer
15.(c) 340 kelvin to Celsius: working with 100 difference in both kelvin and Celsius 66.85 (degrees Celsius) Answer for Fahrenheit <u>between 140 and 158</u> exclusive 6.85 tenths of 18 OR (6.85/10)×18 152(.33 Fahrenheit)	✓ M1 A1 B1 M1 A1	 e.g. sight of 40 + 26.85, 126.85 – 60, 340-273.15 Look for response in the table. Accept 66.8, 66.9, 67 Look for evidence in the table. FT from rounding 66.85 (Celsius), e.g. 7 tenths of 18 Accept 153 from correct working *Allow final B1, M1, A1 for a correct evaluation of 'their 66.85' × 1.8 + 32* Penalise reversed answers - 1
16. Any three different pairs of congruent triangle identified	✓ B3	 B1 for each pair. Watch out for repeats. If letters are used then ignore the order of letters 'Watch out for usage of 4 letters which still make a triangle (eg ABED)'
17. 80 × 600 ×0.4(0) = 19200 19200 – 1200 OR 18000 red buttons ÷ 500 AND ÷80 OR ÷40 000 0.45 or 45%	✓ M2 A1 B1 m2 A1	 M1 for product of any two seen. Or equivalent calculation FT 'their 18000' provided M2 awarded m1 for ÷ 500 or ÷80 Accept 36 buttons per bag as evidence for m1 CAO

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Surname	Centre Number	Candidate Number
Other Names		0

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GCSE

4370/04

MATHEMATICS – LINEAR
PAPER 2
FOUNDATION TIER

A.M. MONDAY, 12 November 2012

$1\frac{3}{4}$ 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 **11***(a)*.

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

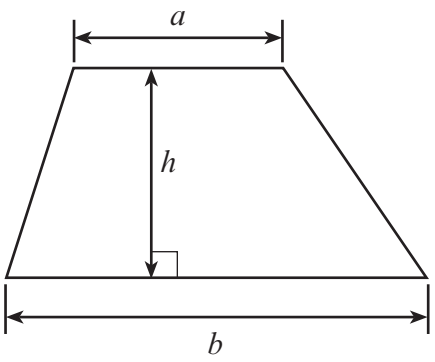
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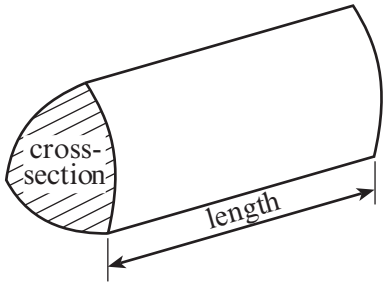
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Formula List

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



Volume of prism = area of cross-section × length



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1. *(a)* A builder is renovating some flats.
He buys a washing machine, 6 tables, 2 sets of chairs and 3 cabinets.
Complete the following table to show his bill for these items.

Item	Cost (£)
1 washing machine @ £242.68	242.68
6 tables @ £24.36 each	
2 sets of chairs @ £43.75 per set	
3 cabinets @ £53.52 each	
Total	

[4]

(b) The builder gets a 10% discount.
How much does the builder have to pay?

.....

.....

.....

[2]

2. **Circle** the quantity that is the appropriate estimate for each of the following.

Weight of a woman	50 g	500 kg	50 mg	50 kg
Volume of a glass of water	27 litres	270 ml	2·7 cm^3	270 litres
Height of a man	180 cm	18 m	180 mm	1800 cm
Distance from Calais to Paris	266 mm	266 cm	266 m	266 km

[4]

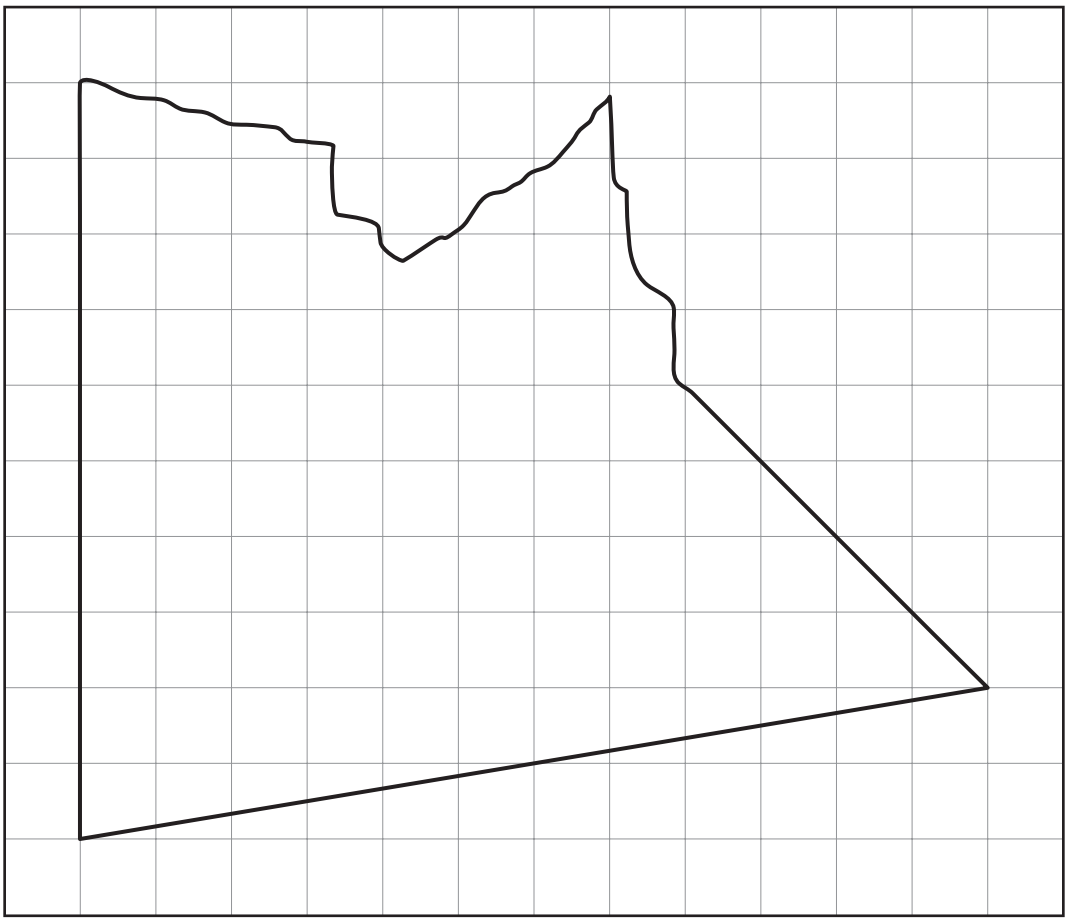
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3. *(a)*



The above shape has been drawn on a centimetre squared grid.
Estimate the area of the above shape.

.....

.....

.....

.....

Area of the shape = ... cm^2

[2]

