CCEA GCSE MATHEMATICS (MODULAR)

MATHS



EXAM QUESTION PACK

MODULE N2 PAPER 1 (NON-CALCULATOR) FOUNDATION TIER GMN21 PAPERS

STEMUP

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Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
January 2012

Mathematics

Module N2 Paper 1
(Non-calculator)
Foundation Tier

[GMN21]

WEDNESDAY 11 JANUARY
9.15 am – 10.00 am

GMN21

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all eleven** questions.
Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.
You **must not** use a calculator for this paper.

INFORMATION FOR CANDIDATES

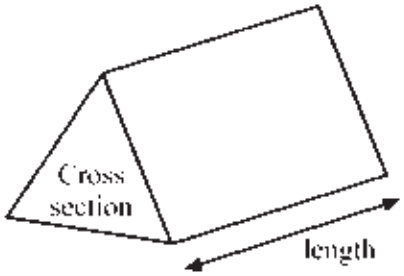
The total mark for this paper is 44.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a ruler, compasses, set-square and protractor.
The Formula Sheet is on page 2.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
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10	
11	
Total Marks	

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Formula Sheet

Volume of prism = area of cross section × length

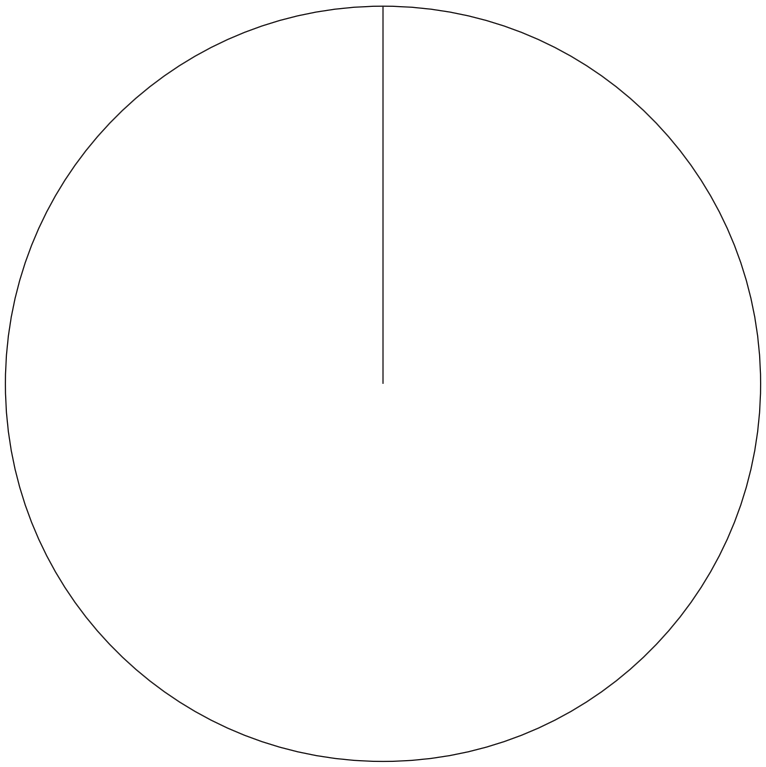


1 A travel agency recorded the types of holiday which were booked on a particular week.

The table below shows the results.

Type of Holiday	Frequency	Degrees
Bed & Breakfast	20	
Hotel half-board	22	
Self-catering	6	
Camping	12	

Complete an accurate pie chart below to show this information.



[4]

Examiner Only	
Marks	Remark

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Examiner Only	
Marks	Remark

2 Solve the equations

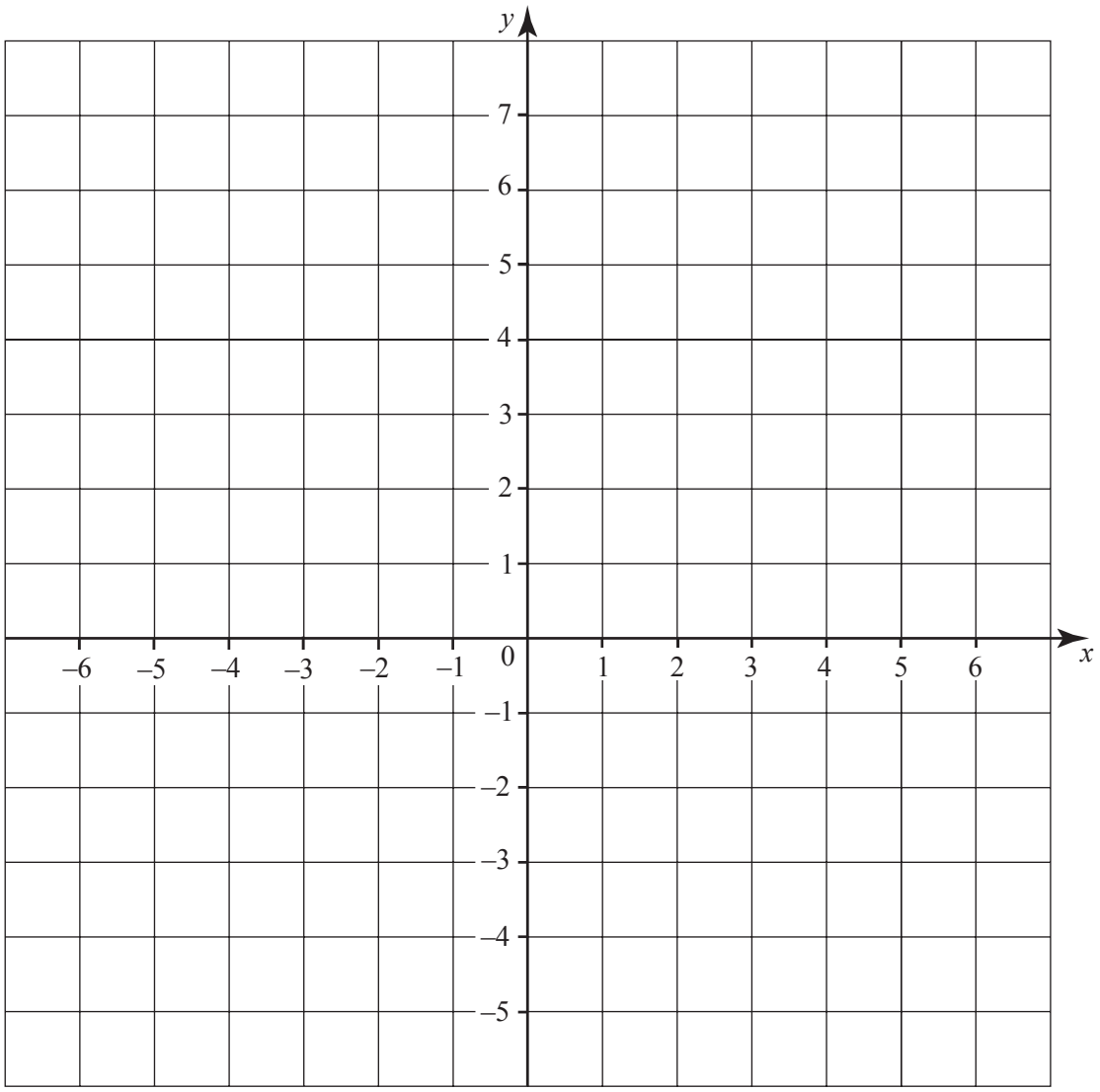
(a) $9x - 5 = 58$

Answer $x =$ _____ [2]

(b) $\frac{x}{8} = 3$

Answer $x =$ _____ [1]

3



Draw the line $x = 5$ on the grid above. [1]

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4 A group of students take class tests in both English and Mathematics.

Each test is marked out of 50.

The stem and leaf diagrams below show the distribution of marks for both tests.

	English
0	
1	2 5 6 9
2	3 6 7 7 8
3	0 2 4 5 5
4	1 2 2 3 6
5	0

	Mathematics
0	9
1	0 1 2 6 7
2	1 3 4 5 7 8 8
3	2 5 7 9
4	1 4 8
5	

Key: 2 | 5 means 25

(a) Which subject has the bigger range of marks and by how much?

Answer _____ has the bigger range by _____ [2]

(b) Which subject has the bigger median mark and by how much?

Answer _____ has the bigger median mark by _____ [2]

Examiner Only

Marks	Remark

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Examiner Only	
Marks	Remark

5 **(a)** Simplify $6x + 3y - 2x + 2y$

Answer _____ [2]

(b) Factorise

(i) $20d + 35$

Answer _____ [1]

(ii) $y^2 + y$

Answer _____ [1]

---

6 **(a)** Calculate the size of angle a.

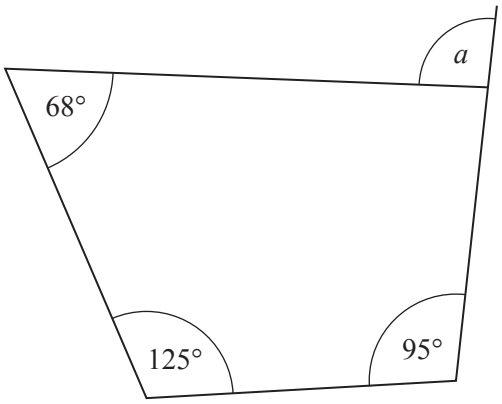


Diagram not drawn accurately

Answer a = _____° [3]

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(b) A square just touches an equilateral triangle as shown.

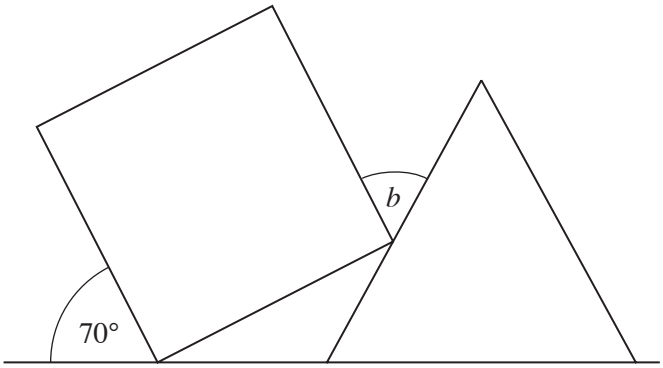


Diagram not drawn accurately

Calculate the size of angle b.

Answer b = _____° [3]

(c) AB is parallel to CD. EF is a straight line. BC = BD. Angle ABC = 42°.

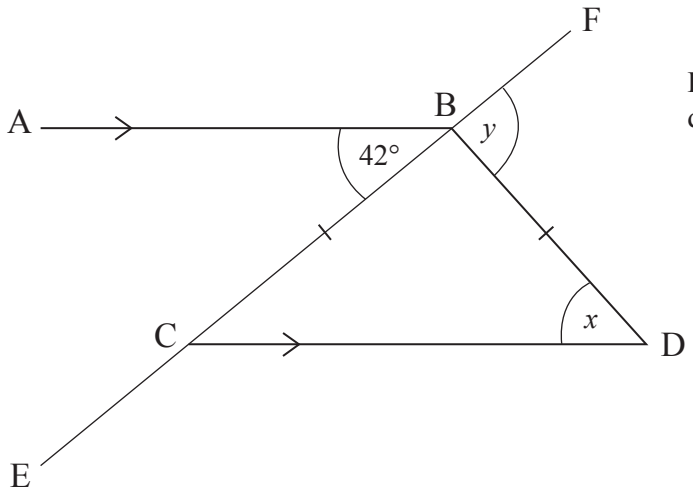


Diagram not drawn accurately

(i) Calculate the size of angle x.

Answer x = _____° [1]

(ii) Calculate the size of angle y.

Answer y = _____° [2]

Examiner Only

Marks	Remark

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Examiner Only	
Marks	Remark

7 Aaron wants to find out how often people go to the cinema.
He designs the following questionnaire to use to gather data for his survey.

> How often do you go to the cinema?
>
> Tick one box below.
>
> Not very often ☐ Sometimes ☐ A lot ☐

(a) Write down two things that are wrong with this questionnaire.

1. _____

_____

2. _____

_____ [2]

(b) Design a better questionnaire for him to use to find out how often people go to the cinema.
You should include some response boxes.

[2]

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Examiner Only	
Marks	Remark

8 A minibus can carry 10 passengers and a car can carry 4 passengers.

Write down an expression for the **total** number of passengers that can be carried in x minibuses and y cars.

Answer _____ [2]

---

9 **(a)** Write 24 as a product of prime factors.

Answer _____ [2]

(b) Hence or otherwise find the lowest common multiple (LCM) of 24 and 30.

Answer _____ [2]

---

10 **(a)** Expand and simplify $7(2a + 3) + 3(4a - 2)$.

Answer _____ [2]

(b) Kyle bought 6 pears at x pence each and 3 tins of meat at $4x$ pence each. He got £4.24 change from £10

Write down an equation in terms of x and solve it to find the value of x.

Answer x = _____ [4]

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11 From a large bottle containing $2\frac{1}{2}$ litres of lemonade, a girl pours four full glasses each holding $\frac{2}{5}$ litre.

How many **more** full glasses can she pour before running short of lemonade?

Answer _____ [3]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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Rewarding Learning

General Certificate of Secondary Education
January 2012

Mathematics

Module N2 Paper 1
(Non-calculator)
Foundation Tier

[GMN21]

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It is our intention to reward candidates for any demonstration of relevant knowledge, skills or understanding. For this reason we adopt a policy of following through their answers, that is, having penalised a candidate for an error, we mark the succeeding parts of the question using the candidate's value or answers and award marks accordingly.

Some common examples of this occur in the following cases:

(a) a numerical error in one entry in a table of values might lead to several answers being incorrect, but these might not be essentially separate errors;

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(iii) If the correct answer is seen in working but a completely different answer is seen in the answer space, then some marks will be awarded depending on the severity of the error.

(iv) Work crossed out but not replaced should be marked.

(v) In general, if two or more methods are offered, mark only the method that leads to the answer on the answer line. If two (or more) answers are offered (with no solution offered on the answer line), mark the poorest answer.

(vi) For methods not provided for in the mark scheme, give as far as possible equivalent marks for equivalent work.

(vii) Where a follow through mark is indicated on the mark scheme for a particular part question, the marker must ensure that you refer back to the answer of the previous part of the question.

(viii) Unless the question asks for an answer to a specific degree of accuracy, always mark at the greatest number of significant figures seen. E.g. the answer in the mark scheme is 4.65 and the candidate then correctly rounds to 4.7 or 5 on the answer line. Allow full marks for 4.65 seen in the working.

(ix) Anything in the mark scheme which is in brackets (…) is not required for the mark to be earned, but if present it must be correct.

(x) For any question, the range of answers given in the mark scheme is inclusive.

Quality of written communication

In GCSE Mathematics, particular questions are identified where candidates must demonstrate the quality of their written communication.

In particular, candidates must:

(i) ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear (i.e. comprehension and meaning is clear by using the correct notation and labelling conventions);

(ii) select and use a form and style of writing appropriate to their purpose and to complex subject matter (i.e. reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning); and

(iii) organise information clearly and coherently, using specialist vocabulary where appropriate (i.e the mathematical methods and processes used are coherently and clearly organised and appropriate mathematical vocabulary used).

This assessment may be through, for example, an explanation of the geometrical properties of a given shape or, for example, through concise mathematical argument in a multi-step problem.

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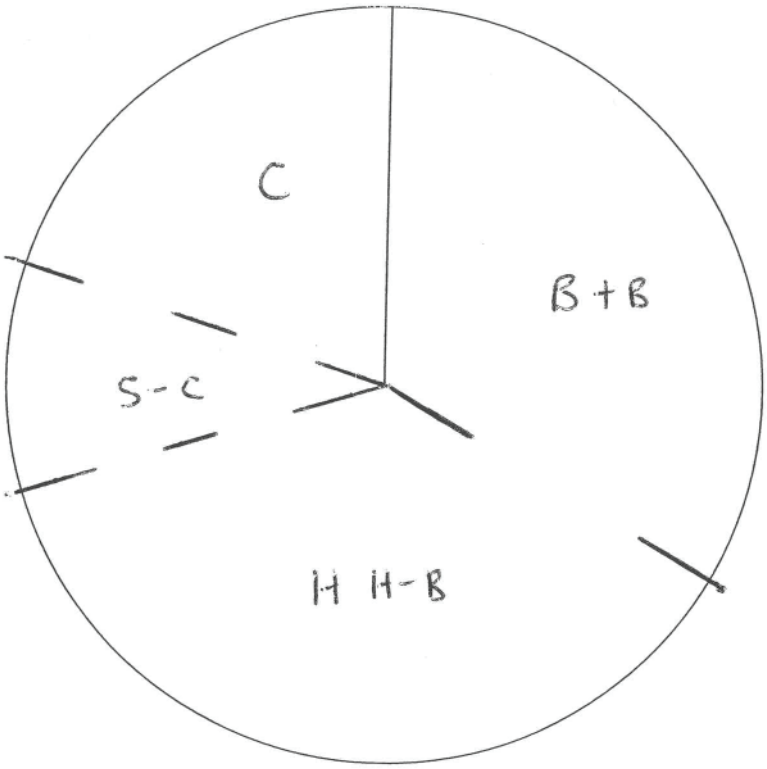
			AVAILABLE MARKS
1	Angles are 120°, 132°, 36° and 72°	M1, A1	
	Each sector correctly drawn and labelled (±2°) (For no work shown A1 each correct, labelled sector)	MA2	4
2	**(a)** $9x = 63$ $x = 7$	MA1 A1	
	(b) 24	MA1	3
3	Correct line	A1	1
4	**(a)** Mathematics; (39 – 38 =) 1	A1, A1	
	(b) English; (31 – 26 =) 5	A1, A1	4
5	**(a)** $4x + 5y$	A1, A1	
	(b) **(i)** $5(4d + 7)$	A1	
	(ii) $y(y + 1)$	A1	4
6	**(a)** $360 – (68 + 125 + 95) = 72$	M1, A1	
	$a = 180 – 72 = 108$	A1	
	(b) $180 – (70 + 90) = 20$	MA1	
	$180 – (20 + 120) = 40$	MA1	
	$b = 180 – (40 + 90) = 50$	MA1	
	(c) **(i)** $x = 42$	A1	
	(ii) $180 – (42 + 42) = 96$	MA1	
	$y = 180 – 96$ $= 84$	MA1	9
7	**(a)** 1. No time period	A1	
	2. Labels on boxes too vague	A1	
	(b) Use of time period	A1	
	Good response boxes (at least three)	A1	4

