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GCSE Maths

GCSE Mathematics Specimen papers and mark schemes

Edexcel GCSE in Mathematics (Linear) (2540)

Edexcel GCSE in Mathematics (Modular) (2544)

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GCSE in Mathematics A
(Linear) 2540

Sample Assessment Material and Mark Schemes

Centre No.						Paper Reference								Surname	Initial(s)
Candidate No.											/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Paper 1 (Non-Calculator)

Foundation Tier

Specimen paper

Time: 1 hour and 30 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions in the spaces provided in this question paper.
If you need more space to complete your answer to any question, use additional answer sheets.
You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 26 questions in this question paper. The total mark for this paper is 100.
There are 24 pages in this question paper. Any blank pages are indicated.
Calculators must not be used.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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Turn over

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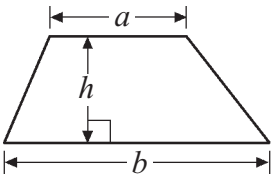
GCSE Mathematics

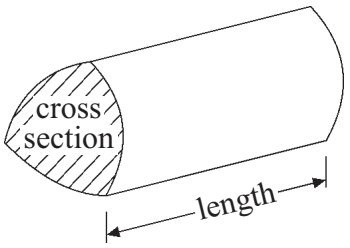
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



Leave blank

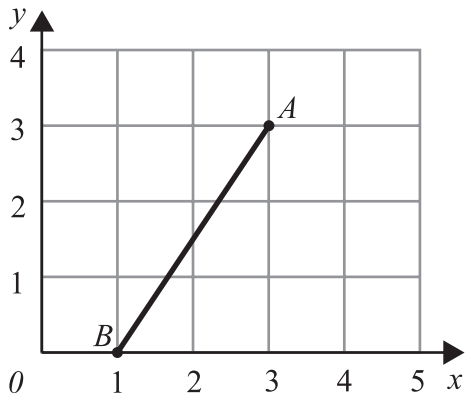
Answer ALL TWENTY SIX questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator

1.



(a) Write down the coordinates of the point

(i) A,

(…….. , ……..)

(ii) B.

(…….. , ……..)

(2)

(b) On the grid, mark with a cross (×) the midpoint of the line AB.

(1)

Q1

(Total 3 marks)

2. Here are the first five terms of a number sequence.

290 284 278 272 266

Write down the next two terms of the number sequence.

…… , ……

Q2

(Total 1 mark)

Leave blank

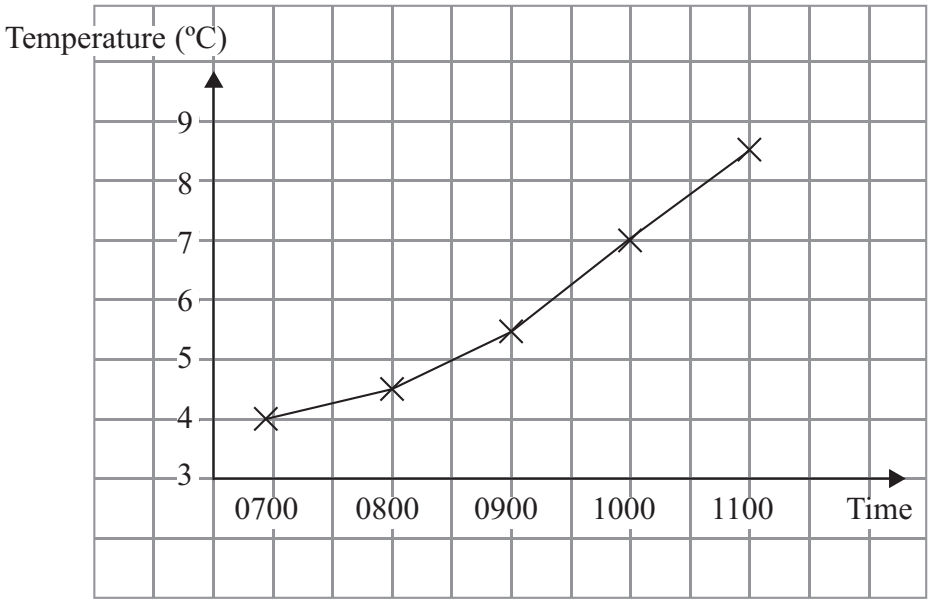
3. The table shows the temperature at midday on each day of a week during winter.