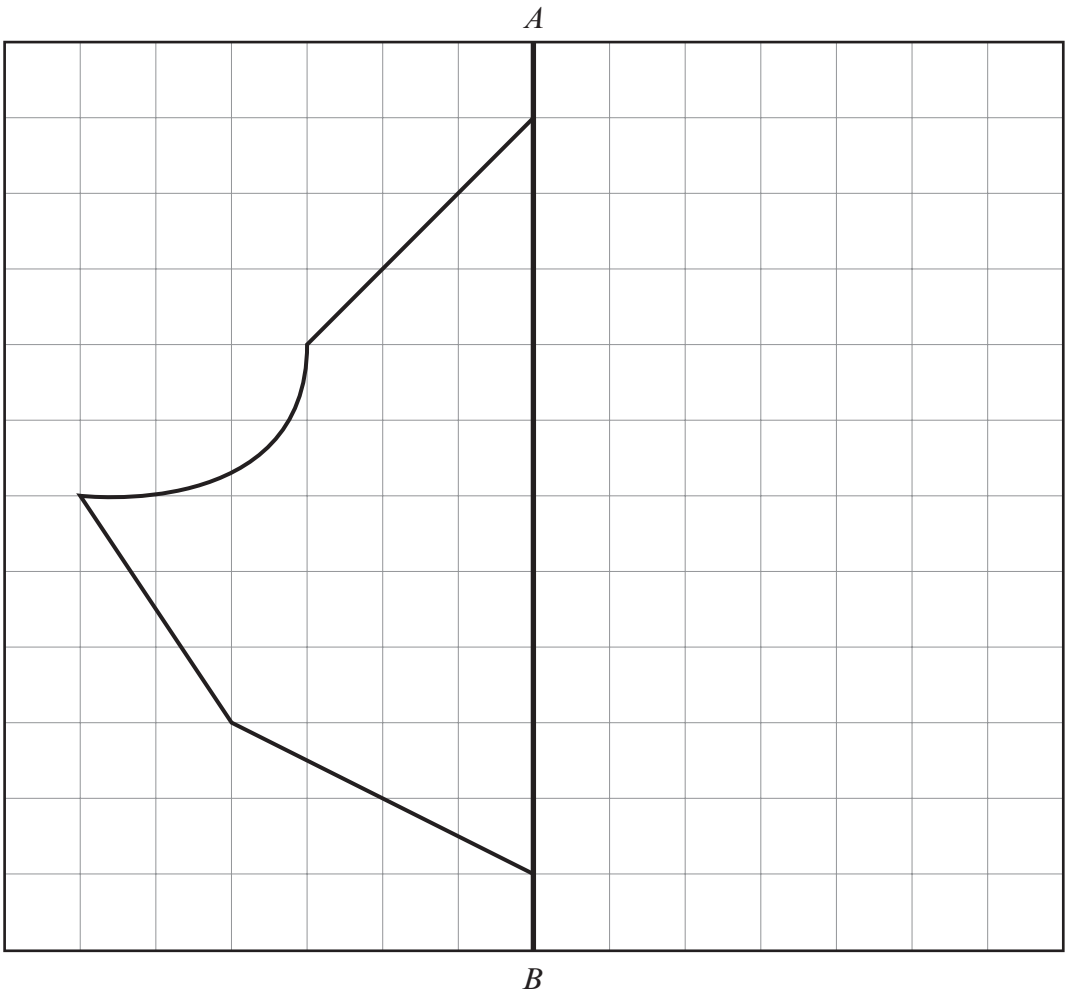
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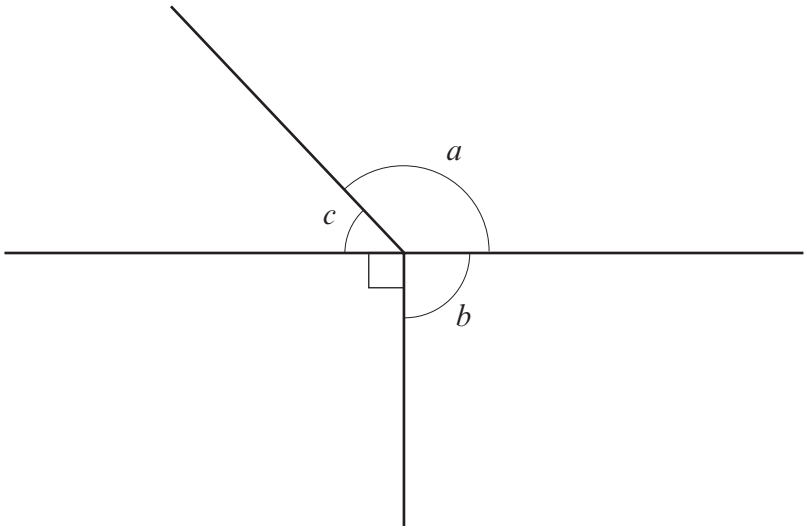
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(b) Complete the following figure so that it is symmetrical about the line AB.

[2]



(c) Look at the angles a, b and c.
Write the letter of the angle alongside its special name.



acute angle ..... obtuse angle ..... right angle .....

[3]

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4. Forty pupils were asked to choose which of the seasons they preferred.
The results are shown below, using the codes:

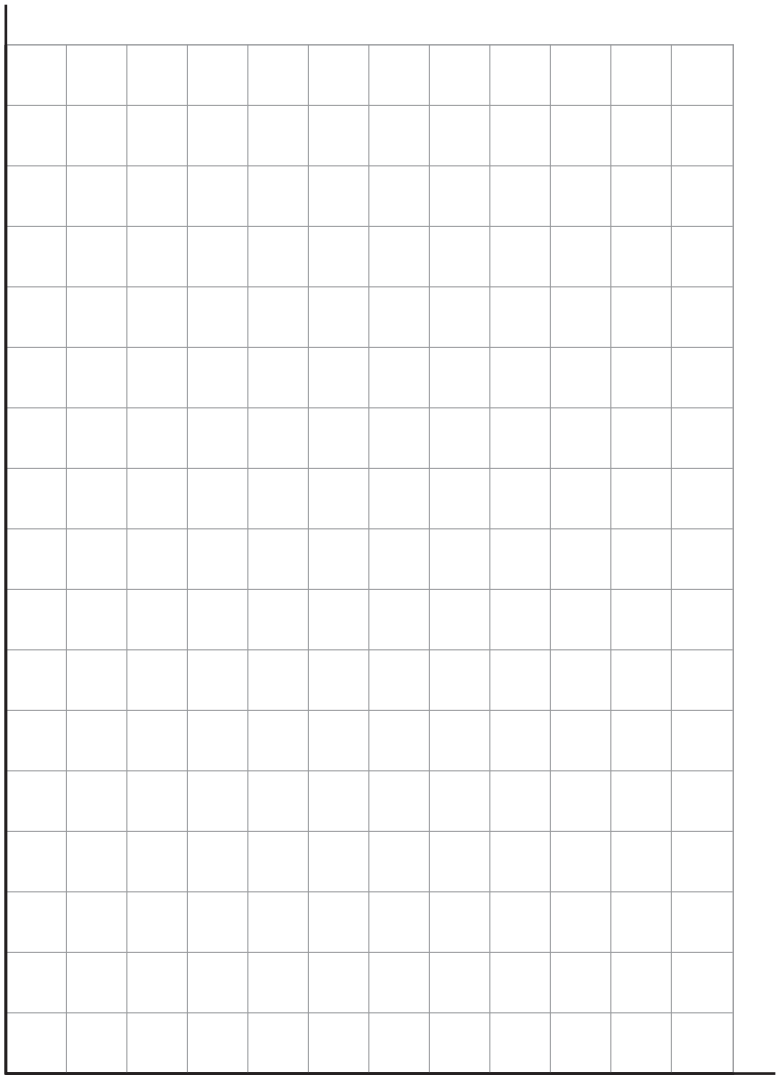
Spring (S) Summer (U) Autumn (A) Winter (W)

S	W	U	U	S	A	U	W	U	S
A	U	W	S	U	A	S	A	U	U
U	S	A	U	A	S	W	U	A	W
W	U	S	W	U	U	S	A	S	U

(a) Using the centimetre squared grid on the opposite page, draw a bar chart for the data given.

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[6]

(b) Write down the mode.

.....

[1]

(c) Using these results, write down an estimate for the probability that a randomly chosen child prefers winter.

.....

.....

.....

[2]

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5. *(a)* Kevin has 10 coloured balls.
Some are yellow (Y), some are green (G) and some are pink (P).

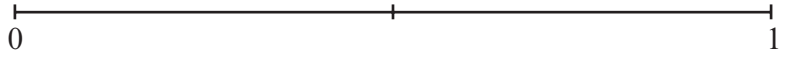


He puts the 10 balls, shown above, into a bag, and then picks one ball at random from the bag.
On the probability scale shown below, mark the points **A**, **B** and **C** where

A is the probability that Kevin picks a pink ball.

B is the probability that Kevin does NOT pick a black ball.

C is the probability that Kevin picks a green ball.



[3]

(b) **Circle** the best expression from those given below to describe the chance of the event **A** occurring.

impossible **unlikely** **an even chance** **likely** **certain**

[1]

6. Each row of the following table needs to show equivalent fractions, decimals and percentages.
The first row has been done for you.
Complete the rest of the table.

Fraction	Decimal	Percentage
$\frac{1}{2}$	0·5	50%
$\frac{1}{4}$		25%
	0·6	
	0·75	75%

[4]

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7. Gareth has tiles which are shaped like isosceles triangles.
For each tile, the side of the tile that is not equal to either of the other 2 sides has glue on it.
The glued side of each tile is the same length.

(a) Gareth takes two **identical** isosceles triangular shaped tiles.
Gareth sticks the two glued sides together so that the two tiles make a quadrilateral shape.

What is the special name of the quadrilateral that Gareth has made?
Draw a sketch to show this.

Name of quadrilateral .....

[2]

(b) Gareth now takes two **different** isosceles triangular shaped tiles.
These tiles are **not** identical but their glued sides are of the same length.
Gareth sticks the two glued sides together so that the two tiles make a quadrilateral shape.

What is the special name of the quadrilateral that Gareth has made?
Draw a sketch to show this.

Name of quadrilateral .....

[2]

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8. *(a)* Describe **in words** a rule for continuing each of the following sequences.

(i) 82, 75, 68, 61, 54, ...

Rule: .....

.....

[1]

(ii) 2, –4, 8, –16, 32, ...

Rule: .....

.....

[1]

(b) (i) A sweet weighs w grams. Write down, in terms of w, the weight of 10 sweets.

.....

[1]

(ii) A boy is 6 years older than his brother. One of the boys is x years old. Write down, in terms of x, the 2 possible ages of his brother.

.....

.....

[1]

(c) Calculate $\frac{4}{9}$ of 45.

.....

.....

[2]

(d) Given that $5W = 2P + 3R$, find the value of P when $W = 4$ and $R = -4$.

.....

.....

.....

.....

.....

[3]

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(e) Solve $4x + 3 = 21$.

.....

.....

.....

[2]

9. Toby went on holiday to China.

(a) He changed £700 into Chinese yuan (CNY) when the exchange rate was £1 = 9.79 CNY.
How many Chinese yuan (CNY) did he receive?