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			AVAILABLE MARKS
8	$10x + 4y$	A1, A1	2
9	**(a)** $2 \times 2 \times 2 \times 3$ or $2^3 \times 3$	M1, A1	
	(b) $30 = 2 \times 3 \times 5$	MA1	
	LCM = 120	A1	4
10	**(a)** $14a + 21 + 12a - 6$	MA1	
	$26a + 15$	MA1	
	(b) $6x + 12x + 424 = 1000$ (or equivalent)	M1, A1	
	$18x = 576$	MA1	
	$x = 32$	A1	6
11	$2.5 - 4 \times 0.4 = 0.9$	MA1	
	$0.9 \div 0.4 = 2.25$	MA1	
	2	A1	3
		Total	**44**

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GCSE MATHEMATICS JANUARY 2012
MODULE N2–1
OVERLAY QUESTION 1



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Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2011

Mathematics



Module N2 Paper 1
(Non-calculator)
Foundation Tier

[GMN21]

TUESDAY 31 MAY

9.15 am–10.00 am

GMN21

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

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Write your answers in the spaces provided in this question paper.
Answer **all thirteen** questions.
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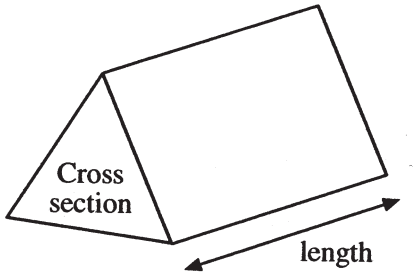
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For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
Total Marks	

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Formula Sheet

Volume of prism = area of cross section × length



Examiner Only	
Marks	Remark

1 The stem and leaf diagram shows the weights of bags of onions.

3	5 7 8 9	Key 3 | 5 = 3.5 kg
4	2 5 6 8 9 9	
5	1 3 4	

Write down

(a) the range,

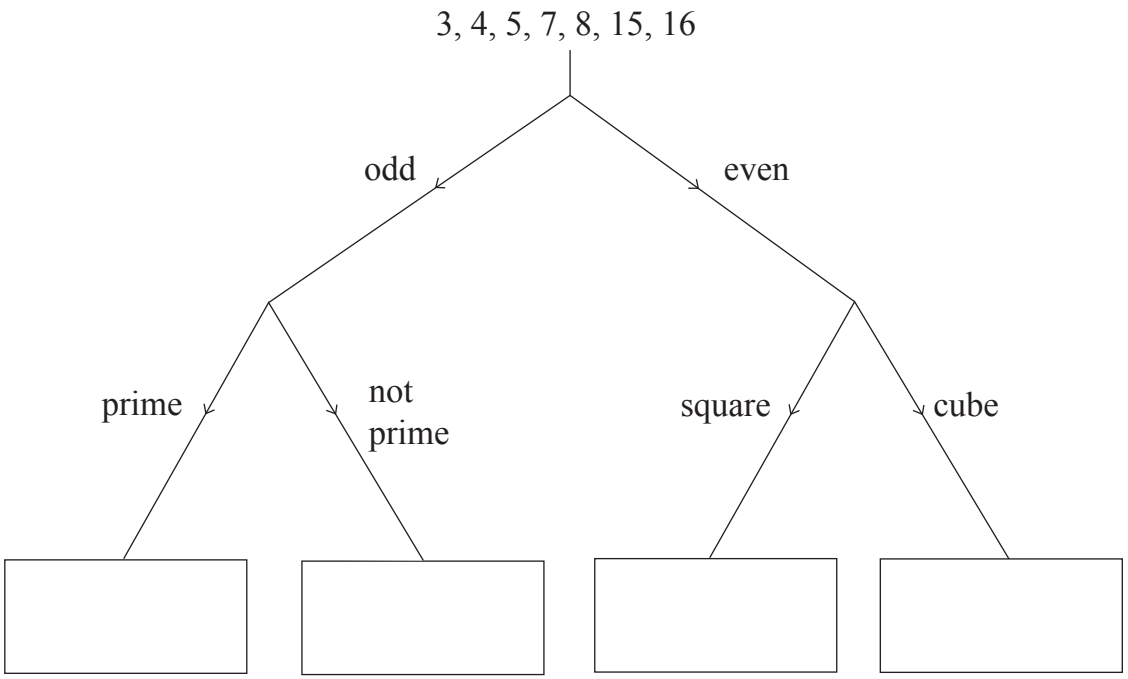
Answer _____ kg [1]

(b) the median.

Answer _____ kg [1]

---

2 Using the decision tree diagram, sort these numbers into the correct boxes.



[2]

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3 Calculate

Examiner Only	
Marks	Remark

(a) 0.6×0.4

Answer _____ [1]

(b) $\frac{5}{6} - \frac{1}{2}$

Answer _____ [2]

(c) $7.3 - 3.86$

Answer _____ [1]

(d) $\frac{3}{4} \times \frac{2}{5}$ giving your answer in its simplest form.

Answer _____ [2]

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Examiner Only	
Marks	Remark

4 Solve

(a) $\frac{p}{6} = 3$

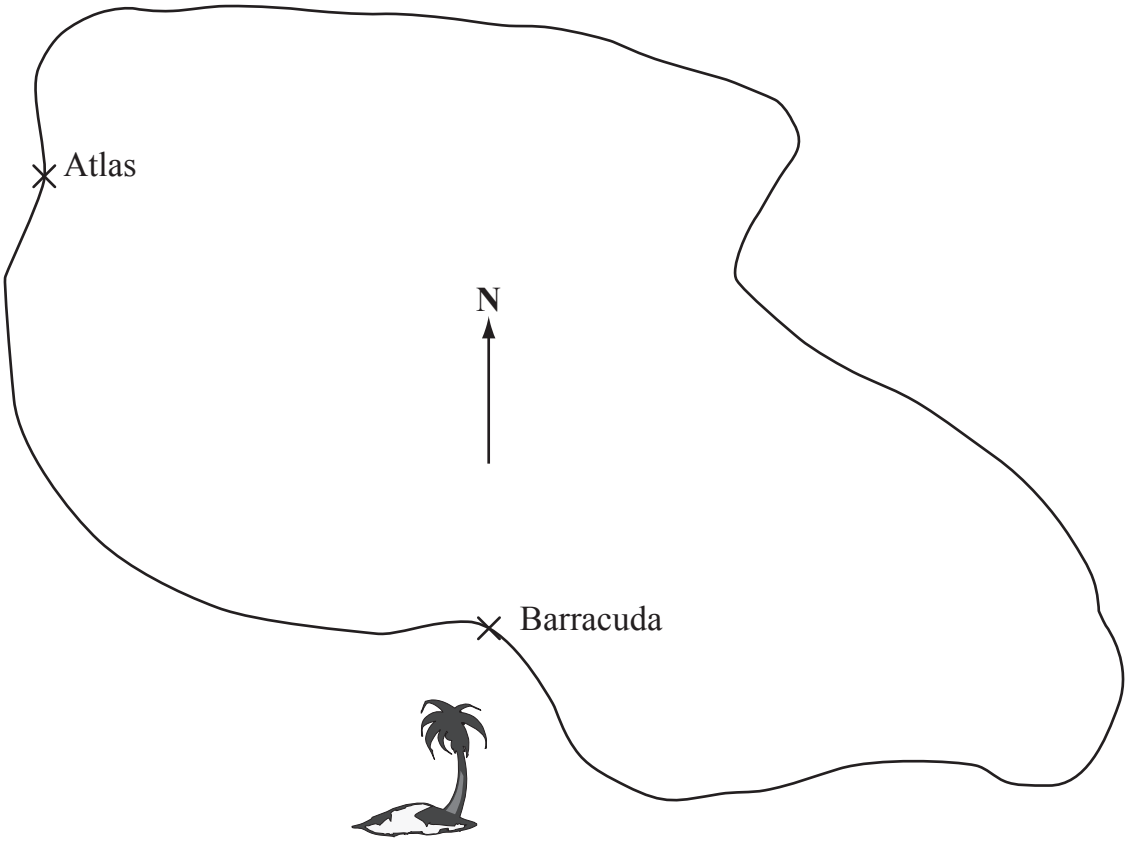
Answer $p =$ _____ [1]

(b) $3t - 7 = 5$

Answer $t =$ _____ [2]

5 An outline map of Tanua Island is shown.

The Atlas and the Barracuda are two hotels on this island.



Scale: 1 cm to 5 km

(a) Use the diagram to calculate the actual distance of the Atlas from the Barracuda.

Answer _____ km [2]

(b) A new hotel, the Capri, is being built 25 km from the hotel Atlas on a bearing of 110°. Mark the correct position of this new hotel. [2]

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Examiner Only	
Marks	Remark

6 The Ross family eat $\frac{3}{5}$ of a loaf of bread each day.

What is the least number of loaves they will need to buy for 9 days?

Answer _____ [3]

7 Lines AB, CD and EF are parallel.

Angles of 96° and 60° are marked in the diagram as shown.

Calculate the size of the angles marked x, y and z.

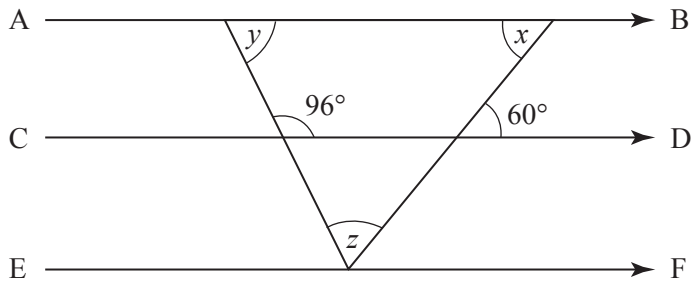


Diagram not drawn accurately

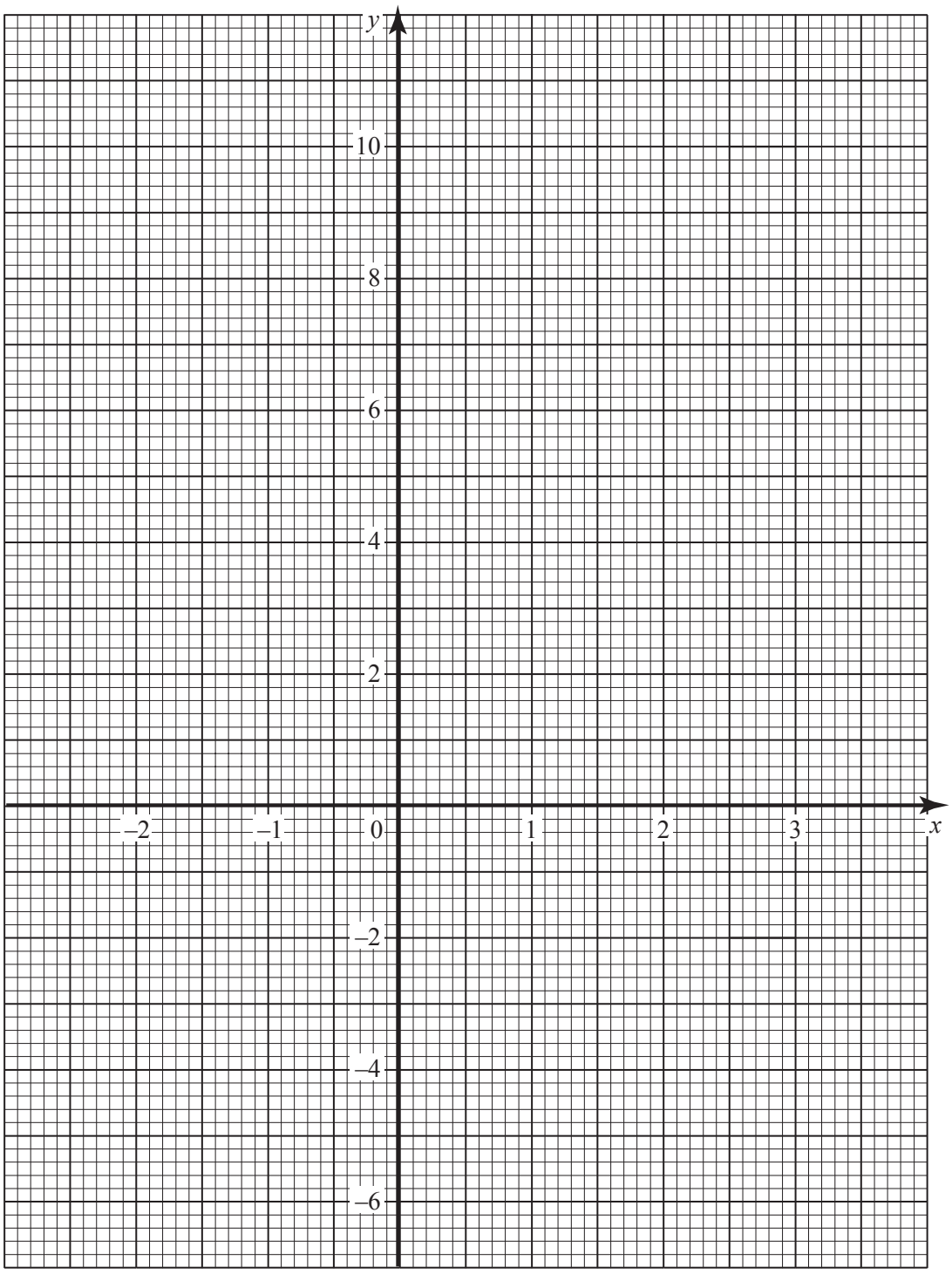
Answer Angle x = _____° [1]

Angle y = _____° [1]

Angle z = _____° [1]

8 Draw the graph of $y = 4 - 3x$ on the graph paper below.

Examiner Only	
Marks	Remark

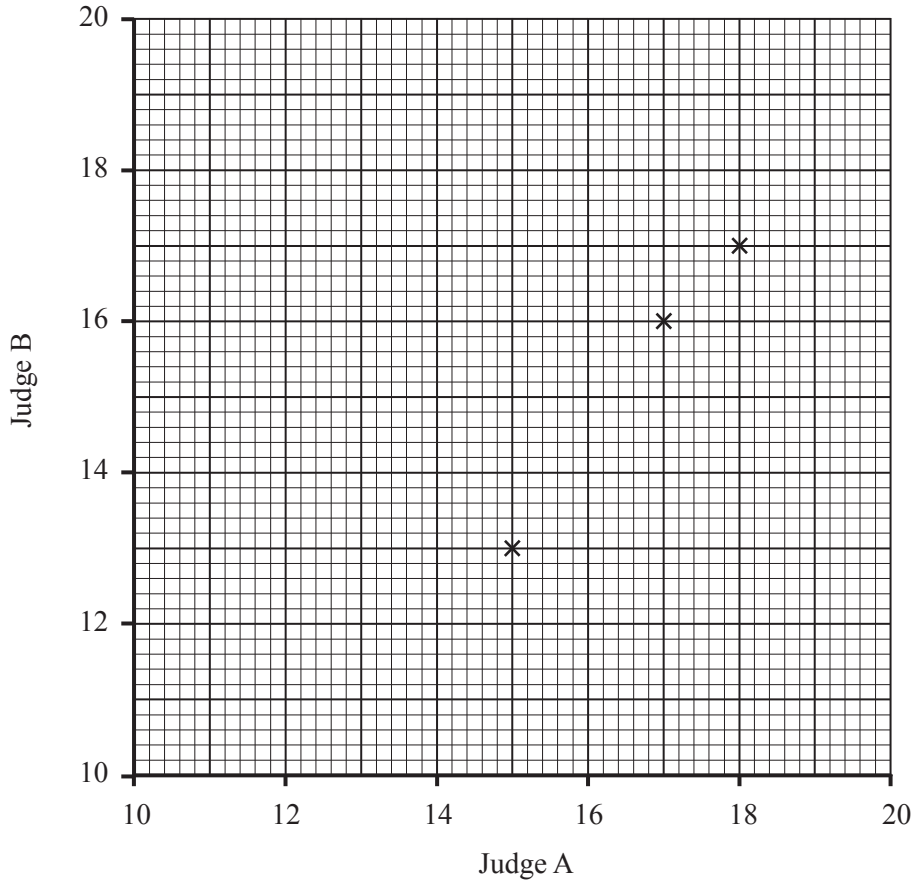


[3]

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9 The table shows the marks awarded by two judges to the first eight competitors in a gymnastics competition.

Judge A	**18**	**15**	**17**	13	19	15	12	18
Judge B	**17**	**13**	**16**	13	18	16	14	16



(a) The first three points have already been plotted.

Use the data to complete the scatter graph. [2]

(b) Draw the line of best fit. [1]

(c) Another competitor was awarded 14 marks by Judge A.

Estimate the marks awarded to this competitor by Judge B.

Answer _____ [1]

(d) What type of correlation does your graph show?

Answer _____ [1]

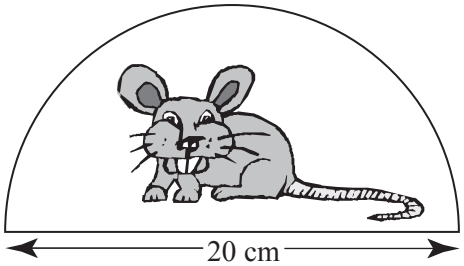
Examiner Only

Marks	Remark

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10 **(a)** A computer mouse mat is semi-circular in shape. It has a diameter of 20 cm. Taking $\pi = 3.142$, calculate the area of the mat.



Answer _____ cm^2 [2]

(b) Find the midpoint of the line joining the points A (–1, 6) and B (3, –2).

Answer (_____ , _____) [2]

---

11 Write 84 as a product of prime factors. Express your answer in index notation.

Answer _____ [3]

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Examiner Only	
Marks	Remark

12 Expand and simplify

$$(x - 6)(x + 4)$$

Answer _____ [2]

13 The times that 100 students spent watching TV during one weekend were recorded. The times were grouped as shown in the table.

Time *t* (hours)	**Frequency**		
$0 < t \leq 2$	4		
$2 < t \leq 4$	18		
$4 < t \leq 6$	32		
$6 < t \leq 8$	20		
$8 < t \leq 10$	16		
$10 < t \leq 12$	10		

Calculate an estimate for the mean time.