.....

.....

.....

.....

[2]

(b) Whilst on holiday, he went on a tour which cost 2447.50 yuan.
What was the cost of the tour in pounds?

.....

.....

.....

.....

[2]

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10. Number sequences can be created by choosing a starting number and a step number.
For example, if the starting number is 20 and the step number is 5, then the sequence would be

20	25	30	35	40

(a) Write down the next 3 numbers of a sequence when the starting number is 10 and the step number is 7.

10			

[1]

A sequence can have negative steps.

(b) Write down the next 3 numbers of a sequence when the starting number is 35 and the step number is –4.

35	31			

[1]

(c) A sequence has a starting number of 40 and a step number of 6.
By considering the difference between 100 and 40, explain how you can decide whether or not the sequence will show the number 100 at some stage.

.....

.....

.....

[2]

(d) Two pupils, John and Megan, play a game together.
They each make up a sequence by independently choosing a starting number and a step number. Their choices are in the following table.

Pupil	Starting number	Step number
John	30	9
Megan	40	7

After how many steps will they show the same number at the same time and what is that number?

.....

.....

.....

[2]

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(e) They decide to find out, without writing down the sequences, if they can predict whether or not their sequences will show the same number at the same time, as they did in part *(d)*.
They choose the following starting numbers and step numbers.

Pupil	Starting number	Step number
John	9	12
Megan	53	8

Explain how they can predict whether or not their sequences will show the same number at the same time.

.....

.....

.....

.....

.....

.....

[2]

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

ABC is an equilateral triangle and $BCDE$ is a square.

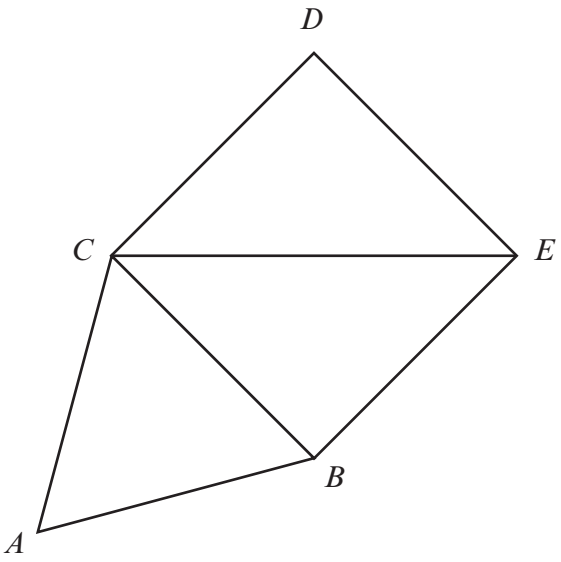


Diagram not drawn to scale

Find the size of $A\hat{C}E$.
You must explain each step of your calculation and show all your working.

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.....

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.....

.....

$A\hat{C}E =$ ..... °

[5]

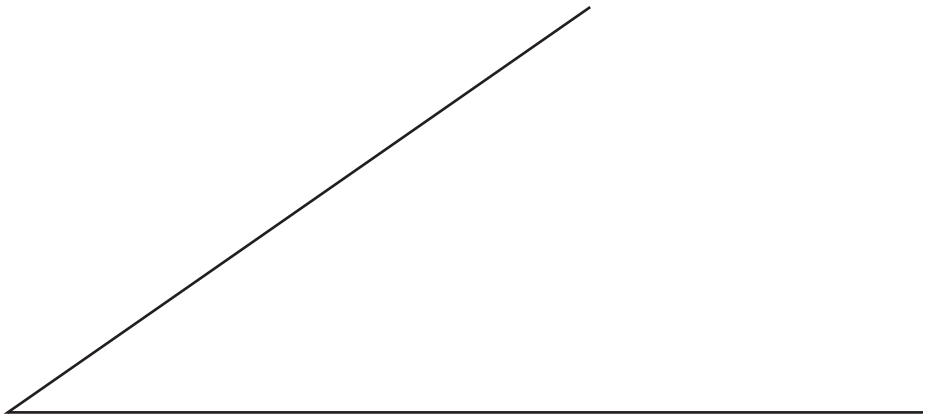
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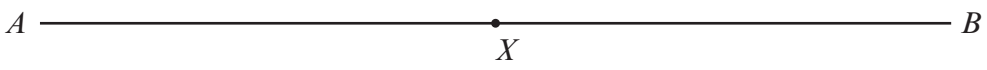
(b) Using a ruler and a pair of compasses, bisect the angle given below.

[2]



(c) Using a ruler and a pair of compasses, construct a perpendicular to the line AB at X.

[2]



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Turn over.

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12. A ship is on a bearing of 215° from Holyhead and on a bearing of 324° from Cardigan. By drawing suitable lines, mark the position of the ship as *C*.

[3]



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13. A solution to the equation

$$x^3 - 7x - 2 = 0$$

lies between 2 and 3.

Find this solution correct to 1 decimal place.

[4]

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14. The table below gives information from the Highway Code on stopping distances for cars.

Speed in mph	**Stopping distance in metres = Thinking distance + Braking distance** (Thinking distance is given first, followed by Braking distance)
20 mph	6 m 6 m
30 mph	9 m 14 m
40 mph	12 m 24 m
50 mph	15 m 38 m

Diagram not drawn to scale

(a) A warning sign for a crossroads is to be placed on a road, which has a speed limit of 30 mph.
Use the data given above to find the minimum distance that the warning sign should be placed from the crossroads.

.....

[1]

(b) An average car is approximately 4 metres in length. How many car lengths is the stopping distance for a car travelling at 40 mph?

.....

.....

.....

.....

[2]

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(c) Complete the table below.

Speed	
mph	km/h
30	.....
50	80
.....	112

.....

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.....

[3]

(d) The stopping distances given in the Highway Code are given assuming good driving conditions and alert drivers.
When a driver is tired, the thinking distance increases by 30% and the braking distance increases by 20%.
Calculate the stopping distance, in metres, for a tired driver travelling at 50 mph in good driving conditions.

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[4]

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15. Mr Jones' electricity quarterly statement from Welsh Energy is shown below.
Some of the entries have been removed.
He pays for his electricity by monthly direct debit payments.
He gets a discount of £27.50 for paying by direct debit.
Use the information given on the statement to complete all of the missing entries and to calculate the balance of Mr Jones' account.

Welsh Energy **Electricity Statement**

Period: 1st July 2012 to 30th September 2012

A Jones
54 Forest View
Swansea

Meter reading last time	Meter reading this time		Units used	Price of each unit **in pence**	Amount £
4267	**4921**	Units used	.....	26.5	.....
		Quarterly charge			30.45
		Total charge			.....
		VAT at 5% of the total charge			.....
		Balance from previous quarter			42.36 **CR**
		Total to pay			.....
		Payments received			
		Direct Debit Discount			27.50 **CR**
		Payment received 18th July 2012			55.00 **CR**
		Payment received 18th August 2012			55.00 **CR**
		Payment received 18th September 2012			55.00 **CR**
		Balance to carry forward to next quarter			.....

Working

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[6]

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16. *(a)*

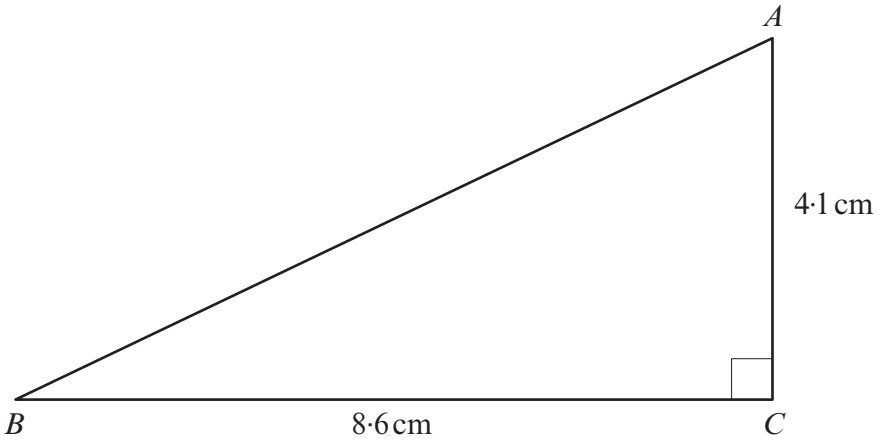


Diagram not drawn to scale

(a) Calculate the area of the triangle ABC.

.....

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.....

.....

[2]

(b) Calculate the perimeter of the triangle ABC, giving your answer correct to 2 significant figures.

.....

.....

.....

.....

.....

.....

.....

.....

[5]

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GCSE MARKING SCHEME

MATHEMATICS - LINEAR

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 - LINEAR. 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.

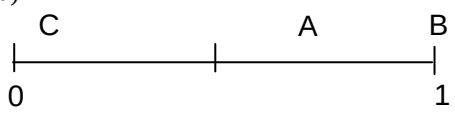
WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

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PAPER 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
1. (a) (242.68) 146.16 (tables) 87.5(0) (chairs) 160.56 (cabinets) (£) 636.9(0) (b) Builder pays (£) 573.21	 B1 B1 B1 B1 B2 6	 F.T. their figures for 1 error F.T. their total rounded or truncated. **Must be in 2 dec. places for the B2** B1 for a correct 10% (£) 63.69. **2 dec. pl. NOT required for B1**
2. 50g 500kg 50mg (50kg) 27 litres (270 ml) 2.7 cm^3 270litres (180cm) 18m 180mm 1800cm 266mm 266cm 266m (266km)	 B1 B1 B1 B1 4	
3. (a) Evidence of square counting 72 – 78 **(inclusive)** 3. (b) Lines Arc 3. (c) c a b	M1 A1 B1 B1 B1 B1 B1 7	 Correct curvature starting and ending at the candidate's 2 lines. **If angle values used then they must be appropriate on the diagram AND in the correct place on the answer line.**
4. (a) Spring (S) 10, Summer (U) 15, Autumn (A) 8, Winter (W) 7 Both axes labelled, e.g. frequency along one axis and Spring (S), Summer (U), Autumn (A), Winter (W) along other axis (or on the bars) Anywhere within the base (inc.) of the corres. bar. and uniform scale for the frequency axis starting at 0 and labelled 'frequency' OR 'number of pupils'. Four bars at correct heights (bars must be of equal width). Can be in any order. (b) Summer OR U (c) 7/40 I.S.W.	B2 B2 B2 B1 B2 9	May be inferred from their bar chart. B1 for any two/three correct frequencies If frequencies score 0, then give B1 for all 4 correct tallies. B1 if no scale, but allow one square to represent 1 OR B1 if not labelled as 'frequency' or similar. If frequency scale starts with 1 at the top of the first square the starting at 0 will be implied for this axis. **Condone frequency numbers alongside square instead of at the top of the squares.** F.T. their frequencies throughout. B1 for any 2 or 3 correct bars on F.T. If no frequencies given in their working, penalise –1 for each incorrect frequency on their bars up to –4 (First and third B2s) Accept 15 and (Summer OR U), but B0 for 15 only B1 for the 7 (in a fraction < 1) OR B1 for a denominator of 'their 40' (in a fraction < 1). **F.T. their frequencies.** Penalise –1 for incorrect notation, e.g. '7 out of 40', '7:40' Allow decimals and percentages including on F.T. For example, (0).175 or 17.5% for 7/40

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PAPER 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
5. (a)  (b) likely	B1 B1 B1 B1 4	A should be between ½ and ¾ **(Accept P for A).** **A should be to the right of the halfway and up to alongside the gap between the a and l in ball (OR between ê and l in pêl in the Welsh version)** B should be at 1. C should be between 0 and ¼ **(Accept G for C).** **C should be to the right of the 0 and up to alongside the y in probability (OR the y in tebygolrwydd in the Welsh version)**
6. (¼) (0).25 (25%) any fraction equiv. to 6/10 (0.6) 60(%) any fraction equiv. to ¾ (0.75) (75%)	B1 B1, B1 B1 4	**ISW for the fractions 6/10 and ¾** **Do not accept fractions like 7.5/10**
All triangles must be 'base' side to 'base' side 7. (a) Rhombus **OR square** Sketch 7. (b) Kite Sketch	 B1 B1 B1 B1 4	 **Mark name first then sketch** B0 for what looks more like a parallelogram than rhombus **Mark name first then sketch**
8. (a) (i) Decrease previous term by 7 (ii) Multiply previous term by −2 8. (b) (i) 10w (ii) x – 6 and x + 6 8. (c) 1/9 × 45 = 5 and 4×5 = 20 8. (d) 5×4 = 2P + 3×−4 2P = 20 + 12 OR 32 P = 16 8. (e) 4x = 18 (x =) 4 ½ OR 4.5	B1 B1 B1 B1 M1 A1 B1 B1 B1 B1 B1 11	Accept −7. **B0 for n – 7** Accept × −2 **B0 for n × –2** **Allow 10×w, w×10 and w10.** Ignore any g(rams) **Ignore w= and =w** For both Any correct method Correct substitution, not awarded until the 2 multiplications are seen to be implemented. **Sight of 20 and –12 gets B1 F.T.** P= 32/2 gets B0. Must be 16 F.T. P = 'their 32'/2. **Allow embedded answers, such as 20 = 2×16 – 12.** **Must be 18 NOT 21–3** (x=) 18/4 gets B0. **(x=) 9/2 gets B0**
9. (a) yuan = 700 × 9.79 = 6853 (yuan) **ISW** 9. (b) Pounds = 2447.5/9.79 = (£) 250 **ISW**	M1 A1 M1 A1 4	Yuan not required but A0 for £6853 £ not required but A0 for 250 yuan

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PAPER 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
10. (a) (10) 17 24 31 (b) (35 31) 27 23 19 (c) **(Yes)** because 100 is 60 away and 60 is divisible by 6 (d) After 5 steps 75 (e) Starting numbers are 44 apart. 44 is divisible by 4	B1 B1 E2 B1 B1 B1 B1 8	 E2 for 6×10 + 40 OR equivalent, **e.g. Yes, in 10 steps (E2)** E1 for considering 60 with an indication of steps of 6 e.g. listing all numbers between 40 to 100. **75 can be answered in lists, but the 5 must be given as an answer.** Allow **B1** for sight of 44 **OR 40 by comparing 21 and 61 after one step etc.** SC1 for only listing the correct sequences.
11. (a) ($A\hat{C}B$) = 60 (°) ($B\hat{C}E$) = 45 (°) ($A\hat{C}E$) = 105 (°) 11. (a) (continued) **QWC** Look for • Spelling • Clarity of text explanations • Some geometrical statements, e.g. angles of a equilateral triangle are 60° QWC2: Candidates will be expected to • present work clearly, with words explaining their processes 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 their processes 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 QWC 2	Look for the angles shown in their diagram (Angles of an equilateral triangle are 60°) (Half the angle of a square is 45°) C.A.O. 105(°) with NO supporting work gets 0. 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 weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling
11. (b) First arcs Final arcs and line 11. (c) First arcs Final arcs and line	 B1 B1 B1 B1 9	**If no pair of compasses used (i.e no arcs) then 0 for their work in (b) and (c)** **They can use the points A and B for this first B1** **Remember the 2 methods discussed in the conference.**
Use Overlay 12. Bearing from Holyhead Bearing from Cardigan Position of Ship	 M1 M1 A1 3	**Use Overlay** Within ±2º. **Watch out for unambiguous 'dots' within** Within ±2º **the boundaries of the overlay and award M1s** **F.T. provided at least M1** **One unambiguous 'dot' within the 'box' on the overlay gets all 3 marks.**

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PAPER 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
13. One correct evaluation (1 dec.pl.) of x^3-7x-2 $2 \leq x \leq 3$ Watch for pupils who are trying to make x^3-7x equal to 2 rather than x^3-7x-2 equal to 0. Two correct evaluations (1 dec.pl.) x^3-7x-2 $2{\cdot}65 \leq x \leq 2{\cdot}85$ which give opposite signs for f(x). Two correct (OR F.T.) evaluations (1 dec.pl.) $2.75 \leq x \leq$ **2.85** which give opposite signs for f(x). Thus solution is 2.8 correct to 1 decimal place. Note that candidates must give a method that proves the solution is 2.8 correct to 1 decimal place. Just stating 0.3520 is closer than −1.217 is NOT enough	B1 B1 M1 A1 4	Calculations should be accurate to 1 decimal place rounded or truncated If no calculations are given accept use of "too low" or "too high" OR >0 and <0. Useful Data 2 -8 2.1 -7.4390 2.2 -6.7520 2.3 -5.9330 2.4 -4.9760 2.5 -3.8750 2.6 -2.6240 2.7 -1.2170 2.8 0.3520 2.9 2.0890 3 4 2.7 -1.217 2.71 -1.067489 2.72 -0.916352 2.73 -0.763583 2.74 -0.609176 2.75 -0.453125 2.76 -0.295424 2.77 -0.136067 2.78 0.024952 2.79 0.187639 2.8 0.352 2.65 -1.9404 2.66 -1.7989 2.67 -1.6558 2.68 -1.5112 2.69 -1.3649 2.8 0.3520 2.81 0.5180 2.82 0.6858 2.83 0.8552 2.84 1.0263 2.85 1.1991
14.(a) 23 (m) (b) (12+24)÷4 9 (car lengths) (c) Speed: mph / km/h *30* / **48** **70** / *112* (d) 15 + 0.30 × 15 OR 38 + 0.20 × 38 or equivalents 19.5 and 45.6 65(.1 m)	B1 M1 A1 M1 A2 M1 A2 A1 10	 Evidence of a method, e.g. ÷5 and ×8, or ×5 and ÷8 as appropriate, or sight of a correct scale, e.g. 80 × 30 /50 A1 for either answer correct. Also implies M1 A1 for either correct answer. Accept 20 and 46 FT from M1, A1 FT from rounding to 'their 20'+ 'their 46 '= 66(m) Unsupported 65 or 66 gain full credit **If no marks, award SC1 for an answer of 12.1 or 12 (giving the increase not the total).**
15. 654 a 173.31 b 203.76 c 10.18(8) d 171.58(8) e 20.91(2) CR **Answers in the bill take precedence over answers on the 'working lines' below it.**	B1 B1 B1 B1 B1 B1 6	Accept truncated or rounded answers F.T. a × 0·265 F.T. b + 30.45 F.T. c × 0·05 **B0 if 105% given here** F.T. c + d – 42.36 F.T. e – 192.50 Allow ±2p If their total cost is < 192.50 then their final balance must show – or CR. If their total cost is > 192.50 then B0.
16. (a) Area = ½ × 8.6 × 4.1 17.6(3 cm^2) (b) (AB^2 =) $8.6^2 + 4.1^2$ OR 73.96 + 16.81 (AB^2 =) 90.77 (AB) = 9.5(273..) (cm) Perimeter = 12.7 + 9.5 = 22.2 (cm) = 22 (cm)	M1 A1 M1 A1 A1 M1 A1 7	 Correct substitution in Pythagoras' Theorem **This work could be seen in (a) and should be credited appropriately.** **FT their 8.6+4.1+ 'their AB if from Pythagoras work'** Given to 2 sig. figs.