Answer _____ hours [4]

THIS IS THE END OF THE QUESTION PAPER

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GCSE MATHEMATICS 2011

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(iii) If the correct answer is seen in working but a completely different answer is seen in the answer space, then some marks will be awarded depending on the severity of the error.

(iv) Work crossed out but not replaced should be marked.

(v) In general, if two or more methods are offered, mark only the method that leads to the answer on the answer line. If two (or more) answers are offered (with no solution offered on the answer line), mark the poorest answer.

(vi) For methods not provided for in the mark scheme, give as far as possible equivalent marks for equivalent work.

(vii) Where a follow through mark is indicated on the mark scheme for a particular part question, the marker must ensure that you refer back to the answer of the previous part of the question.

(viii) Unless the question asks for an answer to a specific degree of accuracy, always mark at the greatest number of significant figures seen. E.g. the answer in the mark scheme is 4.65 and the candidate then correctly rounds to 4.7 or 5 on the answer line. Allow full marks for 4.65 seen in the working.

(ix) Anything in the mark scheme which is in brackets (...) is not required for the mark to be earned, but if present it must be correct.

(x) For any question, the range of answers given in the mark scheme is inclusive.

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			AVAILABLE MARKS
1	**(a)** 1.9	A1	
	(b) 4.6	A1	2
2	3, 5, 7 15 4, 16 8 A1 for 4 correct	A2	2
3	**(a)** 0.24	A1	
	(b) $\frac{1}{2} = \frac{3}{6}$	A1	
	$\frac{2}{6}$ or $\frac{1}{3}$	A1	
	(c) 3.44	A1	
	(d) $\frac{6}{20}$	MA1	
	$\frac{3}{10}$	A1	6
4	**(a)** $p = 18$	MA1	
	(b) $3t = 12$	MA1	
	$t = 4$	MA1	3
5	**(a)** 8.4 ± 0.2	MA1	
	42 ± 1	MA1	
	(b) Correct Bearing and Correct Distance	A1 A1	4
6	$9 \times \frac{3}{5}$ or $\frac{3}{5}+\frac{3}{5}+\frac{3}{5}+\frac{3}{5}+\frac{3}{5}+\frac{3}{5}+\frac{3}{5}+\frac{3}{5}+\frac{3}{5}$	M1	
	$\frac{27}{5}$ or $5\frac{2}{5}$ or 5.4	A1	
	6	MA1	3
7	60	A1	
	84	MA1	
	36	MA1	3

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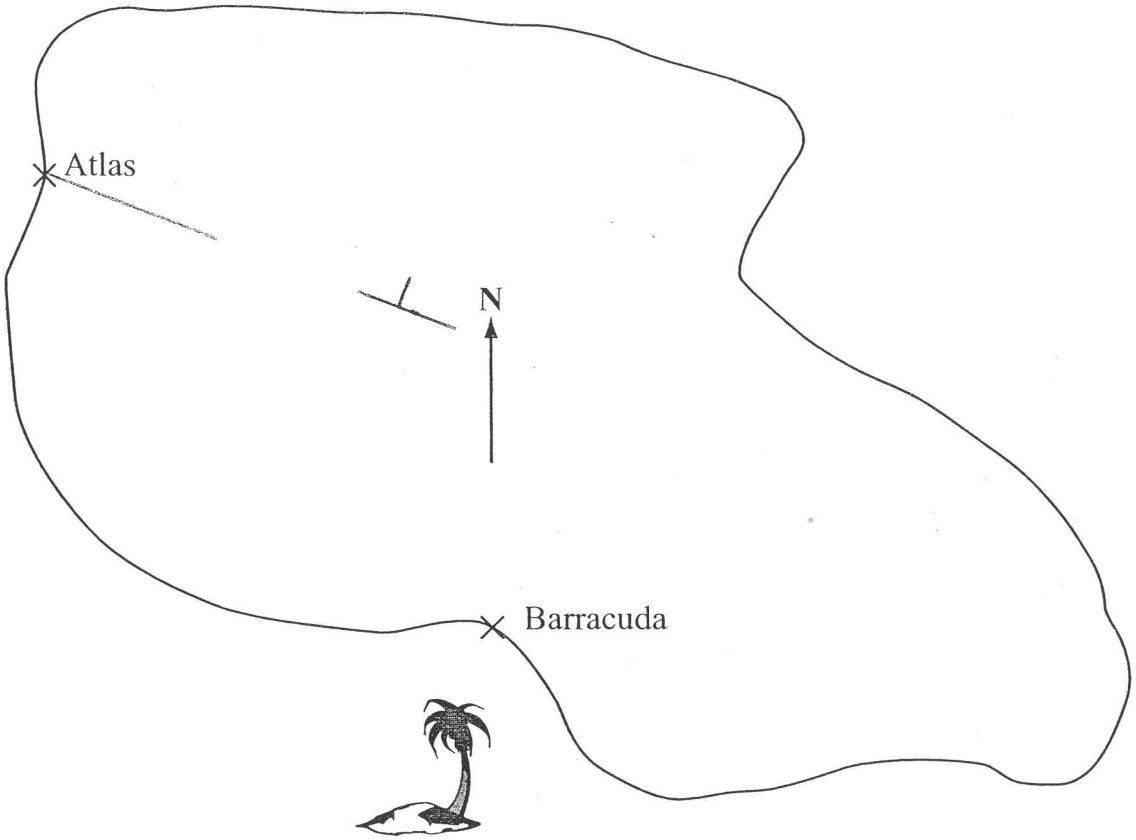
			AVAILABLE MARKS
8	2 points correctly identified	MA1	
	2 points accurately plotted	A1	
	Straight line	A1	3
9	**(a)** correct points (allow A1 for 3 correct)	A2	
	(b) oblique line with roughly half the points on either side	A1	
	(c) follow pupil's line	A1	
	(d) positive	A1	5
10	**(a)** $\frac{1}{2} \times \pi \times 10^2$	M1	
	157.1 or 157	A1	
	(b) (1, 2)	A1 A1	4
11	$2 \overline{)84}$ $2 \overline{)42}$ $3 \overline{)21}$ 7	M1 A1	
	$2^2 \times 3 \times 7$	A1	3
12	$x^2 - 6x + 4x - 24$	MA1	
	$x^2 - 2x - 24$	A1	2
13			

Mid-Points	fx
1	4
3	54
5	160
7	140
9	144
11	110

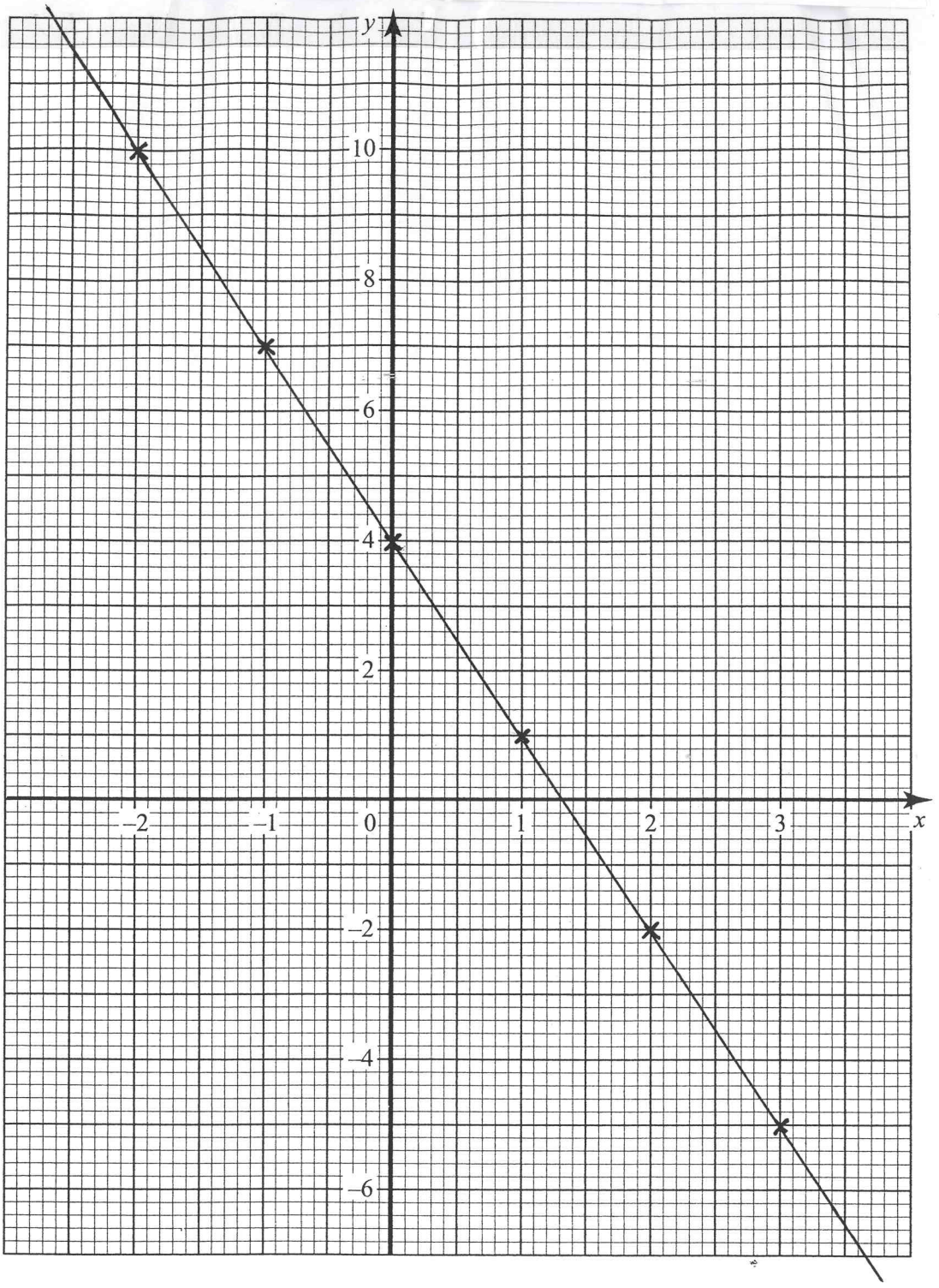
fx products	M1	
612	A1	
$612 \div 100 = 6.12$	M1 A1	4
	Total	**44**

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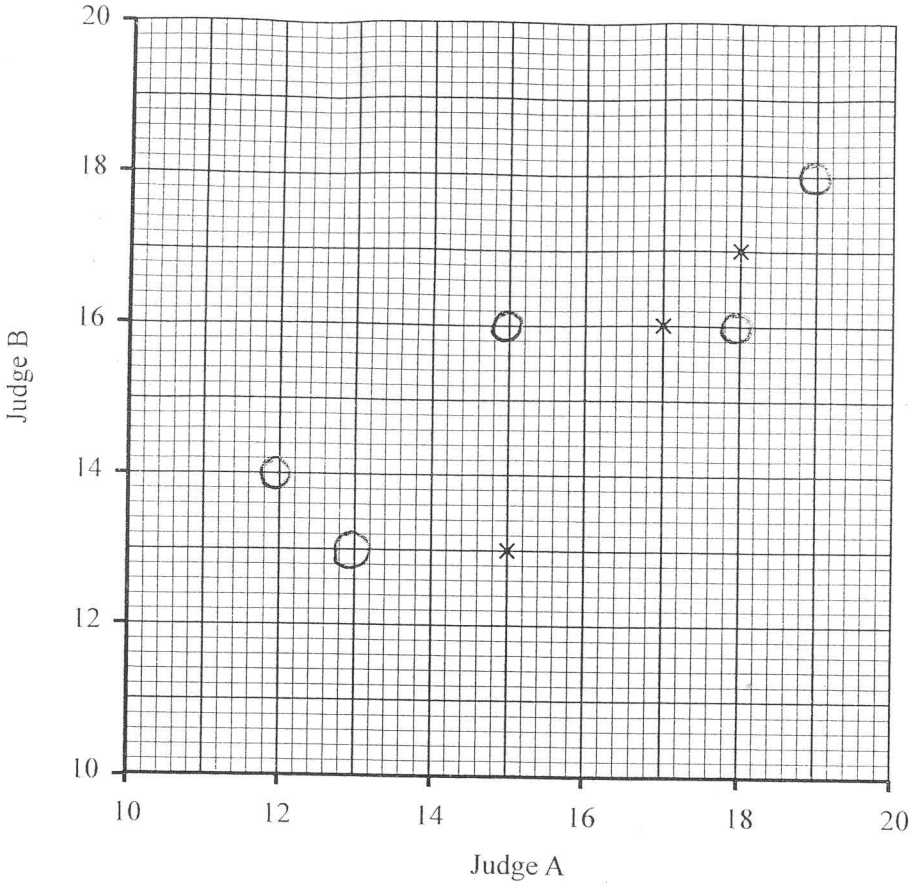
GCSE MATHEMATICS SUMMER 2011
MODULE N2-1
OVERLAY QUESTION 5



GCSE MATHEMATICS SUMMER 2011
MODULE N2-1
OVERLAY QUESTION 8



GCSE MATHEMATICS SUMMER 2011
MODULE N2-1
OVERLAY QUESTION 9



Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
January 2011

Mathematics

Module N2 Paper 1
(Non-calculator)
Foundation Tier

[GMN21]

TUESDAY 11 JANUARY
9.15 am – 10.00 am

GMN21

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all eleven** questions.
Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.
You **must not** use a calculator for this paper.

INFORMATION FOR CANDIDATES

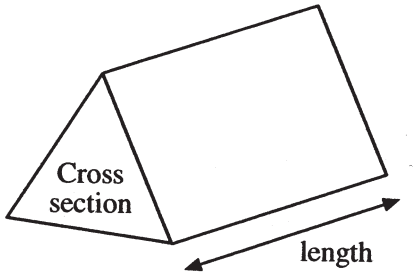
The total mark for this paper is 44.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a ruler, compasses, set-square and protractor.
The Formula Sheet is on page 2.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
Total Marks	

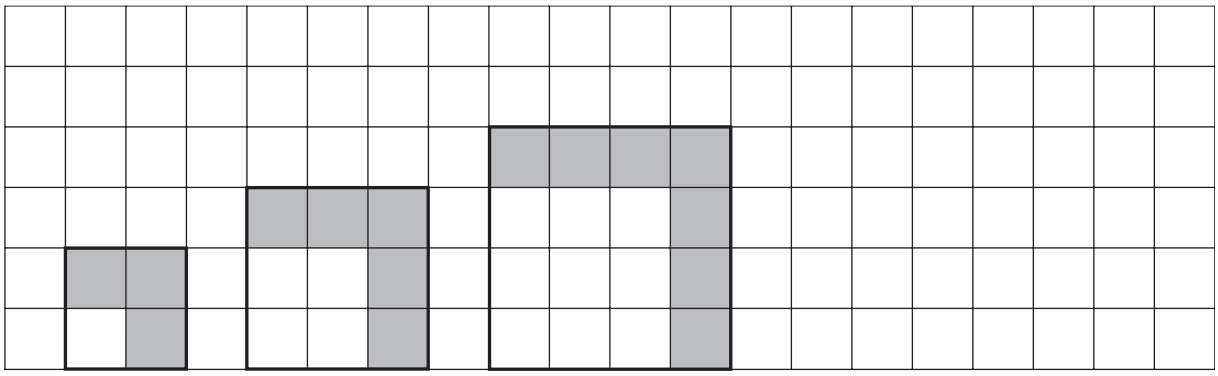
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Formula Sheet

Volume of prism = area of cross section × length



1 A sequence of patterns is drawn below.



$2^2 - 1^2$ $3^2 - 2^2$ $4^2 - 3^2$

Examiner Only	
Marks	Remark

(a) Draw the pattern for $5^2 - 4^2$ [1]

(b) Fill in the blanks in the table

$2^2 - 1^2 =$	4	–	1	= 3
$3^2 - 2^2 =$	9	–	4	= 5
$4^2 - 3^2 =$	16	–	9	= 7
$5^2 - 4^2 =$	___	–	___	= ___

[1]

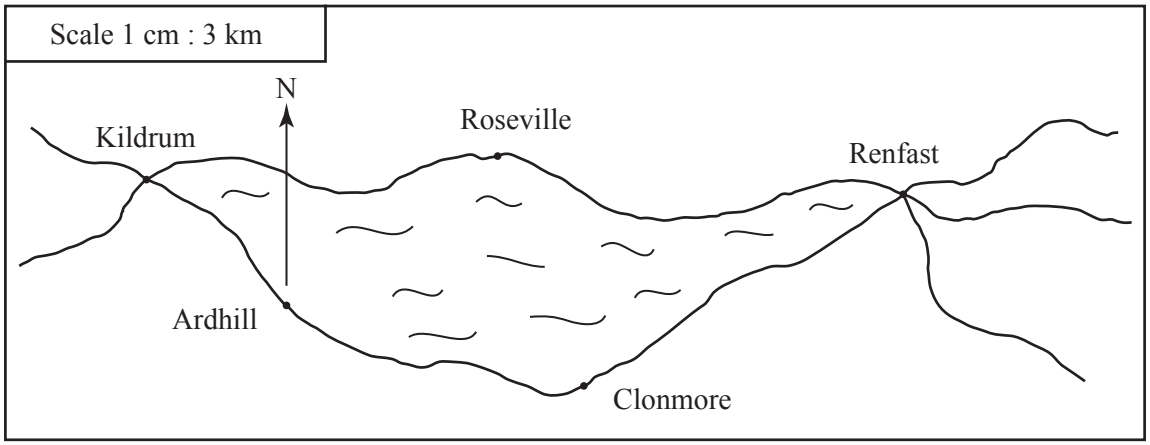
(c) Use the pattern in your table to find easily the answer to

$$500^2 - 499^2$$

Answer _____ [1]

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2 The map shows the position of five towns around a lake.



(a) Use the map to measure the bearing of Roseville from Ardhill.

Answer _____ ° [1]

(b) Use the map and scale to find the direct distance across the lake between Kildrum and Clonmore.