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Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4370/04

MATHEMATICS – LINEAR
PAPER 2
FOUNDATION TIER

A.M. WEDNESDAY, 13 June 2012

$1\frac{3}{4}$ 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 **13***(a)*.

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

4370 040001

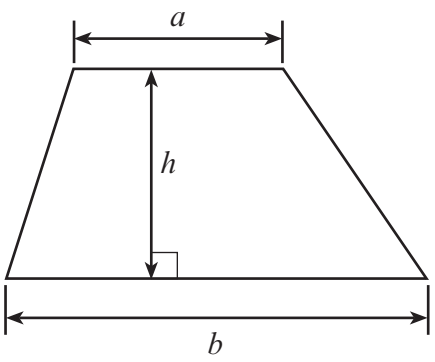
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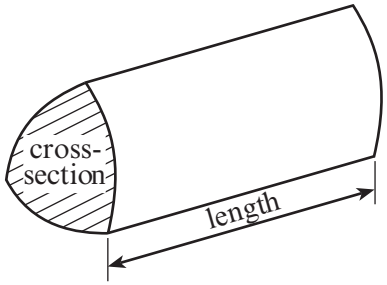
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Formula List

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



Volume of prism = area of cross-section × length



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1. *(a)* Theo orders some clothes from an online catalogue.
He buys 4 pairs of jeans, 5 shirts, 8 packs of socks and 2 pairs of trainers.
Complete the following table to show his bill for these items.

Item	Cost (£)
4 pairs of jeans @ £12.33 per pair	49.32
5 shirts @ £7.62 each	
8 packs of socks @ £3.75 per pack	
2 pairs of trainers @ £25.99 per pair	
Total	

[4]

(b) The site gives a 5% discount.
How much discount does Theo get?

.....

.....

.....

[2]

2. Write down the metric unit **best** used to measure

the length of a hockey pitch, ...

the capacity of a fuel tank of a car, ...

the distance from Paris to Rome, ...

the weight of a large dog. .....

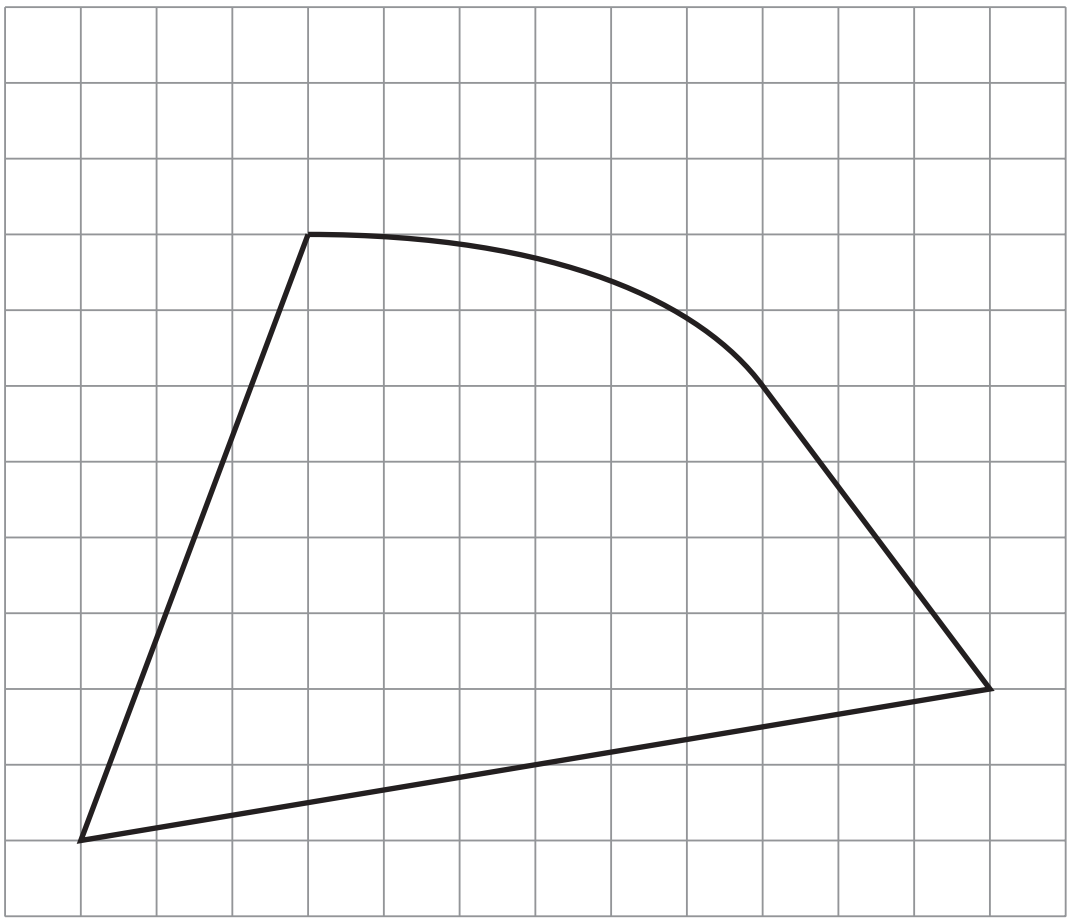
[4]

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3. *(a)*



The above shape has been drawn on a centimetre square grid.
By counting squares, estimate the area of the above shape.

.....

.....

.....

.....

Area of the shape = ... cm^2

[2]

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(b) Complete the following figure so that it is symmetrical about the line *PQ*.

[2]



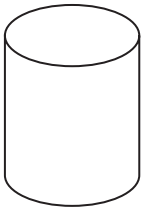
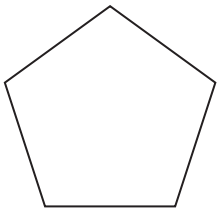
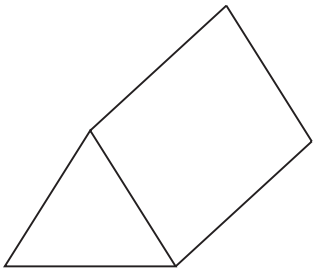
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4. *(a)* Write down the special name of each of the following figures.

[3]

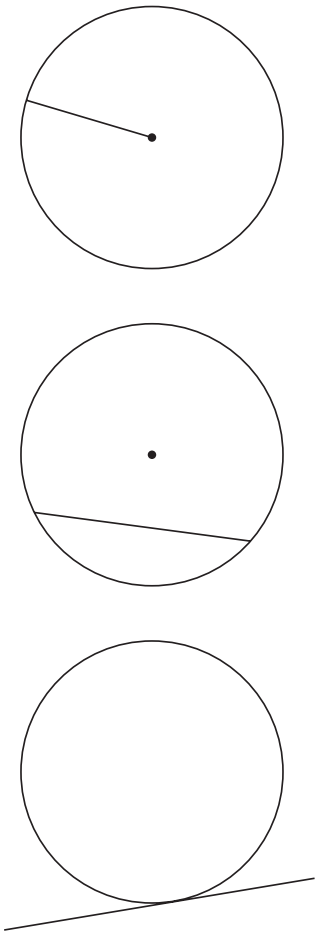
	.....
	.....
	.....