Answer _____ km [3]

Examiner Only

Marks	Remark

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3 Work out

Examiner Only	
Marks	Remark

(a) 5^3

Answer _____ [1]

(b) $4.2 - 1.66$

Answer _____ [1]

(c) 0.3×0.3

Answer _____ [1]

(d) the cube root of 64

Answer _____ [1]

(e) $\frac{3}{4} - \frac{5}{12}$

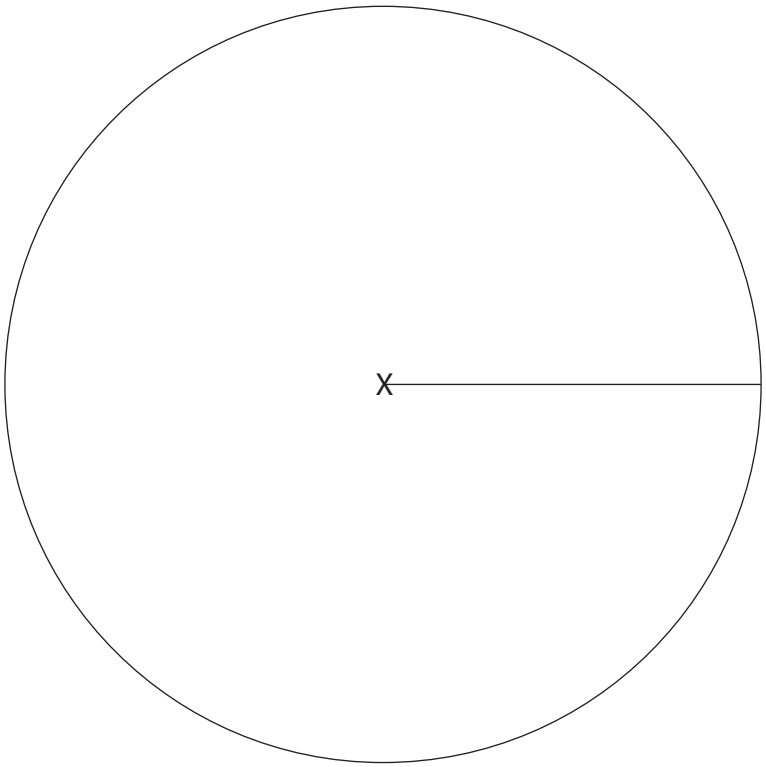
Answer _____ [2]

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4 The colours of the cars passing the school gates were noted during a school day.

Colour	Red	Blue	Black	Green	Silver	Other
Number of cars	6	12	2	10	8	2

Draw a clearly labelled pie chart for this data.



[4]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

5 VWXYZ is a regular pentagon.

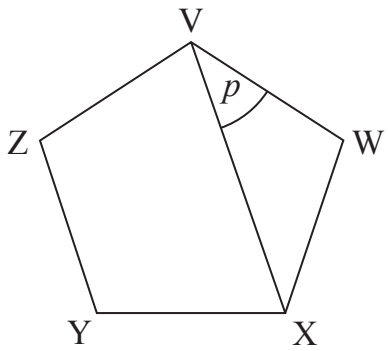


Diagram not drawn accurately

Calculate angle p.
Show your working.

Answer _____ ° [3]

---

6 A baker uses $\frac{3}{5}$ of a bag of flour to make 6 muffins.

How many bags of flour will he need to make 48 muffins?

Answer _____ bags [3]

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Examiner Only	
Marks	Remark

7 The school bus for Oldtown Secondary School carried a mixture of boys and girls. Some of the students were wearing scarves.

(a) Design a table in the space below which could be used to record the numbers of boys and girls and the numbers of each wearing scarves and not wearing scarves.

[3]

(b) There were 40 students on the bus. Show how they might have been recorded in your table above. [1]

---

8 **(a)** Solve $18 - 3x = 2 + 5x$

Answer _____ [3]

(b) Solve $\frac{21-2x}{3} = 5$

Answer _____ [3]

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Examiner Only	
Marks	Remark

9 The heights of trees in an orchard were recorded. The heights were grouped as shown in the table.

Height h (metres)	Frequency	Mid Point	
$0 < h \leq 2$	12	1	
$2 < h \leq 4$	8	3	
$4 < h \leq 6$	12		
$6 < h \leq 8$	10		
$8 < h \leq 10$	7		
$10 < h \leq 12$	1		

(a) Which class interval contains the median height?

Answer _____ [1]

(b) Complete the table and hence find an estimate for the mean height of the trees.

Answer _____ m [3]

---

10 **(a)** Convert $0.6\,m^3$ into cm^3

Answer _____ cm^3 [2]

(b) P is the point (8, –1) and Q is the point (–2, 3)

Find the co-ordinates of the midpoint of the line PQ.

Answer (_____ , _____) [2]

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11 Work out $5\frac{3}{4} - 2\frac{5}{6}$

Give your answer as a mixed number.

Answer _____ [3]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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Rewarding Learning

General Certificate of Secondary Education
January 2011

Mathematics

Module N2 Paper 1
(Non-calculator)
Foundation Tier

[GMN21]

TUESDAY 11 JANUARY
9.15 am – 10.00 am

MARK SCHEME

STEMUP.CO.UK

Introduction

The mark scheme normally provides the most popular solution to each question. Other solutions given by candidates are evaluated and credit given as appropriate; these alternative methods are not usually illustrated in the published mark scheme.

The marks awarded for each question are shown in the right hand column and they are prefixed by the letters **M**, **A** and **MA** as appropriate. The key to the mark scheme is given below:

M indicates marks for correct method.

A indicates marks for accurate working, whether in calculation, readings from tables, graphs or answers.

MA indicates marks for combined method and accurate working.

The solution to a question gains marks for correct method and marks for an accurate working based on this method. Where the method is not correct no marks can be given.

A later part of a question may require a candidate to use an answer obtained from an earlier part of the same question. A candidate who gets the wrong answer to the earlier part and goes on to the later part is naturally unaware that the wrong data is being used and is actually undertaking the solution of a parallel problem from the point at which the error occurred. If such a candidate continues to apply correct method, then the candidate's individual working must be **followed through** from the error. If no further errors are made, then the candidate is penalised only for the initial error. Solutions containing two or more working or transcription errors are treated in the same way. This process is usually referred to as "follow-through marking" and allows a candidate to gain credit for that part of a solution which follows a working or transcription error.

It should be noted that where an error trivialises a question, or changes the nature of the skills being tested, then as a general rule, it would be the case that not more than half the marks for that question or part of that question would be awarded; in some cases the error may be such that no marks would be awarded.

Positive marking:

It is our intention to reward candidates for any demonstration of relevant knowledge, skills or understanding. For this reason we adopt a policy of **following through** their answers, that is, having penalised a candidate for an error, we mark the succeeding parts of the question using the candidate's value or answers and award marks accordingly.

Some common examples of this occur in the following cases:

(a) a numerical error in one entry in a table of values might lead to several answers being incorrect, but these might not be essentially separate errors;

(b) readings taken from candidates' inaccurate graphs may not agree with the answers expected but might be consistent with the graphs drawn.

When the candidate misreads a question in such a way as to make the question easier only a proportion of the marks will be available (based on the professional judgement of the examiner).

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			AVAILABLE MARKS
1	**(a)** Pattern correctly drawn	A1	
	(b) $25 - 16 = 9$	A1	
	(c) $500^2 - 499^2 = 499 + 500 = 999$	A1	3
2	**(a)** 055 ($\pm$ 2)	A1	
	(b) 6.4 cm ($\pm$ 0.2) 6.4×3 $= 19.2$ ($\pm$ 0.6)	MA1 M1 A1	4
3	**(a)** 125	A1	
	(b) 2.54	A1	
	(c) 0.09	A1	
	(d) 4	A1	
	(e) $\frac{9}{12} - \frac{5}{12}$	MA1	
	$\frac{1}{3}$ or equivalent	A1	6
4	40 cars = 360° 1 car = 9°	MA1	
	Red 54° Blue 108° Black 18° Green 90° Silver 72° Other 18°	Angles MA1	
	Sectors and labels	A1, A1	4
5	Interior angle of pentagon = 108 {ext = 72; int = 180 − 72 = 108} {3 × 180 = 540; 540/5 = 108}	M1 A1	
	p = (180 − 108)/2 = 36	MA1	3

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6 $48 \div 6 = 8$ MA1

$8 \times \frac{3}{5} = 4\frac{4}{5}$ MA1

5 MA1 — 3

7 **(a)**

	Scarf	No scarf
Boy		
Girl		

2×2 squares MA1
Labels MA1, MA1

(b) Suitable numbers totalling to 40 MA1 — 4

8 **(a)** $18 - 2 = 5x + 3x$ MA2

$16 = 8x$

$2 = x$ MA1

(b) $21 - 2x = 15$ MA1

$2x = 6$ MA1

$x = 3$ A1 — 6

9 **(a)** $4 < \boldsymbol{h} \leq 6$ MA1

(b)

	F	**Mid Pt (x)**	**Fx**
$0 < \boldsymbol{h} \leq 2$	12	1	12
$2 < \boldsymbol{h} \leq 4$	8	3	24
$4 < \boldsymbol{h} \leq 6$	12	5	60
$6 < \boldsymbol{h} \leq 8$	10	7	70
$8 < \boldsymbol{h} \leq 10$	7	9	63
$10 < \boldsymbol{h} \leq 12$	1	11	11
	50		240

fx M1

$\text{mean} = \frac{240}{50} = 4.8$ M1A1 — 4

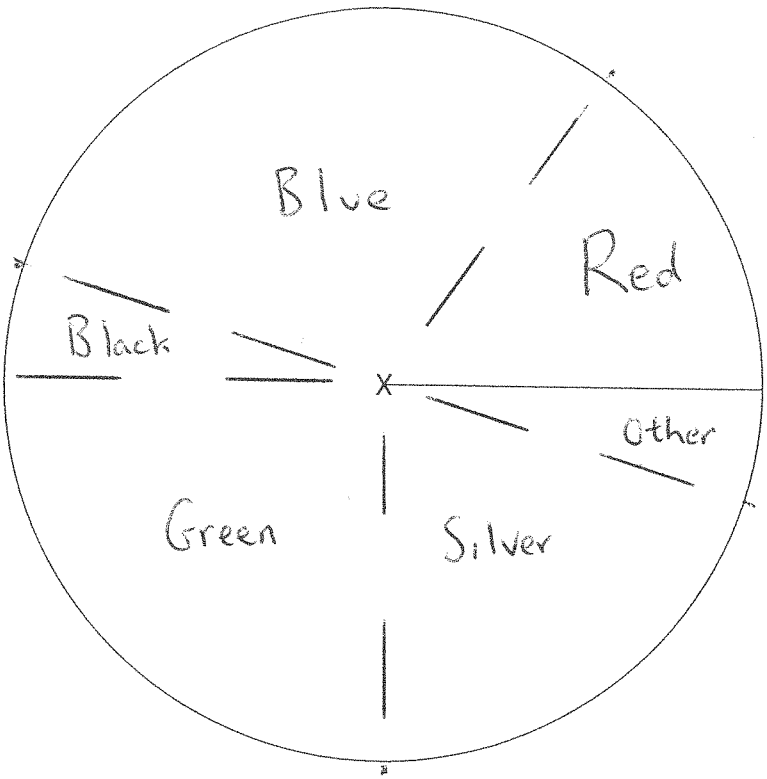
AVAILABLE MARKS

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			AVAILABLE MARKS
10	**(a)** 0.6×100^3 600000	M1 A1	
	(b) (3, 1)	A1, A1	4
11	$5\frac{9}{12} - 2\frac{10}{12}$ or $\frac{23}{4} - \frac{17}{6}$	MA1	
	$= 3 - \frac{1}{12}$ or $\frac{69}{12} - \frac{34}{12}$	A1	
	$= \frac{35}{12} = 2\frac{11}{12}$	A1	3
		Total	**44**

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GCSE MATHEMATICS JANUARY 2011
MODULE N2-1
OVERLAY QUESTION 4



Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2010

Mathematics



Module N2 Paper 1
(Non-calculator)
Foundation Tier

[GMN21]

GMN21

TUESDAY 1 JUNE

9.15 am – 10.00 am

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

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Write your answers in the spaces provided in this question paper.
Answer **all eleven** questions.
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INFORMATION FOR CANDIDATES

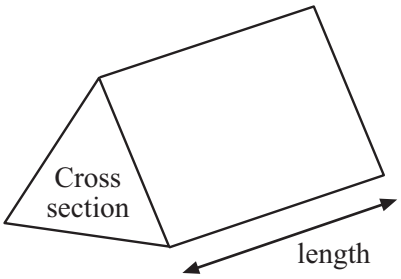
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For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
Total Marks	

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Formula Sheet

Volume of prism = area of cross section × length



Examiner Only	
Marks	Remark

1 The stem and leaf diagram shows the ages, in years, of 24 ladies who took part in the Belfast "Runher" 8 km Fun Run in October 2008.

1	8 9 9
2	0 1 1 4 5
3	2 3 3 3 6 7 8 9
4	0 1 2 4 4 5
5	3 4

Key: 1 | 8 means 18 years old

(a) Write down the modal age.

Answer _____ [1]

(b) How many of the ladies were less than 35 years old?

Answer _____ [1]

(c) Exactly a quarter of the ladies are above a certain age.
What is that age?

Answer _____ [2]

---

2 Solve the equations

(a) $7x - 4 = 38$

Answer x = _____ [2]

(b) $\frac{x}{4} = 7$

Answer x = _____ [1]

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Examiner Only	
Marks	Remark

3 **(a)** Work out the size of the angle marked x in the diagram.

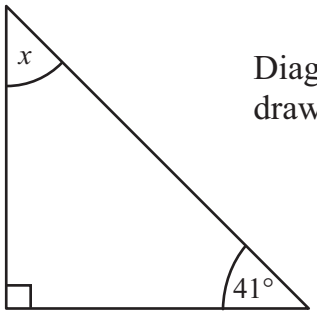


Diagram not drawn accurately

Answer x = _____° [2]

(b) The triangle ABC is isosceles with AB = AC.
Work out the size of the angle marked y in the diagram.

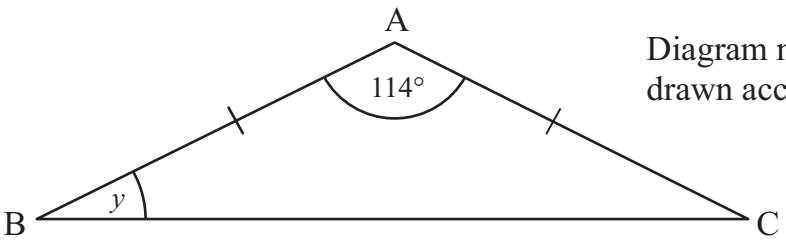


Diagram not drawn accurately

Answer y = _____° [2]

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4 Calculate

(a) $\frac{2}{5} \times \frac{1}{10}$

Give your answer in its simplest form.

Answer _____ [2]

(b) $\frac{13}{15} - \frac{2}{5}$

Answer _____ [2]

(c) $2^3 \times 6^2$

Answer _____ [2]

Examiner Only	
Marks	Remark

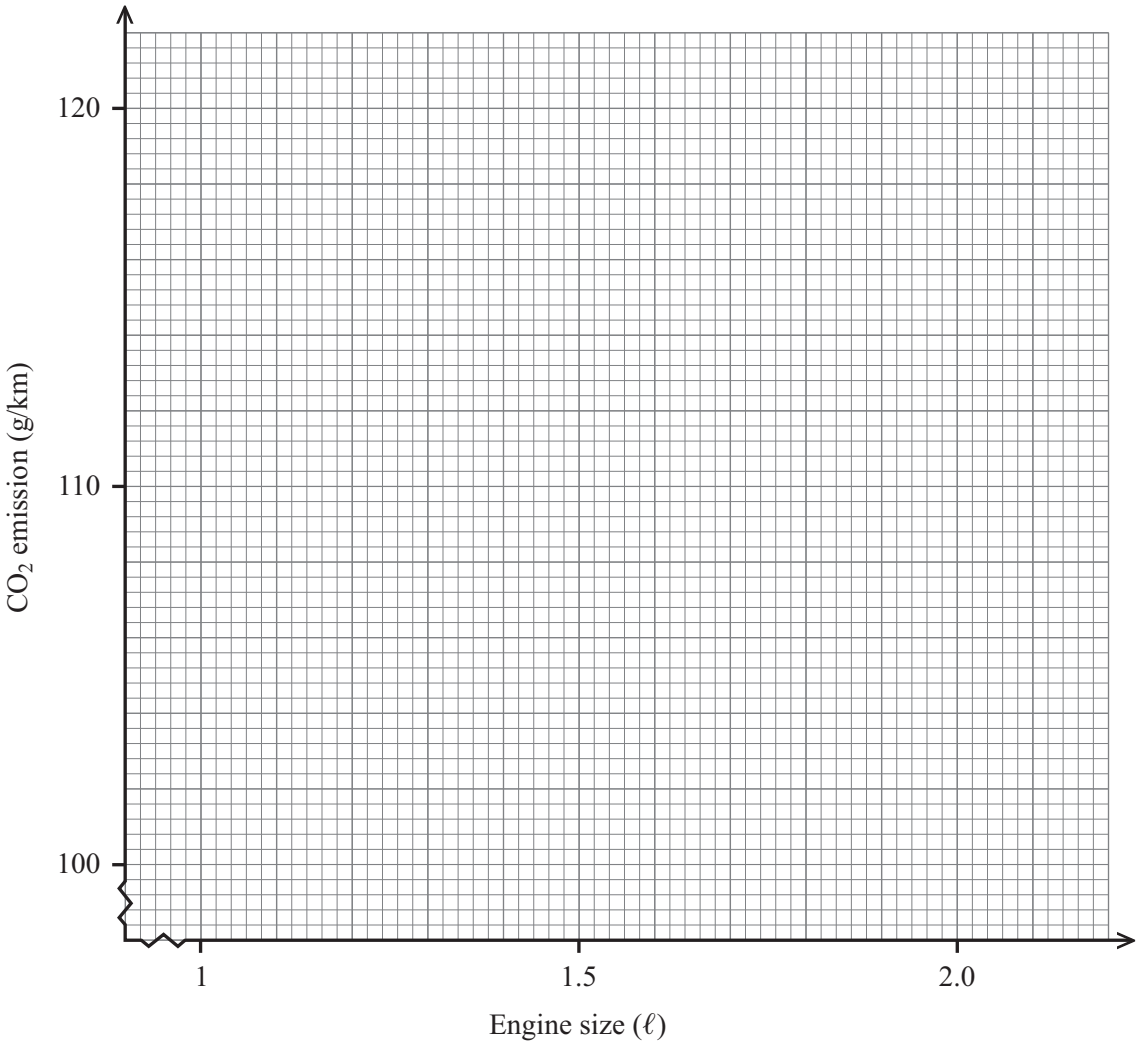
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Examiner Only	
Marks	Remark

5 **(a)** Seven cars were tested for their CO_2 emission value.
Draw a scatter diagram, plotting engine size against CO_2 emission.

Make	Model	Engine size (ℓ)	CO_2 emission (g/km)
Audi	A3	1.9	118
BMW	1 Series	2.0	120
Citroën	C1	1.4	109
Ford	Fiesta	1.4	110
Ford	Focus	1.6	115
Seat	Ibiza	1.4	100
Volkswagen	Golf	1.9	119

[2]



(b) One of the results appears to be different from the others. Which car is it?

_____ [1]

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(c) Use the rest of the results to draw a line of best fit. [1]

(d) Use your line of best fit to estimate the CO_2 emission value for a Fiat with engine size 1.3 l.

Answer _____ g/km [1]

Examiner Only	
Marks	Remark

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Examiner Only	
Marks	Remark

6 In a class are 18 girls and 12 boys.
Six of the girls wear glasses and three of the boys wear glasses.
What percentage of the class wear glasses?

Answer _____% [3]

---

7 **(a)** Write down the first three terms of the sequence where the nth term is $n^2 + 2$

Answer _____, _____, _____ [2]

(b) Find the nth term of the sequence

2, 6, 10, 14, 18, ...

Answer _____ [2]

(c) Factorise $10b + 15$

Answer _____ [1]

---

8 **(a)** Change 2.6 m^2 into cm^2.

Answer _____ cm^2 [2]

(b) A bag of coal weighs 14 kg, correct to the nearest kg.
Write down the smallest weight the bag of coal could be.

Answer _____ kg [1]

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9 **(a)** Calculate the LCM (lowest common multiple) of 54 and 60

Answer _____ [3]

(b) Calculate the HCF (highest common factor) of 54 and 60

Answer _____ [1]

---

10 Jason bought four apples at x pence each and four cans of cola at $2x$ pence each.
He got £1.28 change from £5
Write down an equation in terms of x and solve it to find the value of x.

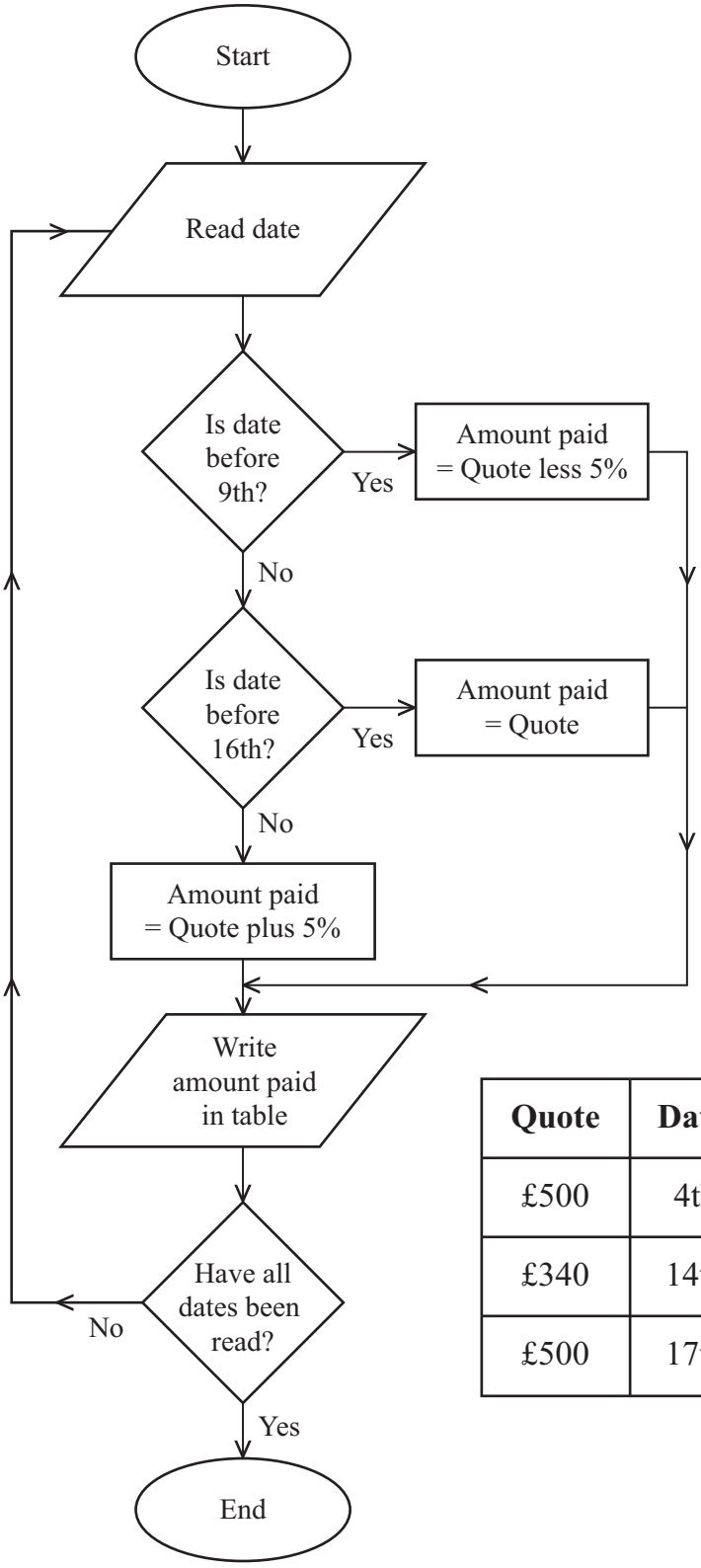
Answer _____ [4]

Examiner Only

Marks	Remark

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11 "OILCO" delivers heating oil to three customers on Monday 2 February. Each customer is quoted a price, but what they pay depends on the date they pay. Use the flow chart to complete the table.



Quote	Date	Amount paid
£500	4th	
£340	14th	
£500	17th	

[3]

Examiner Only

Marks	Remark

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THIS IS THE END OF THE QUESTION PAPER

GCSE

Mathematics (Modular)

Summer 2010

Mark Schemes

Issued: October 2010

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General Certificate of Secondary Education
2010

Mathematics

Module N2 Paper 1
(Non-calculator)
Foundation Tier

[GMN21]

TUESDAY 1 JUNE

9.15 am – 10.00 am

MARK SCHEME

STEMUP.CO.UK

GCSE MATHEMATICS 2010

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A later part of a question may require a candidate to use an answer obtained from an earlier part of the same question. A candidate who gets the wrong answer to the earlier part and goes on to the later part is naturally unaware that the wrong data is being used and is actually undertaking the solution of a parallel problem from the point at which the error occurred. If such a candidate continues to apply correct method, then the candidate's individual working must be **followed through** from the error. If no further errors are made, then the candidate is penalised only for the initial error. Solutions containing two or more working or transcription errors are treated in the same way. This process is usually referred to as "follow-through marking" and allows a candidate to gain credit for that part of a solution which follows a working or transcription error.

It should be noted that where an error trivialises a question, or changes the nature of the skills being tested, then as a general rule, it would be the case that not more than half the marks for that question or part of that question would be awarded; in some cases the error may be such that no marks would be awarded.

Positive marking:

It is our intention to reward candidates for any demonstration of relevant knowledge, skills or understanding. For this reason we adopt a policy of **following through** their answers, that is, having penalised a candidate for an error, we mark the succeeding parts of the question using the candidate's value or answers and award marks accordingly.

Some common examples of this occur in the following cases:

(a) a numerical error in one entry in a table of values might lead to several answers being incorrect, but these might not be essentially separate errors;

(b) readings taken from candidates' inaccurate graphs may not agree with the answers expected but might be consistent with the graphs drawn.

When the candidate misreads a question in such a way as to make the question easier only a proportion of the marks will be available (based on the professional judgement of the examiner).

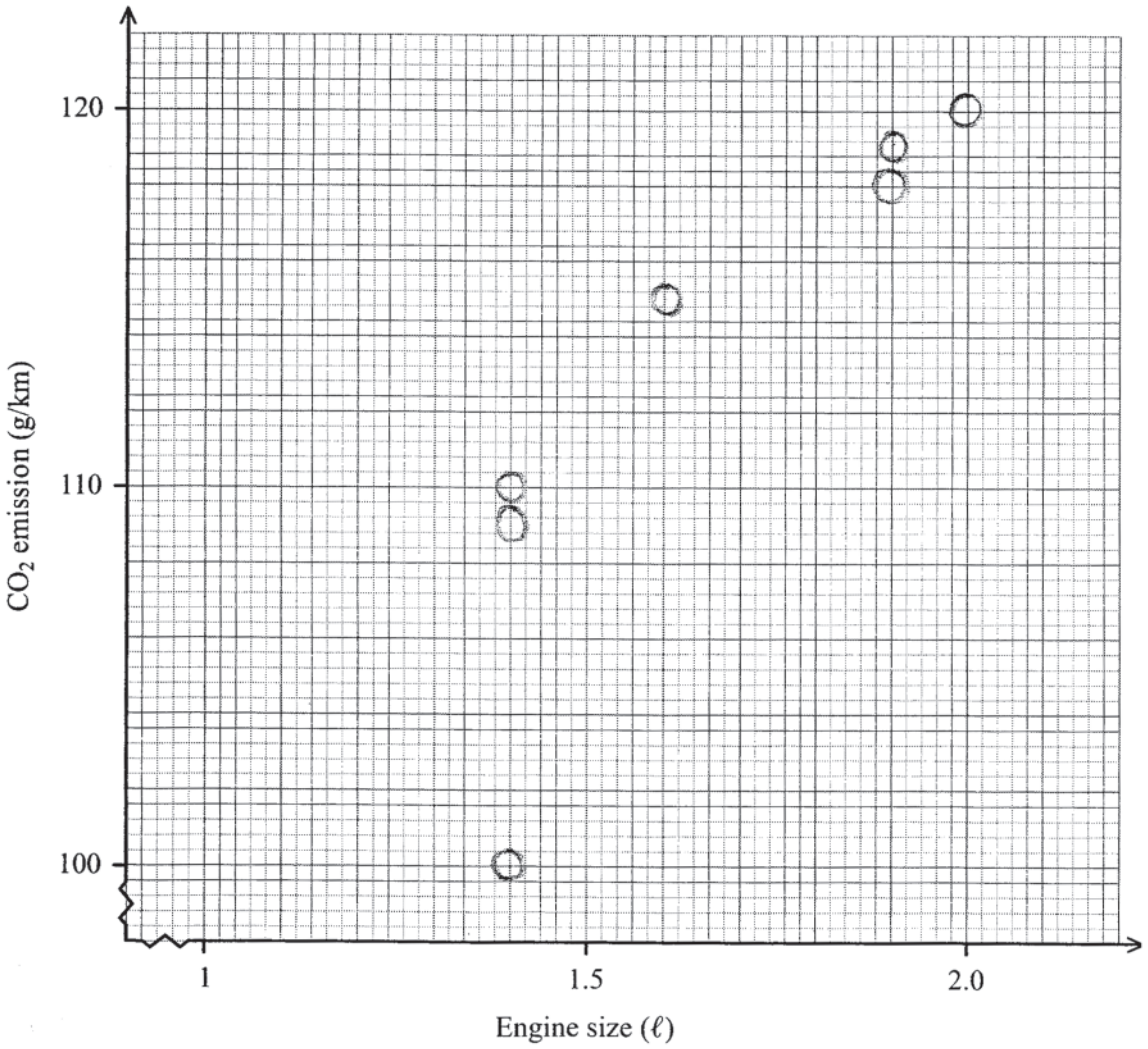
				AVAILABLE MARKS
1	**(a)**	Modal age = 33	A1	
	(b)	12	A1	
	(c)	6 ladies are above 41 years	MA1, MA1	4
2	**(a)**	$7x = 42$	MA1	
		$x = 6$	MA1	
	(b)	$x = 28$	MA1	3
3	**(a)**	$41 + 90 = 131$	MA1	
		$180 - 131 = 49$	MA1	
	(b)	$180 - 114 = 66$	MA1	
		$\frac{66}{2} = 33$	MA1	4
4	**(a)**	$\frac{2}{50}$	MA1	
		$= \frac{1}{25}$	A1	
	(b)	$\frac{13}{15} - \frac{6}{15}$	MA1	
		$= \frac{7}{15}$	A1	
	(c)	$8 \times 36 = 288$	MA2	
		(for one correct index value follow calculation to allow MA1)		6
5	**(a)**	See overlay 7 Points correct (4 Points – MA1)	MA2	
	(b)	Seat (Ibiza 1.4)	A1	
	(c)	Line drawn correctly	A1	
	(d)	Correct reading from line	MA1	5

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			AVAILABLE MARKS
6	$\frac{9}{30}$	MA1	
	$\frac{9}{30} \times 100$	M1	
	$= 30\%$	A1	3
7	**(a)** 3, 6, 11 (allow A1 for 2 correct)	A2	
	(b) $4n - 2$	MA1, A1	
	(c) $5\,(2b + 3)$	MA1	5
8	**(a)** $2.6 \times 100 \times 100$	MA1	
	$= 26000$	A1	
	(b) 13.5	A1	3
9	**(a)** $54 = 2 \times 3 \times 3 \times 3$	MA1	
	$60 = 2 \times 2 \times 3 \times 5$	MA1	
	LCM $= 2 \times 2 \times 3 \times 3 \times 3 \times 5 = 540$	MA1	
	(b) $2 \times 3 = 6$	MA1	4
10	$4x + 8x + 128 = 500$ (or equivalent)	M1, A1	
	$12x = 372$	MA1	
	$x = 31$	MA1	4
11	£475	MA1	
	£340	MA1	
	£525	MA1	3
		Total	**44**

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GCSE MATHEMATICS SUMMER 2010
MODULE N2-1
OVERLAY QUESTION 5



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Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
January 2010

Mathematics



Module N2 Paper 1
(Non-calculator)
Foundation Tier

[GMN21]

GMN21

TUESDAY 12 JANUARY

9.15 am – 10.00 am

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all eleven** questions.
Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.
You **must not** use a calculator for this paper.

INFORMATION FOR CANDIDATES

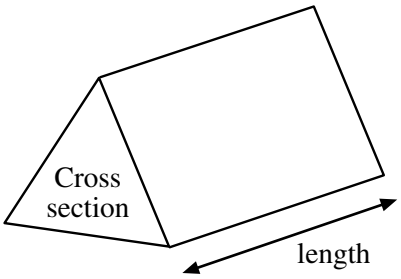
The total mark for this paper is 44.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a ruler, compasses, set-square and protractor.
The Formula Sheet is on page 2.

For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
Total Marks	

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Formula Sheet

Volume of prism = area of cross section × length



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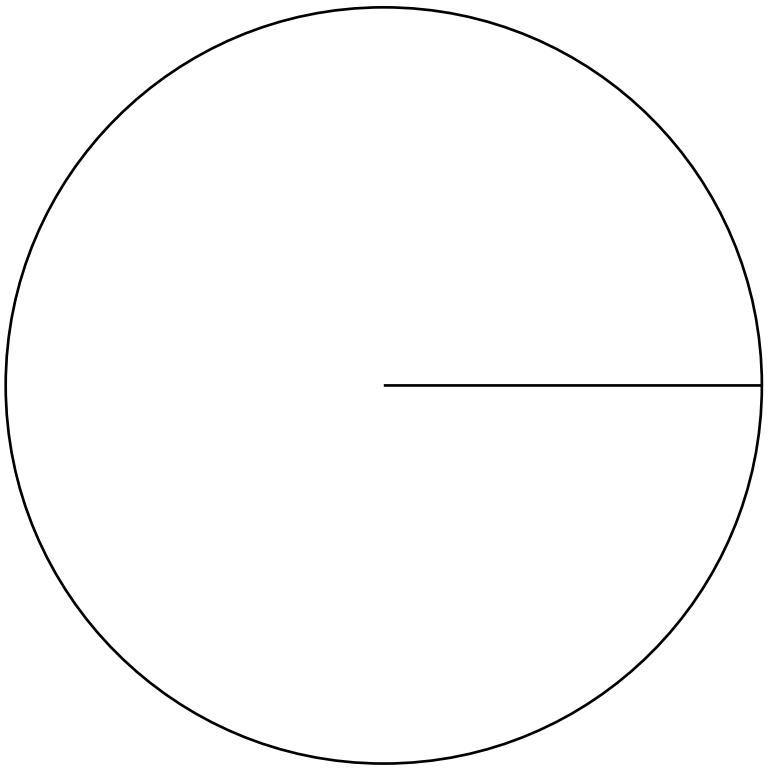
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Examiner Only	
Marks	Remark

1 **(a)** Year 10 pupils were asked the name of their mobile phone company. The results for the 120 pupils are shown in the table below.

Phone company	Number of pupils
In-tune	16
4-phones	48
Aweb	20
U Text	12
Other	24

Draw a pie chart to show the information in the table.



[4]

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(b) The stem and leaf diagram illustrates the reaction times of 24 students in an experiment.

Reaction times

1	1 2 5 5 7 8 9
2	0 0 0 3 4 5 6 8
3	3 4 8
4	7 9
5	1 1 9
6	4

Key: 6 | 4 = 6.4 seconds

(i) What time is the median?

Answer _____ seconds [1]

(ii) What is the range of times?