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(b) Write down the special name of the straight line shown in each of the following diagrams. [3]



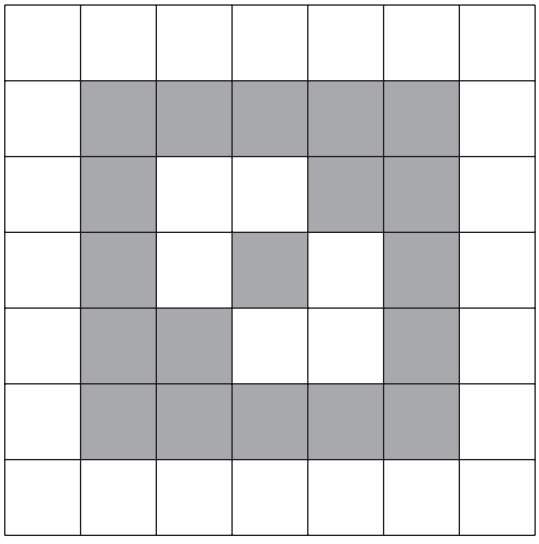
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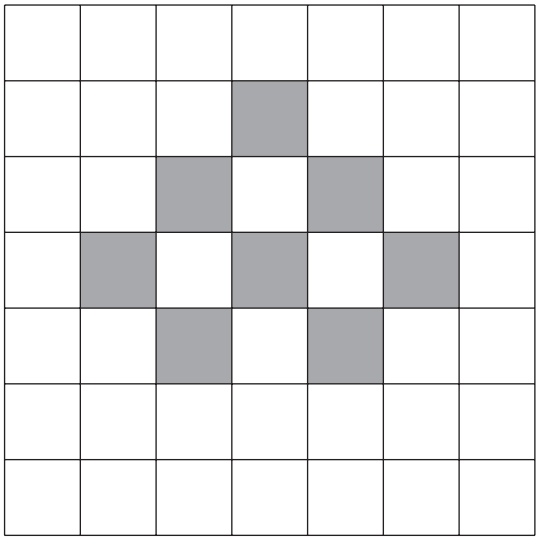
.....

(c) Draw all the lines of symmetry on each of the following patterns. [3]

(i)



(ii)



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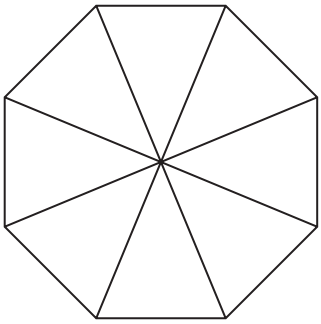
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5. *(a)* Draw a circle around all of the following fractions that are equal to 0·4.

$$\frac{10}{25} \qquad \frac{1}{4} \qquad \frac{4}{15} \qquad \frac{4}{10} \qquad \frac{5}{20}$$

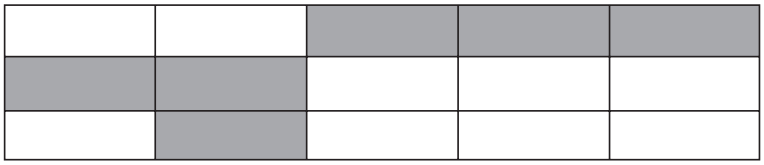
[2]

(b) Shade 25% of the following figure.



[1]

(c) What fraction of the following shape is shaded?
Give your answer in its simplest form.



.....

.....

[2]

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6. *(a)* Dean thinks of a number.
He multiplies his number by 4 and subtracts 12.
The answer he gets is 20.
What number did Dean think of?

.....

.....

.....

.....

[2]

(b) Solve $x - 7 = 4$.

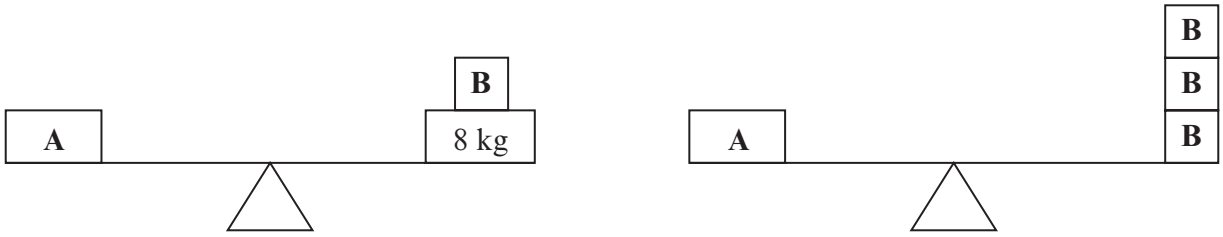
.....

.....

.....

[1]

(c) The packages **A** and **B** balance as shown in the diagrams below.



Find the weight of package **A** and the weight of package **B**.

.....

.....

.....

.....

.....

.....

Weight of package **A** = ...kg Weight of package **B** = ...kg
[4]

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7. *(a)* Describe **in words** the rule for continuing the following sequence.

2, 8, 32, 128, ...

Rule: .....

.....

[1]

(b) The rule connecting T and V is $T = 75 - 6V$.
Find the value of T when $V = 8$.

.....

.....

[2]

(c) (i) Petrol costs £x per litre. Write down, in terms of x, the cost of 45 litres.

.....

[1]

(ii) A car is y years old. Another car is 3 years younger. Write down, in terms of y, the age of the younger car.

.....

[1]

(d) Calculate $\frac{2}{7}$ of 28.

.....

.....

[2]

(e) Wendy earns £1200 in her part-time job. She receives a pay rise of 4%.
How much is the pay rise in pounds?

.....

.....

[2]

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8. The number of points scored by each of eight teams in a quiz was as follows:

80 59 73 45 79 59 35 62

(a) Find the range of the number of points scored.

.....

.....

.....

.....

[1]

(b) Find the mean number of points scored.

.....

.....

.....

.....

[3]

(c) Find the median of the number of points scored.

.....

.....

.....

.....

[2]

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9. Louise and Tim went on holiday to a camp site in France.

(a) They changed £1200 into euros when the exchange rate was £1 = 1.19 euros. How many euros did they receive?

.....

.....

.....

.....

[2]

(b) Whilst on holiday they went on a day's outing which cost 404.60 euros. What was the cost of the outing in pounds?

.....

.....

.....

.....

[2]

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10. The diagram shows six identical circles and six identical squares inside a rectangle $ABCD$.
The diameter of each circle is equal to the length of a side of each square.
Each square has an area of $25\,cm^2$.
Find the perimeter of the rectangle $ABCD$.

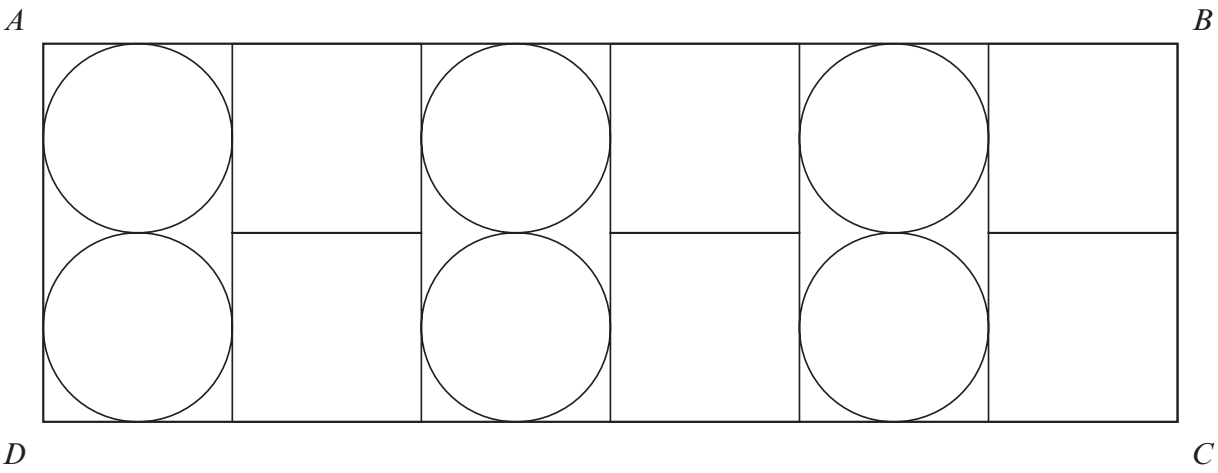


Diagram not drawn to scale

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[4]

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11. *(a)* In an election for a head boy, Andrew received 69 votes, Barry received 30 votes and Kevin received 51 votes.
What percentage of the votes did Andrew receive?

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[2]

(b) The total cost of 6 copies of a magazine and 4 copies of a journal is £29.04.
The magazines cost £3.12 each.
Find the cost of one journal.

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[4]

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12. *(a)* Using a ruler and a pair of compasses, construct an angle of 60° at the point A on the line below.

[2]



(b) Using a ruler and a pair of compasses, construct the perpendicular bisector of the line PQ.

[2]



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(c) Find the size of the angle marked x.