Answer _____ seconds [1]

Examiner Only	
Marks	Remark

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Examiner Only	
Marks	Remark

2 **(a)** Write down the next two prime numbers after 19

Answer _____ and _____ [2]

(b) Calculate $\frac{1}{3} \times \frac{2}{5}$

Answer _____ [1]

---

3 Calculate the size of angle x in the diagram.

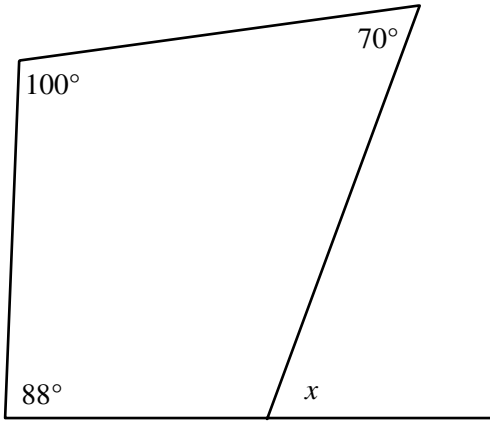


Diagram not drawn accurately

Answer _____ ° [3]

---

4 Solve $7x + 5 = 3x + 8$

Answer x = _____ [3]

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Examiner Only	
Marks	Remark

5 **(a)** Cars must take an MOT test when they are four years old.



Source: http://www.jasonjonesautovrmtre.co.uk/images/mot-centre.jpg

Of the cars that fail the test, $\frac{1}{3}$ of them fail on poor brakes, $\frac{1}{6}$ on bad lights and $\frac{1}{4}$ on worn tyres. The rest fail on poor steering.

What fraction fail on poor steering?

Answer _____ [3]

(b) $\frac{5}{8}$ of the length of a wall has been completed.

If there is still 30 ft to build, how long will the wall be when it is finished?



Source: http://www.goldtrowel.org/images/brickpics%20013.jpg

Answer _____ ft [3]

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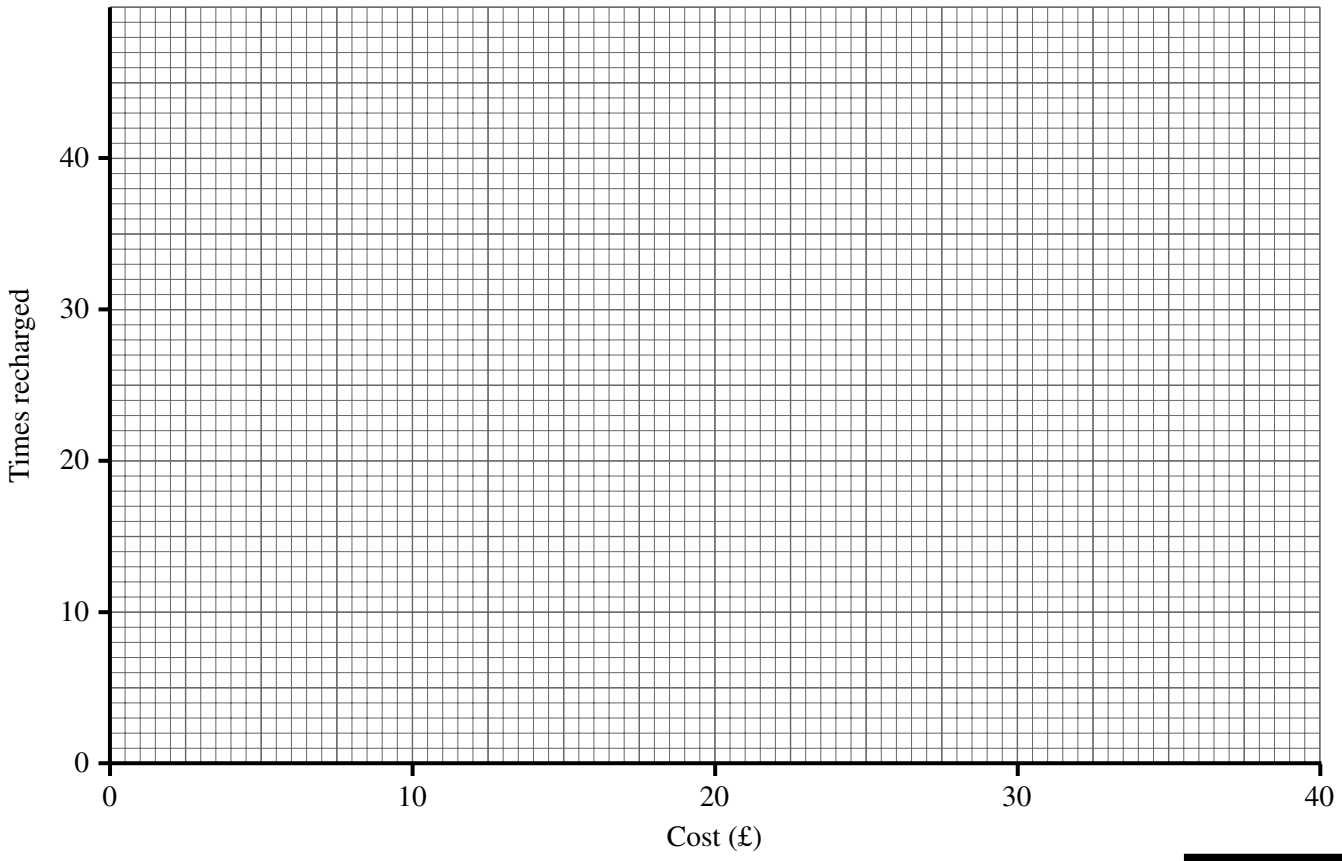
Examiner Only	
Marks	Remark

6 Seven friends compared the costs of their mobile phones and how many times they had to recharge them in a period of 2 months.

The table shows the results.

Cost (£)	17	19	21	23	25	27	30
Times recharged	38	31	28	24	20	16	8

(a) Draw a scatter graph for this data. [2]



Examiner Only	
Marks	Remark

(b) Draw a line of best fit on the scatter graph. [1]

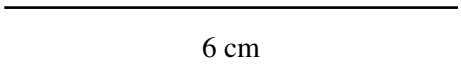
(c) Estimate the cost of another mobile phone which had to be recharged four times.

Answer £ _____ [1]

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7 A parallelogram has sides 6 cm and 5 cm. The shorter diagonal is 5 cm.

Make an **accurate** drawing of this parallelogram.
One side has been drawn for you.



[4]

Examiner Only	
Marks	Remark

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Examiner Only	
Marks	Remark

8 Simplify

(a) $7\ell - 3m + 4m - \ell$

Answer _____ [2]

(b) $\frac{3a}{2} + \frac{2a}{3}$

Answer _____ [3]

---

9 Jake asked a number of students in his year group how much they paid for their home computer.
The results are shown in the frequency table.

Price (£ *P*)	**Frequency**
$0 < P \leqslant 500$	5
$500 < P \leqslant 1000$	20
$1000 < P \leqslant 1500$	10
$1500 < P \leqslant 2000$	4
$2000 < P \leqslant 2500$	1

Calculate an estimate for the mean price.

Answer £ _____ [4]

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10 The interior angle of a regular polygon is 140°.
How many sides has this regular polygon?

Answer _____ [3]

11 Calculate $6\frac{3}{4} - 4\frac{1}{3}$

Answer _____ [3]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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1312-053-1

GCSE

Mathematics (Modular)

January 2010

Mark Schemes

Issued: April 2010

Rewarding Learning

General Certificate of Secondary Education
January 2010

Mathematics

Module N2 Paper 1
(Non-calculator)
Foundation Tier

[GMN21]

TUESDAY 12 JANUARY

9.15am – 10.00am

MARK SCHEME

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GCSE MATHEMATICS 2010

Introduction

The mark scheme normally provides the most popular solution to each question. Other solutions given by candidates are evaluated and credit given as appropriate; these alternative methods are not usually illustrated in the published mark scheme.

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The solution to a question gains marks for correct method and marks for an accurate working based on this method. Where the method is not correct no marks can be given.

A later part of a question may require a candidate to use an answer obtained from an earlier part of the same question. A candidate who gets the wrong answer to the earlier part and goes on to the later part is naturally unaware that the wrong data is being used and is actually undertaking the solution of a parallel problem from the point at which the error occurred. If such a candidate continues to apply correct method, then the candidate's individual working must be **followed through** from the error. If no further errors are made, then the candidate is penalised only for the initial error. Solutions containing two or more working or transcription errors are treated in the same way. This process is usually referred to as "follow-through marking" and allows a candidate to gain credit for that part of a solution which follows a working or transcription error.

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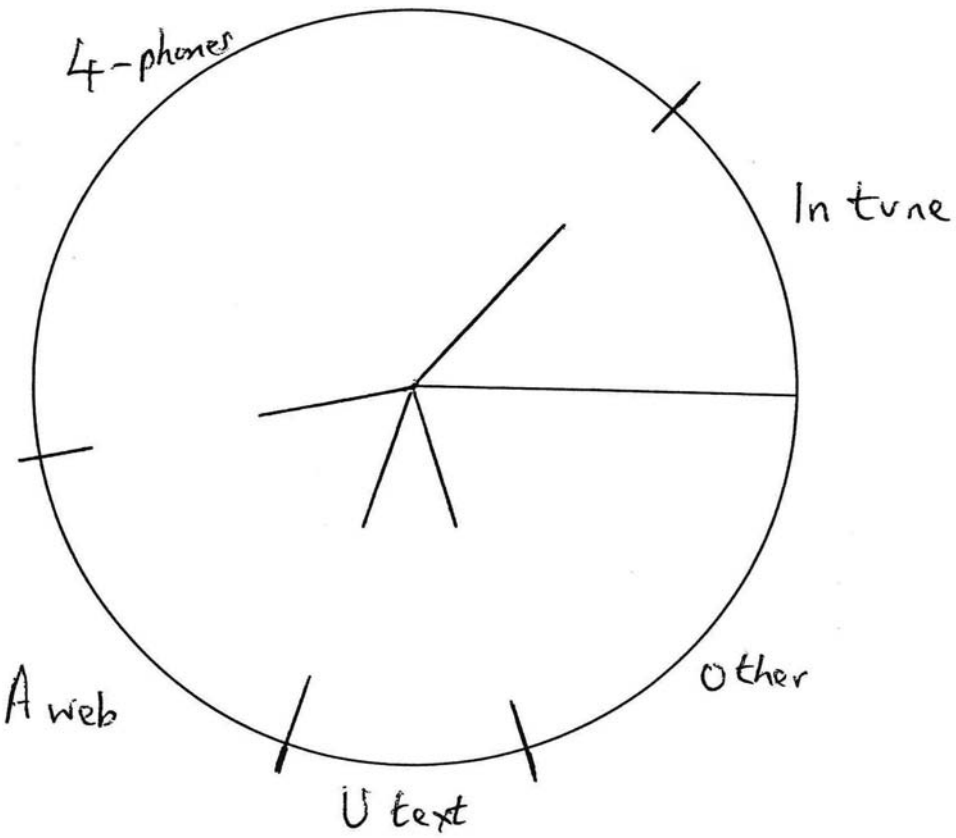
			AVAILABLE MARKS
1	**(a)** Angles 48° 144° 60° 36° 72°	M1, A1	
	Sectors	M1, A1	
	(b) **(i)** 2.45	A1	
	(ii) 5.3	A1	6
2	**(a)** 23 and 29	A2	
	(b) $\frac{2}{15}$	A1	3
3	$360 - (100 + 88 + 70) = 102$	M1, A1	
	$180 - 102 = 78$	MA1	3
4	$7x - 3x = 8 - 5$	MA1	
	$4x = 3$	MA1	
	$x = \frac{3}{4}$	A1	3
5	**(a)** $\frac{4}{12} + \frac{2}{12} + \frac{3}{12} = \frac{9}{12}$	M1, A1	
	$1 - \frac{9}{12} = \frac{3}{12}$ $(\frac{1}{4})$	MA1	
	(b) $\frac{3}{8} = 30$ ft	MA1	
	$\frac{1}{8} = 10$ ft	MA1	
	Wall length $= 10 \times 8 = 80$	MA1	6
6	**(a)** 7 points correct (A1 for 4 correct)	A2	
	(b) Appropriate line	MA1	
	(c) Correct reading from candidate's line	MA1	4

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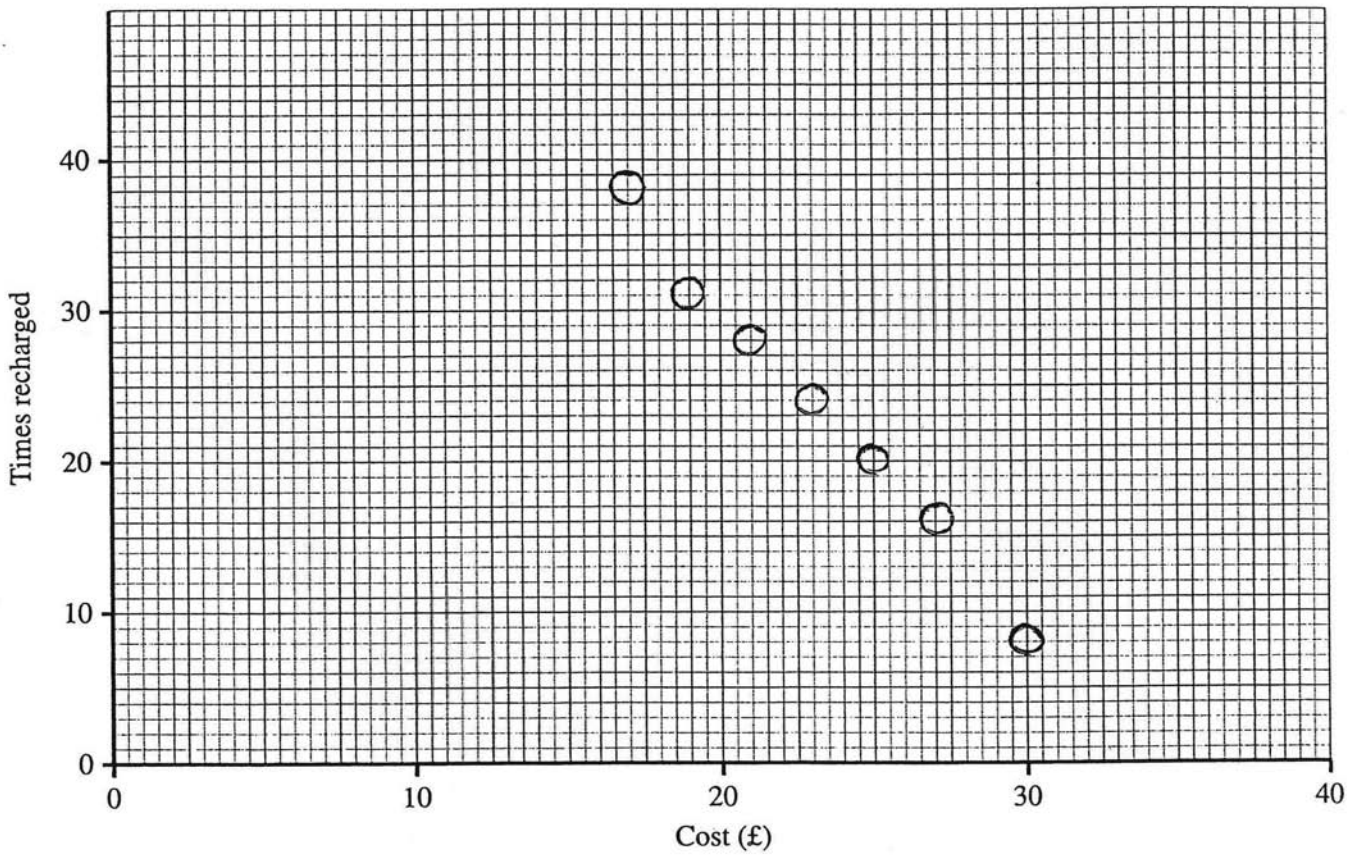
			AVAILABLE MARKS
7	Accurate diagonal Correct parallelogram	A1 A3	4
8	**(a)** 6, + m	MA1, MA1	
	(b) $\frac{9a}{6} + \frac{4a}{6}$	MA1, MA1	
	$= \frac{13a}{6}$	MA1	5
9	$250 \times 5 + 750 \times 20 + 1250 \times 10 + 1750 \times 4 + 2250 \times 1$	M1	
	$= 38\,000$	A1	
	$38\,000 \div 40$	M1	
	$= 950$	A1	4
10	40°	MA1	
	$360 \div 40 = 9$	M1, A1	3
11	$\frac{27}{4} - \frac{13}{3}$ **or** $2\frac{3}{4} - \frac{1}{3}$	MA1	
	$\frac{81}{12} - \frac{52}{12}$ **or** $2\frac{9}{12} - \frac{4}{12}$	MA1	
	$\frac{29}{12}$ $(2\frac{5}{12})$ **or** $2\frac{5}{12}$	A1	3
		Total	**44**

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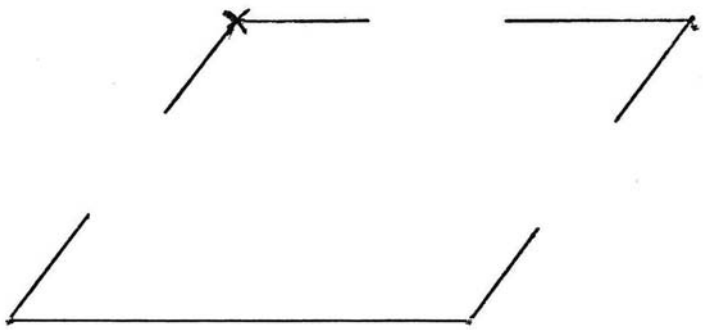
GCSE MATHEMATICS JANUARY 2010
MODULE N2-1
OVERLAY QUESTION 1



GCSE MATHEMATICS JANUARY 2010
MODULE N2-1
OVERLAY QUESTION 6



GCSE MATHEMATICS JANUARY 2010
MODULE N2-1
OVERLAY QUESTION 7



Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2009

Mathematics



Module N2 Paper 1
(Non-calculator)
Foundation Tier

[GMN21]

MONDAY 18 MAY

1.30 pm – 2.15 pm

GMN21

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all thirteen** questions.
Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.
You **must not** use a calculator for this paper.