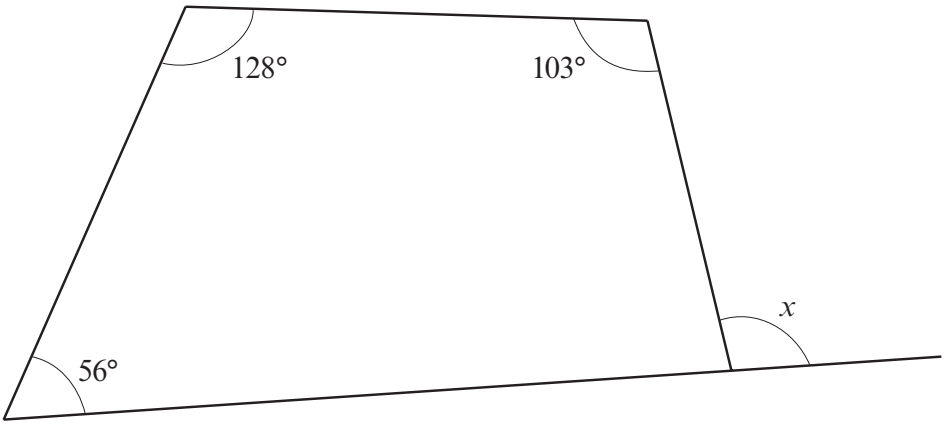


Diagram not drawn to scale

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x = ... °

[3]

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

Valley Water Company measures the water used by a household in cubic metres.
There is a quarterly standing charge of £7.45.
The first 25 cubic metres of water used are charged at a rate of 93 pence per cubic metre.
All further water used is charged at the rate of 132 pence per cubic metre.

Calculate the quarterly water bill for a household using 46 cubic metres of water.

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[6]

(b) A different water company, Trevi Water, has a different scale of charges.

Trevi Water:

- Quarterly standing charge £4
- First 10 cubic metres per quarter at £1.50 per cubic metre
- All further water charged at £2 per cubic metre

Write down, in its simplest form, an expression for the quarterly bill in pounds for a Trevi Water customer who uses x cubic metres of water, where $x > 10$.

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[4]

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(c) Mr and Mrs Alston recycle the water from their bath and washing machine to use in their garden.
Their meter reading, in cubic metres, on 1st April was 1678 and on 30th June it was 1702.
They recycled 8 cubic metres of the water used between 1st April and 30th June.
Find the percentage of the water that they recycled in the quarter.

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[3]

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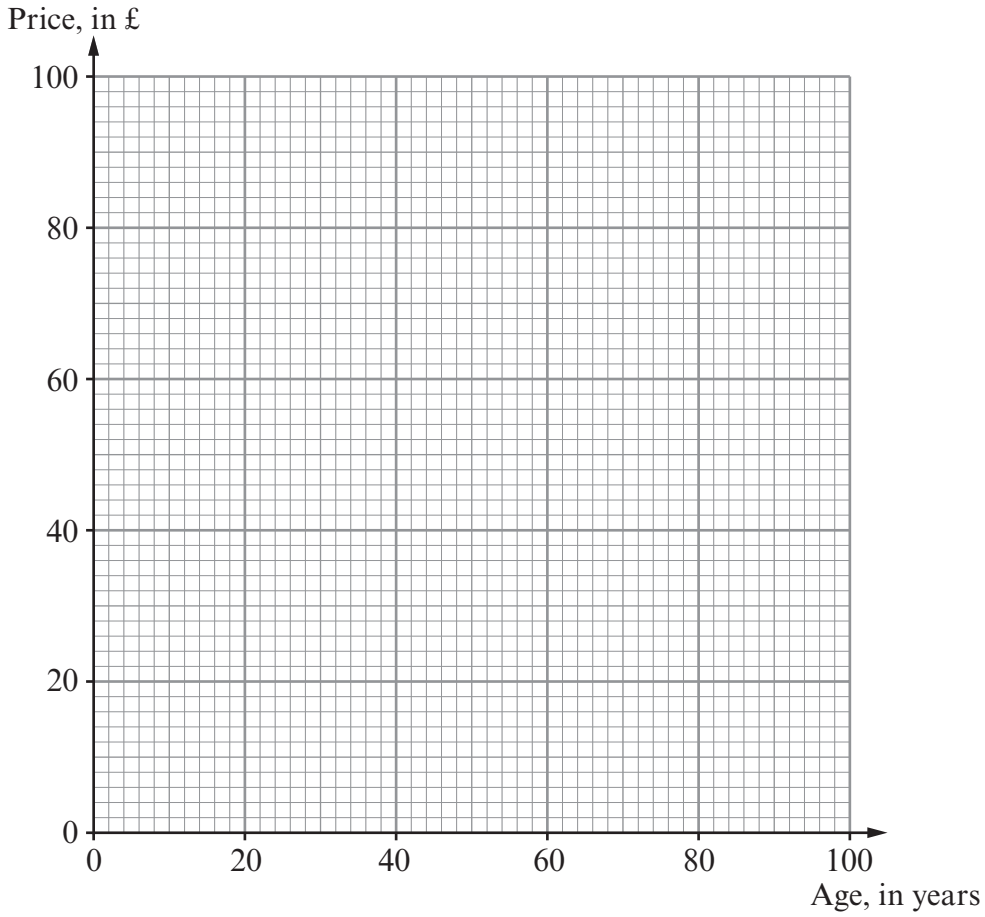
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14. *(a)* The age and price of each of 10 chairs in an antique shop are recorded in the table.

Age, in years	26	40	70	50	46	80	66	64	70	32
Price, in £	100	60	80	70	50	40	20	50	50	30

(i) Draw a scatter diagram to display these ages and prices.

[2]



(ii) Write down the age and price of the oldest chair.

Age ..... years

Price £ .....

[2]

(iii) Does the scatter diagram indicate that there is a correlation between the age and price of the chairs? You must give a reason for your answer.

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[1]

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(b) A leather sofa costs £2400.
Each year, the value of furniture depreciates by 18% of its value at the start of the year.
At the end of two years by how much has the value of the leather sofa depreciated?

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[4]

15.

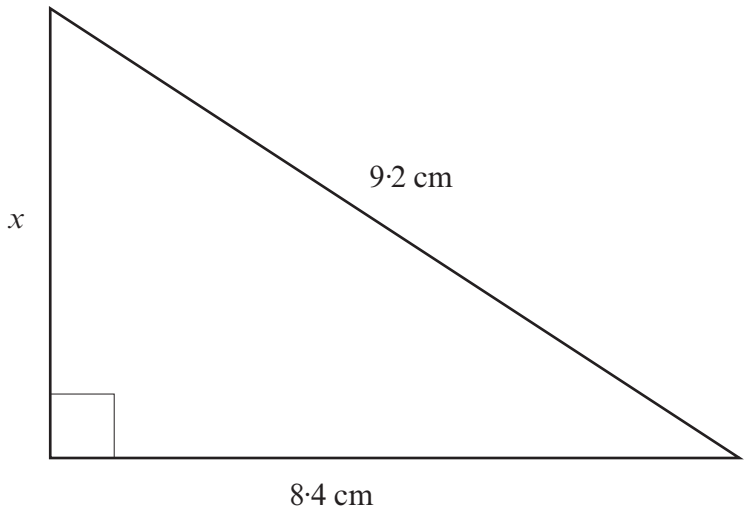


Diagram not drawn to scale

Calculate the length of the side marked x.

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[3]

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16. Concrete blocks in the shape of cuboids are made using cement, sharp sand, gravel and water. A builder's yard offers customers use of their Concrete Quantity Calculator.

Customers enter the length, width and depth of the block of concrete they want to make. The calculator then works out the quantities of cement, sharp sand, gravel and water needed.

One customer enters her measurements, length 0·5 m, width 0·2 m and depth 0·3 m for the concrete she wants to make. This is what the Concrete Quantity Calculator shows:

Concrete Quantity Calculator			
Block dimensions	Length 0·5 metres	Width 0·2 metres	Depth 0·3 metres
	Cement	**10** kg	
	Sharp sand	**18** kg	
	Gravel	**36** kg	
	Water	**5** litres	

Complete the Concrete Quantity Calculator for another customer who wants to make a block of the same type of concrete, measuring 0·6 m by 0·4 m by 0·2 m.

Concrete Quantity Calculator			
Block dimensions	Length 0·6 metres	Width 0·4 metres	Depth 0·2 metres
	Cement	**16** kg	
	Sharp sand	..... kg	
	Gravel	..... kg	
	Water	..... litres	

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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 - LINEAR

SUMMER 2012

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INTRODUCTION

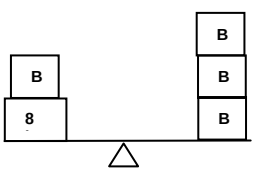
The marking schemes which follow were those used by WJEC for the Summer 2012 examination in GCSE MATHEMATICS - LINEAR. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken 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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P2 (FOUNDATION TIER)