INFORMATION FOR CANDIDATES

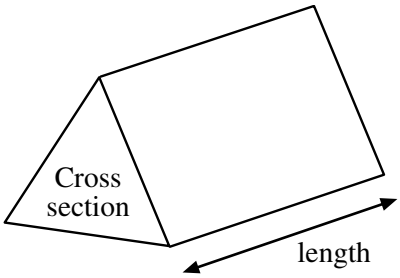
The total mark for this paper is 44.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a ruler, compasses, set-square and protractor.
The Formula Sheet is on page 2.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
Total Marks	

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Formula Sheet

Volume of prism = area of cross section × length



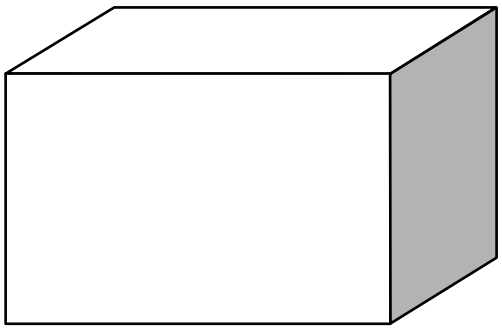
Examiner Only	
Marks	Remark

1 Write down the next two terms in the sequence

12, 11, 9, 6, ..., ...

Answer _____ , _____ [2]

2



A cuboid has volume 120 cm^3.
The length of the cuboid is 8 cm. The breadth is 5 cm.
Find the height of the cuboid.

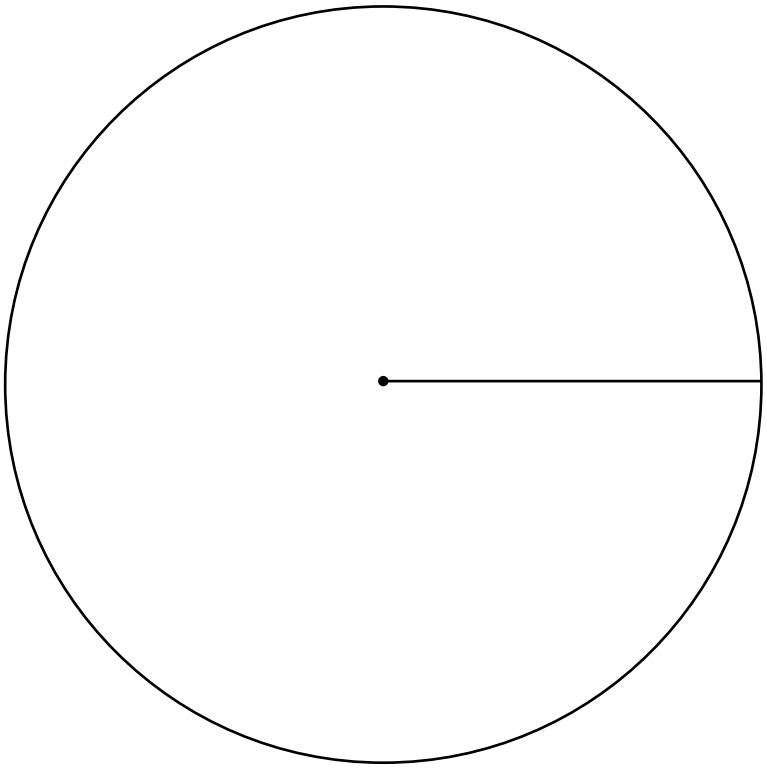
Answer _____cm [2]

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3 During a short period the colours of cars passing a school were noted. The results were as follows:

Blue	15
Green	10
White	9
Black	5
Red	21

Draw a pie chart to illustrate this information.



[4]

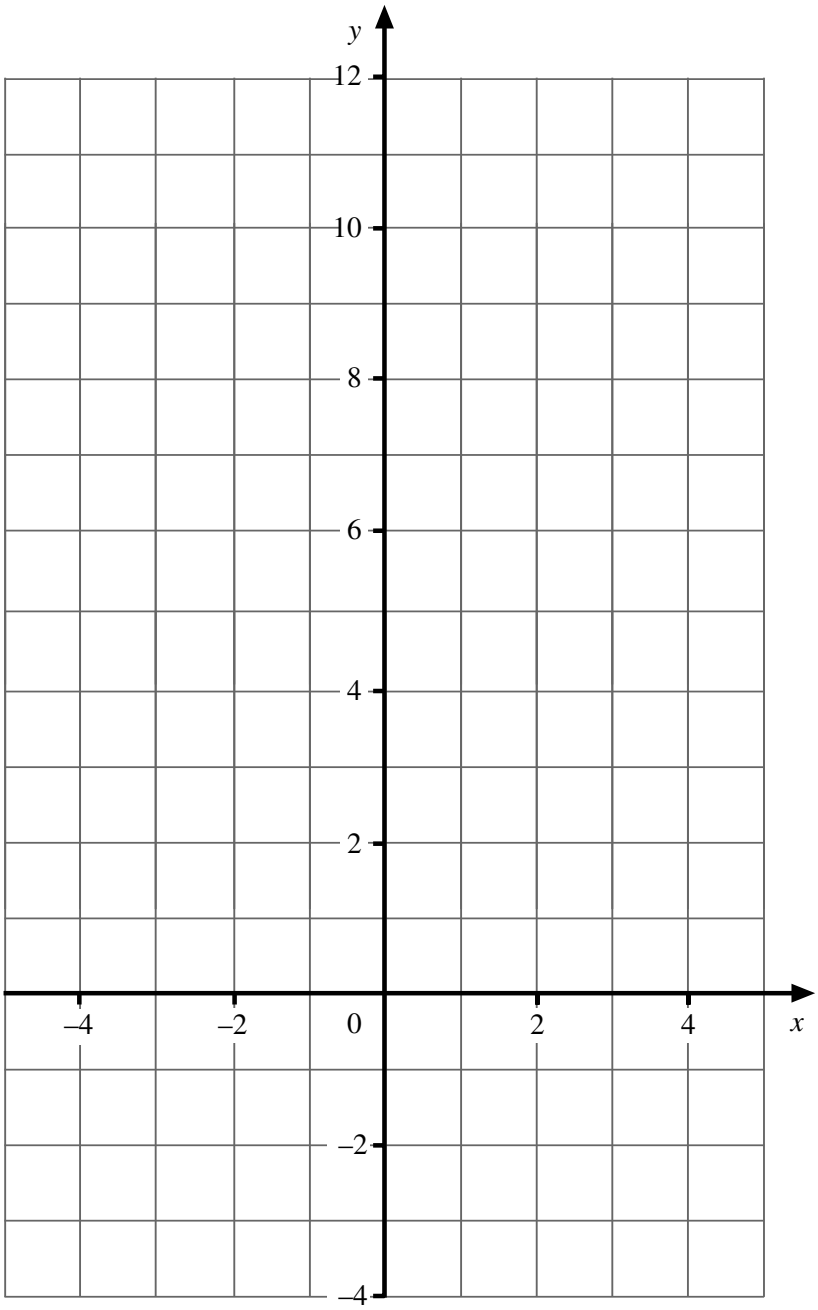
Examiner Only	
Marks	Remark

4 **(a)** Complete the table for $y = 3x - 1$

x	–1	1	3	4
$y = 3x - 1$		2	8	11

[1]

(b) Hence draw the graph of $y = 3x - 1$



[2]

Examiner Only

Marks	Remark

5 Calculate

Examiner Only	
Marks	Remark

(a) $5^2 \times 2^3$

Answer _____ [2]

(b) 0.2×0.4

Answer _____ [1]

(c) $4.7 - 1.93$

Answer _____ [1]

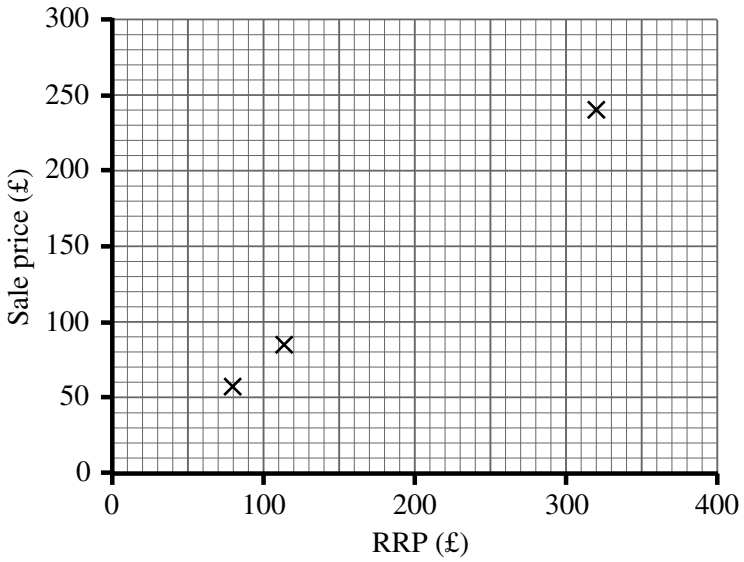
(d) $\frac{7}{12} - \frac{1}{6}$

Answer _____ [2]

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6 The table shows the RRP (recommended retail price) and the sale price of some products in Jack's Discount Store.

RRP (£)	**80**	**113**	140	170	180	210	230	270	300	**320**
Sale price (£)	**58**	**85**	105	130	132	155	178	200	232	**240**



The data in bold type has already been plotted.

(a) Complete the scatter graph. [2]

(b) Draw a line of best fit. [1]

(c) Estimate the RRP of a product on sale for £150.

Answer £ _____ [1]

(d) What type of correlation does your graph show?

Answer _____ [1]

Examiner Only

Marks	Remark

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7 **(a)** Factorise $p^2 + 7p$

Answer _____ [1]

(b) The nth term of a sequence is $n^2 - 3$
Which term of the sequence will equal 78?

Answer _____ [2]

Examiner Only	
Marks	Remark

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8

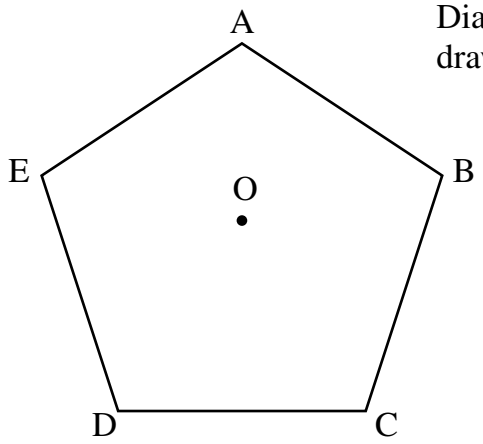


Diagram not drawn accurately

ABCDE is a regular pentagon with centre O.

Calculate the size of

(a) angle AOB

Answer _____° [2]

(b) angle ABC

Answer _____° [2]

9 On holiday Mark drinks 3/4 of a bottle of water each day.
What is the least number of bottles Mark will have to buy for a 9 day holiday?

Answer _____ [3]

Examiner Only

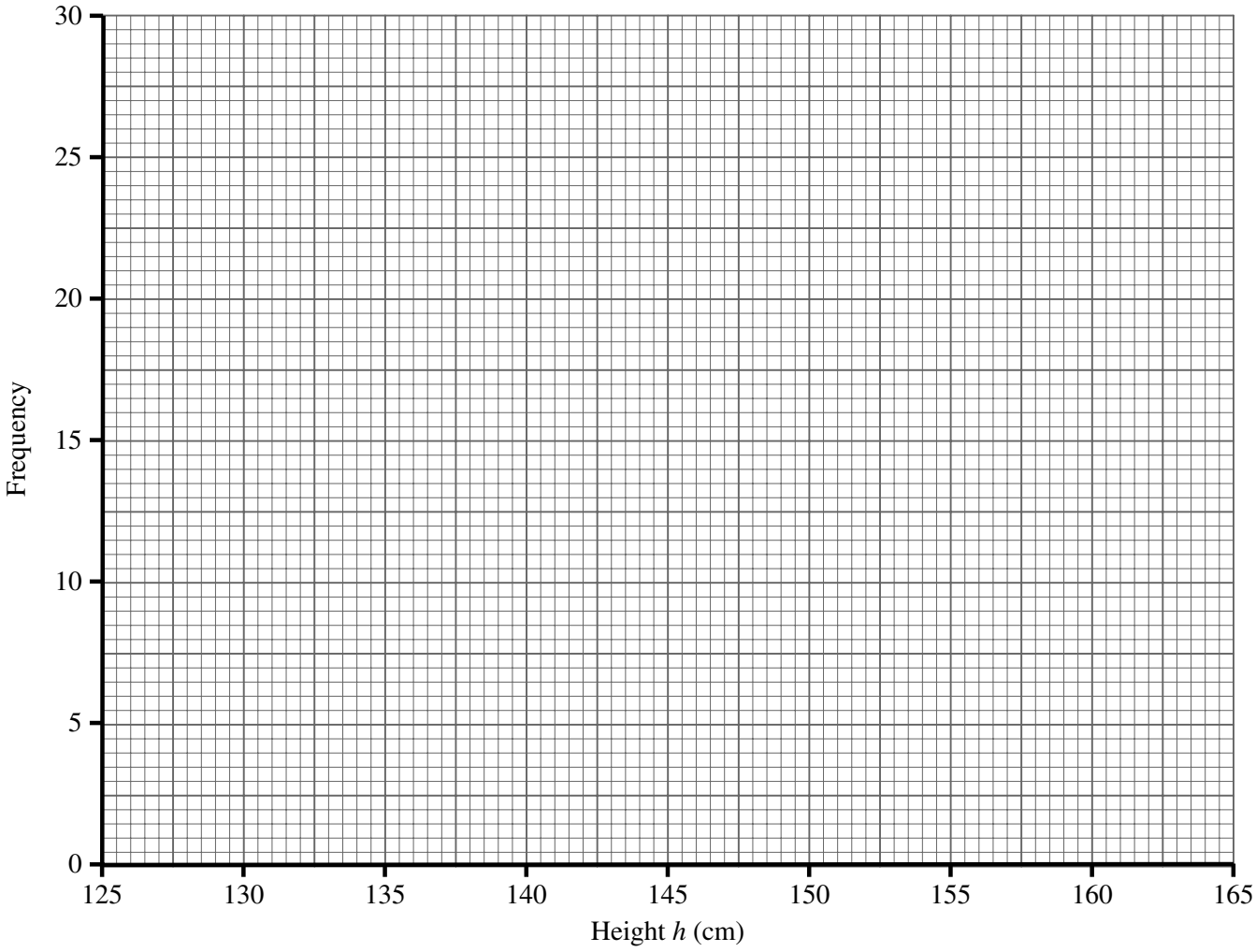
Marks	Remark

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10 The heights of 100 students were recorded.

Height, h, in cm	Frequency
$130 \leqslant h < 135$	15
$135 \leqslant h < 140$	25
$140 \leqslant h < 145$	26
$145 \leqslant h < 150$	21
$150 \leqslant h < 155$	8
$155 \leqslant h < 160$	5

Draw a frequency polygon for the data.



[2]

Examiner Only	
Marks	Remark

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11 Write 80 as a product of its prime factors giving your answer in index form.

Answer _____ [3]

Examiner Only	
Marks	Remark

12 Ben is x years old. His brother Dan is 5 years younger.
In 3 years' time the sum of their ages will be 15.

(a) Write an equation in terms of x using the sum of their ages in 3 years' time.

Answer _____ [2]

(b) Solve the equation to find Ben's age now.

Answer _____ [1]

13 The percentage marks in a class test were recorded in the following table:

Marks (%)	Frequency		
55–59	1		
60–64	1		
65–69	2		
70–74	5		
75–79	9		
80–84	5		
85–89	2		

Calculate an estimate for the mean mark.

Answer _____% [4]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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GCSE

Mathematics (Modular)

Summer 2009

Mark Schemes

Issued: October 2009

Rewarding Learning

General Certificate of Secondary Education

Summer 2009

Mathematics

Module N2 Paper 1

(Non-calculator)

Foundation Tier

[GMN21]

MONDAY 18 MAY

1.30 pm – 2.15 pm

MARK SCHEME

STEMUP.CO.UK

GCSE MATHEMATICS 2009

Introduction

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When the candidate misreads a question in such a way as to make the question easier only a proportion of the marks will be available (based on the professional judgement of the examiner).

			AVAILABLE MARKS
1	2, –3	A1, A1	2
2	$120/(8 \times 5) = 3$	M1, A1	2
3	See overlay 90°, 60°, 54°, 30°, 126° (award one mark for evidence of $\frac{360}{60}$ or 6) All sectors correct and labelled	 A2 A2	 4
4	**(a)** –4	A1	
	(b) graph	M1, A1	3
5	**(a)** 25×8 $= 200$	MA1 A 1	
	(b) 0.08	MA1	
	(c) 2.77	MA1	
	(d) $\frac{7}{12} - \frac{2}{12}$	MA1	
	$= \frac{5}{12}$	A1	6
6	**(a)** Scatter graph allow A1 for 4 correct	A2	
	(b) oblique line with roughly half the points on either side	A1	
	(c) follow line	A1	
	(d) positive	A1	5
7	**(a)** $p(p + 7)$	MA1	
	(b) $n^2 - 3 = 78$ $n^2 = 81$ $n = 9$	M1 A1	 3

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			AVAILABLE MARKS
8	**(a)** AOB = 360/5 = 72	M1, A1	
	(b) ABC = 180 – 72 = 108	M1, A1	4
9	$\frac{3}{4} \times 9$	MA1	
	$= \frac{27}{4} = 6\frac{3}{4}$	MA1	
	= 7 bottles	A1	3
10	Polygon, see overlay		
	Correct frequencies at mid-points	MA1	
	Points joined by straight lines	MA1	2
11	2 | 80 2 | 40 2 | 20 2 | 10 5 | 5 1	M1 A1	
	$= 2^4 \times 5$	MA1	3
12	**(a)** Now: Jack = x Dan = $x - 5$	A1	
	3 years time $x + 3 + x - 5 + 3 = 15$ (or equivalent)	MA1	
	(b) $x = 7$	A1	3

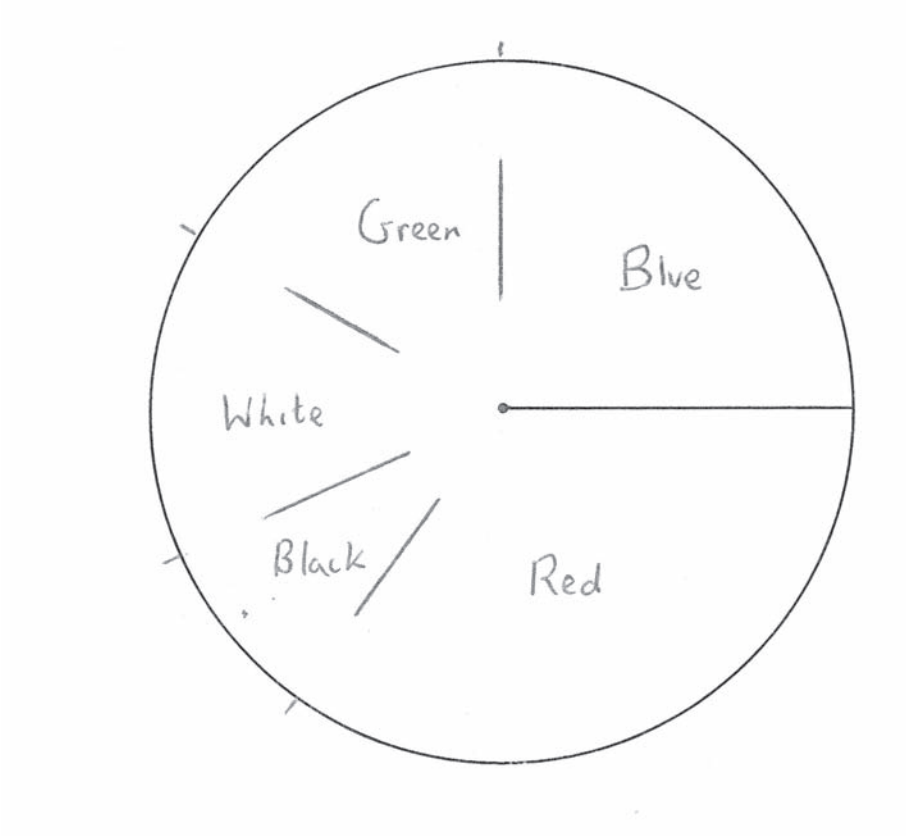
13

Mid-Points	fx
57	57
62	62
67	134
72	360
77	693
82	410
87	174

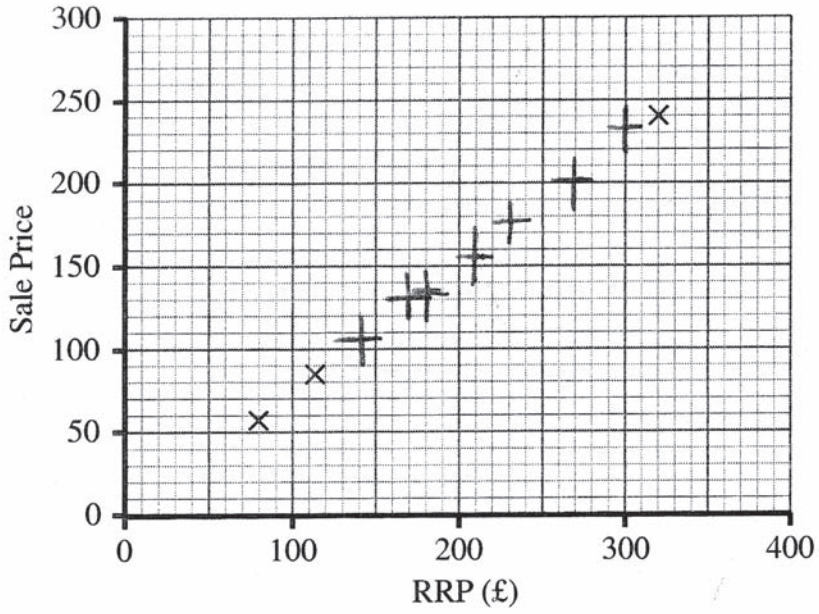
Mid-points	MA1	
fx products	M1	
1890	MA1	
75.6	MA1	4
	Total	**44**

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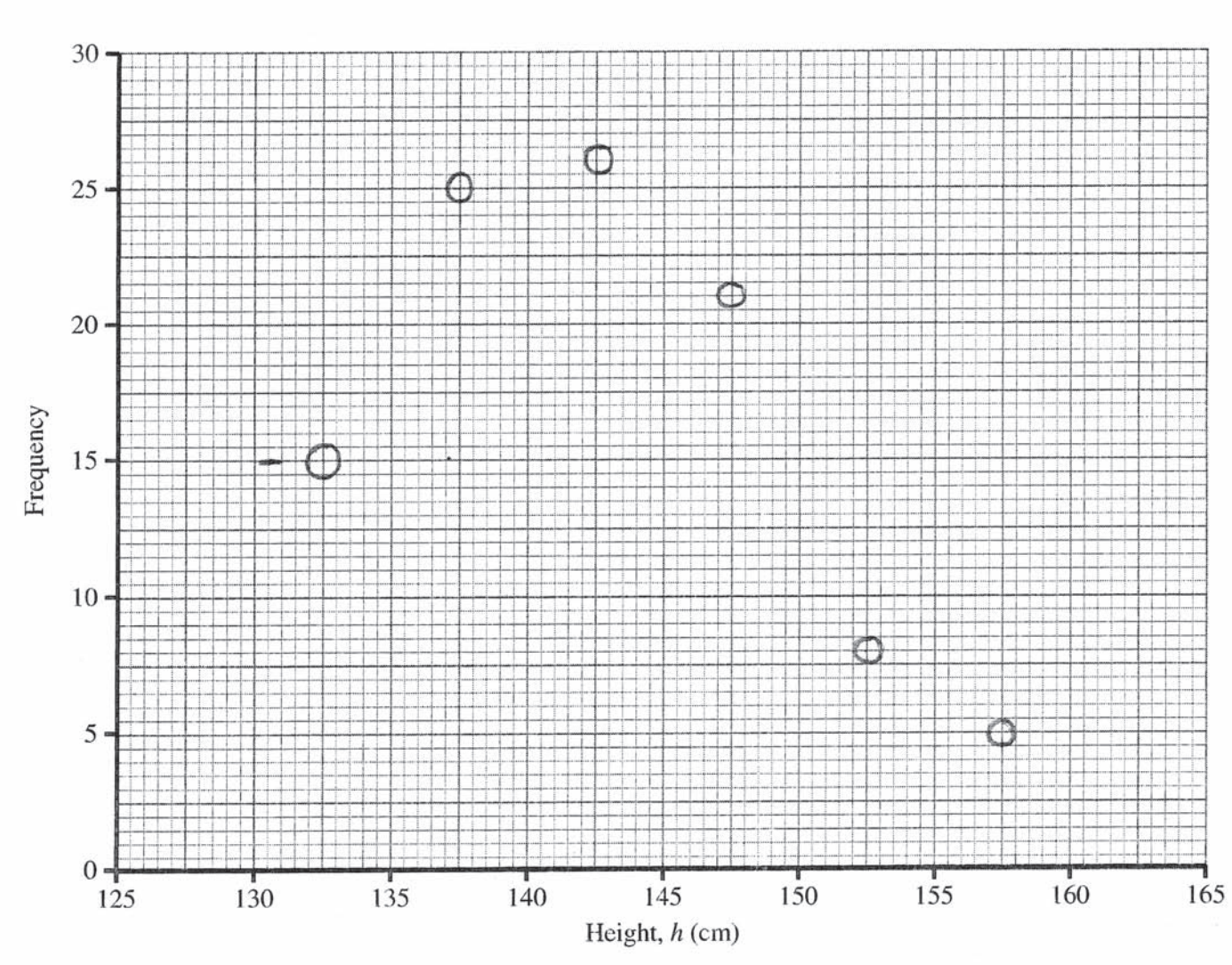
GCSE MATHEMATICS SUMMER 2009
MODULE N2-1
OVERLAY QUESTION 3



GCSE MATHEMATICS SUMMER 2009
MODULE N2-1
OVERLAY QUESTION 6



GCSE MATHEMATICS SUMMER 2009
MODULE N2-1
OVERLAY QUESTION 10



Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
January 2009

Mathematics



Module N2 Paper 1
(Non-calculator)
Foundation Tier

[GMN21]

GMN21

FRIDAY 9 JANUARY

9.15 am – 10.00 am

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all twelve** questions.
Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.
You **must not** use a calculator for this paper.

INFORMATION FOR CANDIDATES

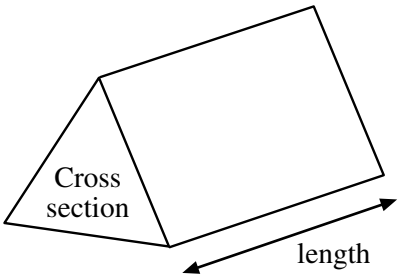
The total mark for this paper is 44.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a ruler, compasses, set-square and protractor.
The Formula Sheet is on page 2.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Total Marks	

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Formula Sheet

Volume of prism = area of cross section × length



1 Calculate

Examiner Only	
Marks	Remark

(a) 0.5×0.3

Answer _____ [1]

(b) $\frac{3}{8} - \frac{1}{4}$

Answer _____ [2]

(c) $6.2 - 2.73$

Answer _____ [1]

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2 The stem and leaf diagram represents the heights of 21 students in a year 8 class.

Stem	Leaf
13	6 9
14	1 2 3 3 4
14	5 6 7 7 8 8 9
15	1 2 4 4
15	5 8
16	2

Key: 13 | 6 means 136 cm

Write down

(a) the range of the data,

Answer _____ cm [1]

(b) the median of the data.

Answer _____ cm [1]

Examiner Only	
Marks	Remark

3 Construct the triangle ABC with AB = 7 cm, BC = 4 cm and AC = 5 cm.
Do not rub out your construction lines.

[3]

4 In Maggie's corner shop 0.8 kg carrots and 0.5 kg onions cost £1.94
Carrots cost £1.55 per kg.
How much do onions cost per kg?

Answer £ _____ [4]

Examiner Only	
Marks	Remark

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Examiner Only	
Marks	Remark

5 **(a)** Calculate the perimeter of a rectangle with length 6.5 cm and breadth 2.5 cm.

Answer _____ cm [1]

(b)

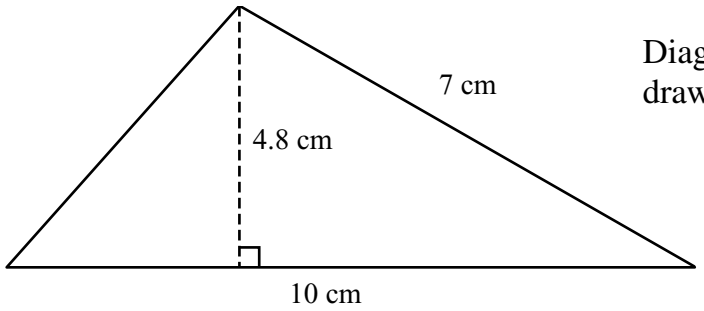


Diagram not drawn accurately

Calculate the area of the triangle.

Answer _____ [3]

(c) A bag of coal weighs 32 kg, correct to the nearest kilogram.
What is the least possible weight of the bag of coal?

Answer _____ kg [1]

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6 Joe uses $\frac{3}{4}$ of a tin of paint to paint a garden shed.
What is the least number of tins required to paint 10 similar sheds?

Answer _____ [3]

Examiner Only	
Marks	Remark

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Examiner Only	
Marks	Remark

7 A survey was carried out in Belfast City centre to find out the opinions of people on the subject of 'healthy living'.

A sample of 100 people were questioned.

(a) (i) Explain why these 100 people might not represent the opinions of the Belfast public on 'healthy living'.

_____

_____ [1]

(ii) One of the questions used in the survey was "Do you not think that thin people are healthier than fat people?"
Give a reason why this question may not have been a suitable question for the survey.

Reason _____

_____ [1]

(b) The same survey was carried out inside a leisure centre in Lisburn.
Give **two** reasons why the survey should not have been carried out in this location.

Reason _____

_____ [1]

Reason _____

_____ [1]

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Examiner Only	
Marks	Remark

8 **(a)** Find the value of $5x - 2y$ when $x = -2$ and $y = 4$

Answer _____ [2]

(b) Solve $\frac{y}{3} = 6$

Answer _____ [1]

(c) Expand $p(4 - p^2)$

Answer _____ [2]

---

9 Convert 600 000 cm^3 into m^3.

Answer _____ m^3 [2]

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Examiner Only	
Marks	Remark

10 **(a)** Factorise

(i) $28 - 7y$

Answer _____ [1]

(ii) $p - pt$

Answer _____ [1]

(b) **(i)** Expand $5(3 - y)$

Answer _____ [1]

(ii) Expand and simplify $(x - 3)(x + 1)$

Answer _____ [2]

(c) Write down an expression for the nth term of the sequence

–4, –8, –12, –16, ...

Answer _____ [1]

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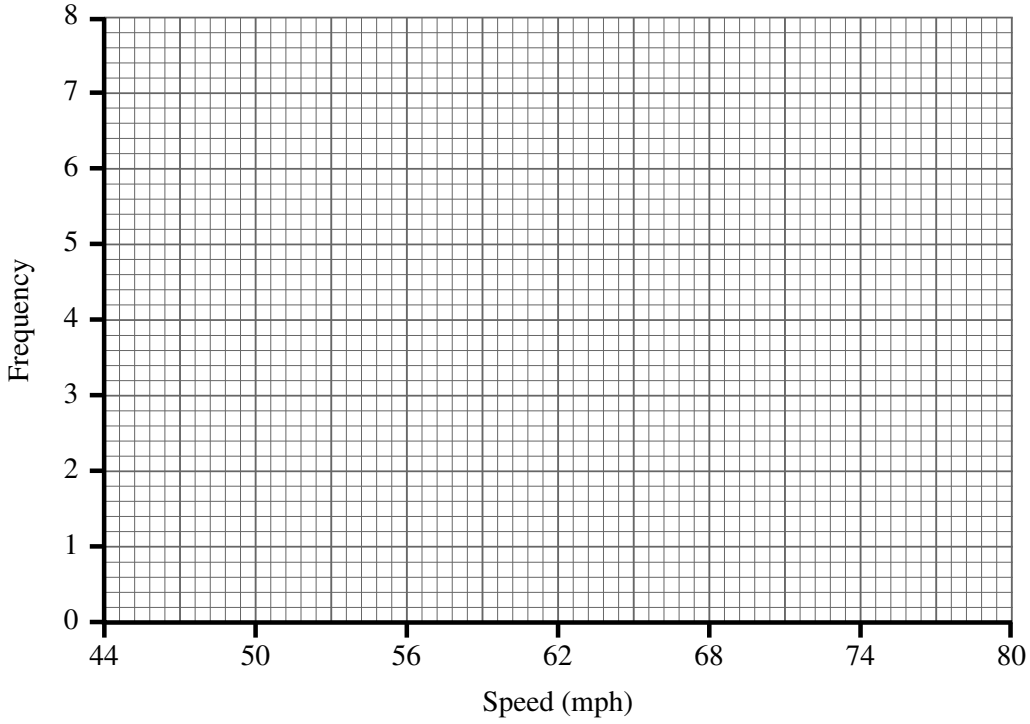
11 The PSNI recorded the speeds of a number of vehicles passing under a bridge on the M2 motorway during a 2 minute period one morning. The speeds recorded are in miles per hour (mph).

Speed x (mph)	Frequency f
$44 \leqslant x < 50$	3
$50 \leqslant x < 56$	7
$56 \leqslant x < 62$	8
$62 \leqslant x < 68$	6
$68 \leqslant x < 74$	5
$74 \leqslant x < 80$	1

(a) Which of the class intervals contains the median speed?

Answer _____ [1]

(b) On the graph paper draw a frequency polygon for the data. [2]



Examiner Only

Marks	Remark

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12 Write 120 as a product of prime factors and express your answer in index notation.

Examiner Only	
Marks	Remark

Answer _____ [3]

THIS IS THE END OF THE QUESTION PAPER

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GCSE

Mathematics (Modular)

January 2009

Mark Schemes

Issued: April 2009

Rewarding Learning

General Certificate of Secondary Education

January 2009

Mathematics

Module N2 Paper 1

(Non-calculator)

Foundation Tier

[GMN21]

FRIDAY 9 JANUARY

9.15 am – 10.15 am

MARK SCHEME

STEMUP.CO.UK

GCSE MATHEMATICS JANUARY 2009

Introduction

The mark scheme normally provides the most popular solution to each question. Other solutions given by candidates are evaluated and credit given as appropriate; these alternative methods are not usually illustrated in the published mark scheme.

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1	**(a)** 0.15	A1	
	(b) $\frac{3}{8} - \frac{2}{8} = \frac{1}{8}$	A2	
	(c) 3.47	A1	4
2	**(a)** 162 – 136 = 26	MA1	
	(b) 147	MA1	2
3	MA1 for each correct side	MA3	3
4	0.8 × 1.55 = £1.24	MA1	
	£1.94 – £1.24 = £0.70 or 70p	MA1	
	£0.70 ÷ 0.5 = £1.40 **or** £0.70 × 2 = £1.40	M1, A1	4
5	**(a)** 18 cm	MA1	
	(b) $\frac{1}{2}(4.8) \times 10$	M1	
	$= 24\,\text{cm}^2$	A1 A1 (units)	
	(c) 31.5	A1	5
6	$10 \times \frac{3}{4} = \frac{30}{4} = 7.5$	M1, A1	
	$= 8$	MA1	3
7	**(a)** **(i)** age, sex, not members of Belfast public, suitable reason	MA1	
	(ii) leading question, depends on age, shape etc., suitable reason	MA1	
	(b) users of leisure centres committed to healthy lifestyle unlikely to survey older people or other suitable reasons (no repeats from part **(a)**)	MA2	4
8	**(a)** 5(–2) – 2(4)		
	= –10 – 8	M1	
	= –18	A1	
	(b) 18	A1	
	(c) $4p - p^3$	A1, A1	5

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			AVAILABLE MARKS
9	$\div 100^3$	MA1	
	$0.6\,m^3$	A1	2
10	**(a)** **(i)** $7(4 - y)$	A1	
	(ii) $p(1 - t)$	A1	
	(b) **(i)** $15 - 5y$	A1	
	(ii) $x^2 + x - 3x - 3$	MA1	
	$x^2 - 2x - 3$	A1	
	(c) $-4n$	A1	6
11	**(a)** $56 \leqslant x < 62$	MA1	
	(b) correct points	A1	
	correct lines	A1	3
12	2 | 120		
	2 | 60		
	2 | 30		
	3 | 15		
	5 | 5		
	1	M1, A1	
	2^3 3 5	A1	3
		Total	**44**

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