Summer 2012 Paper 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
1. (a) (49.32) (jeans) 38.1(0) (shirts) 30.(00) (socks) 51.98 (trainers) 169.4(0) (b) 10% = (£) 16.94 5% = (£) 8.47 OR 847 (p) I.S.W.	 B1 B1 B1 B1 M1 A1	 Any correct method for finding 5%. F.T. their total (£) 160.93 even unsupported gets this M1, A1
2. metres m litres l kilometres km kilograms kg	B1 B1 B1 B1	 Do NOT accept kilo(s) Do NOT accept kilo(s)
3. (a) Evidence of square counting 53 – 61 inclusive	M1 A1	 Accept numbers in this range even if no evidence of square counting.
3. (b) Lines Arc	B1 B1	For all 3 lines. F.T. their lines, must have opposite curvature.
4. (a) cylinder pentagon (triangular) prism	B1 B1 B1	 square based prism, rectangular based prism get 0 Accept misspellings of 'prism'
4. (b) radius chord tangent	B1 B1 B1	
4. (c) (i) Both lines of symmetry (ii) Line of symmetry	B2 B1	B1 for either one of them and no incorrect lines OR both correct lines and 1 incorrect line. Any extra lines is B0.
5. (a) 10/25 and 4/10 circled	B2	B1 for either one of them and up to 1 incorrect one OR B1 for both correct and 1 incorrect.
5. (b) 2 triangles shaded	B1	
5. (c) 2/5	B2	B1 for 6/15. 6 out of 15 OR 6:15 get B0. 2 out of 5 OR 2:5 get B1. B0 for decimals and/or percentages.
6. (a) 8	B2	B1 for 32 OR 'their 32' ÷ 4 correctly evaluated. Accept embedded answers such as 8 × 4 – 12 = 20 Condone answer of 20 if correct answer of 8 is seen.
6. (b) (x=) 11	B1	Accept embedded answer such as 11 – 7 = 4 11 - 7 = 4 , x = 4 gets B0. 11x also gets B0.
6. (c) By diagrams  B1 B2	 B1 B1 B1 B1	 Two numbers or letters such that A – B = 8 Two numbers or letters such that A = 3B OR left hand diagram OR B+8=B+B+B (worth B1) OR right hand diagram OR B+B = 8 (worth B2) A = 12 (kg) B = 4 (kg)

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Summer 2012 Paper 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
7. (a) Multiply the previous term by 4	B1	Accept ×4
7. (b) (T =) 75 – 6×8 = 27	M1 A1	Correct substitution. 75 – 68 gets M0. C.A.O.
7. (c) (i) (£) 45*x*	B1	Accept 45 × *x* 45x litres gets B0 x = 45 followed by £45x gets B0, because it is 2 or more answers with one being an incorrect answer.
7. (c) (ii) $y - 3$	B1	y – 3 = 3y gets B0
7. (d) 1/7 of 28 = 4 AND 2×4 = 8	M1 A1	Any full correct method. 2/7 × 28 gets M1.
7. (e) 1% of £1200 = (£) 12 AND 12 × 4 4% = (£) 48 I.S.W.	M1 A1	Any correct method Unsupported (£)1248 gets M1, A0
8. (a) 45	B1	
8. (b) Sum of the numbers (492) Sum/8 61·5 I.S.W.	M1 m1 A1	For attempt to add the numbers For dividing a number in the range 410 – 570 by 8. C.A.O. Unsupported 62 gets M0, A0.
8. (c) 35 45 59 59 62 73 79 80 Median = 60·5	M1 A1	For identifying the middle TWO numbers OR for arranging the 8 numbers in ascending or descending order. Must be an even number of numbers. M1 for 6 numbers listed AND the middle two identified. C.A.O.
9. (a) euros = 1200 × 1.19 = 1428 (euros) 9. (b) Pounds = 404.60/1.19 = (£) 340	M1 A1 M1 A1	Units are not required, but incorrect units , e.g. £1428 gets A0 Units are not required, but incorrect units , e.g. 340 euros gets A0
10. Side of square = $\sqrt{25}$ (Diameter of circle = side of square) = 5 (cm) Perimeter of box = 16×5 = 80 (cm)	M1 A1 M1 A1	For finding the '5'. Including on the diagram. F.T. 'their 5'(but not 25)
11. (a) 69/150 × 100 = 46 (%)	M1 A1	M1 for 69/'their150' ×100, if addition clearly seen. C.A.O.
11. (b) Cost of journals = £29.04 – 3·12 × 6 = (£) 10.32 Cost of 1 journal = 10.32/4 = (£) 2.58	M1 A1 M1 A1	 F.T. 'their (£)10.32' but NOT (£)29.04
12. (a) Two appropriate arcs Angle of 60º	M1 A1	Allow construction of 60° at the other end of the line for M1 and A1 Allow ± 2 º
12. (b) Intersecting arcs of equal radii above and below the given line. Line bisector	M1 A1	
12. (c) 360 – 56 – 128 – 103 = 73 (º) x = 107 (º)	M1 A1 B1	Look at diagram. C.A.O. Allow M1, A1 for answer of x=73 F.T. their 73 (º)

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Summer 2012 Paper 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
13. (a) Sight of 21 (units) (Cost of all units =) 25×93 + 21×132 (= 2325 + 2772) = (£)50.97 or 5097(p) (Adding on standing charge 7.45 to give) (£)58.42 or 5842(p) <u>Notes for QWC:</u> QWC2 can only be awarded if the correct unit is shown in the final answer QWC2 requires words throughout the response, not just connected to the final answer Look for • within process and steps, "25 – 46 = 21" is unacceptable • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', £, p being appropriate) QWC2: Candidates will be expected to • present work clearly, with clear process or steps shown AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar QWC1: Candidates will be expected to • present work clearly, with clear process or steps shown • explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar	B1 M1 A1 A1 QWC 2	 FT their '46 – 25'. Place value need not be correct Intention to add may be implied If units are given they need to be correct If units are given they need to be correct. FT from M1, A0, for correct evaluation of adding 7(.)45 to their cost of units with consistent place value SC1 for answer of 68(.)17 or 50(.)23 (working: 46×1(.)32=60(.)72 or 46×(0.)93 = 42(.)78, then add 7.45 leading to 68(.)17 or 50(.)23) OR SC1 for an answer of 30(.)7(0) (working: 25×(0.)93=23(.)25, then add 7.45 leading to 30(.)70) OR SC1 for an answer of 35(.)17 (working: 21×1(.)32=35(.)17 then add 7.45 leading to 35(.)17) <u>N.B. With SC1s, B1 may also be awarded for sight of '21'</u> *Sight of (£)5104.45 comes from mix of units, '5097+7.45' with supported working this is awarded 3 marks 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 weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling
13.(b) 10×1.5(0) (=15) (x -10)×2 4 + 15 + 2x - 20 = (£) 2x - 1	B1 B1 B1 B1	Sight of '19' implies 15, hence B1 With intention of brackets, may be implied later If no marks: Answer of 2x + 9 gets 3 marks Answer of 2x + 5 gets 2 marks Answer of 2x – 5 gets 3 marks Answer of 2x + 19 gets 2 marks Answer of 2x – 16 gets 2 marks
13.(c) 24 (cubic metres) 100 × 8/24 = 33(.3333….%)	B1 M1 A1	Ignore units FT their 24, provided >8. Multiplication must be seen or implied Note: Award B1 only, (M0, A0) for an answer of 1/3 or 0.33…. or equivalent. An unsupported answer of 0.3 award no marks

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Summer 2012 Paper 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
14.(a) (i)All 10 points correctly plotted with no lines (either joining the points or as vertical line graph) 14.(a)(ii) 80 (years) (£)40 14.(a)(iii) Implies "no" with a reason (e.g. 'points scattered', or 'not in line', or 'all over the grid', or 'no relationship between price and age', 'no pattern', random, etc.)	B2 B2 E1	B1 for at least 6 points correctly plotted ignoring any lines drawn. (Tolerance of ½ small square) *Intention for correct points is that they line on grid lines* B1 for each correct response Do not accept 'does not have a correlation between price and age', or ' points are not all together', or 'the points vary' without further clarification
14.(b) Any correct 18% of a value seen in working 2400 – 0.18 × 2400 (= 2400 – 432 = 1968) 1968 – 0.18 × 1968 (= 1968 – 354.24 = (£)1613.76) (£)786.24	B1 M1 M1 A1	OR B1and M2 for 2400×0.82^2 Or B1 and M1 for 2400×0.82 FT their 1968, but not 2400 CAO. Penalise further working -1 *Appreciate: B1 and SC1 for 3341.76* *Simple depreciate: B1 and M1 for 1536* *Working towards simple depreciation: B1 for sight 864*
15. Correct statement of Pythagoras' Theorem ($x^2 =$) $9.2^2 - 8.4^2$ ($x^2 =$) 14.08 OR sight of $\sqrt{14.08}$ 3.75(… cm) rounded or truncated	M1 A1 A1	Accept $9.2^2 = x^2 + 8.4^2$ Do not accept x = 14.08. Ignore further rounding to 4, if 3.7… seen in working FT from M1, A0, for correct evaluation of the √ of their value for final A1
16. Scale factor ×1.6, or equivalent Sand 28.8 or 29 (kg) Gravel 57.6 or 58 (kg) Water 8 (l)	 M1 A3	Alternative method ×1.8 to find sand, double sand to gravel, water is half cement. Award M1 for sight of any part of this alternative method. A1 for each correct answer. Any 1 correct answer implies M1 *Do not accept an answer of 28 for sand, or 57 for gravel, however award M1* If M1, A1 awarded for water 8 (litres), then award SC1 if their gravel = 2×their sand. If no marks then SC1 if their gravel = 2×their sand.

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