Day	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Temperature ºC	6	8	6	7	8	8	7

(a) Work out the median temperature.

.....ºC
(2)

The graph shows the temperature from 0700 to 1100 during one day.



(b) What was the temperature at 1000?

.....ºC
(1)

(c) What was the temperature at 0800?

.....ºC
(1)

Q3

(Total 4 marks)

Leave blank

4. A gardener planted some bulbs in October.
The following year the bulbs grew into flowers.
The table shows the months in which each type of bulb grew into flowers.

		Month					
		Jan	Feb	March	April	May	June
Type of bulb	Alliums				✓	✓	✓
	Crocuses	✓	✓	✓			
	Daffodils		✓	✓	✓		
	Irises	✓	✓				
	Tulips		✓	✓	✓		

(a) In which months do crocus bulbs grow into flowers?

.....

(1)

(b) Which type of bulb grows into flowers in June?

.....

(1)

(c) In which months does only **one** type of bulb grow into flowers?

.....

(1)

(d) Which type of bulb grows into flowers in the same months as the tulip bulb?

.....

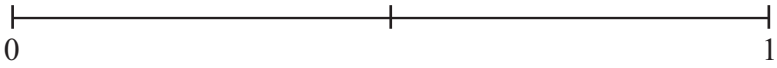
(1)

Ben puts one of each type of bulb in a bag.
He takes a bulb from the bag without looking.

(e) (i) Write down the probability that he will take a daffodil bulb.

.....

(ii) On the probability scale, mark with a cross (×) the probability that he will take a bulb that grows into a flower in March.



Q4

(2)

(Total 6 marks)

Leave blank

5. (a) Write the number **thirteen thousand, five hundred and ninety-one** in figures.

.....
(1)

(b) Write down the value of the 7 in the number 547 682

.....
(1)

(c) Write the number 8183 correct to the nearest hundred.

.....
(1)

Q5

(Total 3 marks)

6. (a) Complete the table by writing a sensible metric unit on each dotted line.
The first one has been done for you.

The distance from London to Manchester	222 kilometres
The volume of coffee in a mug	310 .....
The height of a door	215 .....
The weight of a one pound coin	12 .....

(3)

(b) Change 8 kilometres to metres.

.....m
(1)

Q6

(Total 4 marks)

Leave blank

7. Here is a list of 8 numbers.

9 10 25 32 49 55 69 80

(a) Write down **two** numbers from the list with a sum of 57

..... , ...

(1)

(b) Write down a number from the list which is

(i) a multiple of 8,

.....

(ii) a square number.

.....

(2)

cube	multiple	factor	product

(c) Use a word from the box to complete this sentence correctly.

10 is a ……..…… of 80

(1)

Here are 8 numbers.

88 82 69 68

36 18 16 11

(d) From these numbers, write down a number which has

(i) exactly **one** line of symmetry,

.....

(ii) 2 lines of symmetry **and** rotational symmetry of order 2,

.....

(iii) rotational symmetry of order 2 but **no** lines of symmetry.

.....

(3)

(Total 7 marks)

Q7

Leave blank

8. Work out 437 × 24

.....

(Total 3 marks)

Q8

Leave blank

9. The table can be used to convert euros (€) to pounds (£).

Euros (€)	Pounds (£)
0.10	0.08
0.20	0.16
0.50	0.40
1	0.80
2	1.60
3	2.40
4	3.20

(a) Change €2 to pounds.

£.....
(1)

(b) Change €3.50 to pounds.

£.....
(2)

(Total 3 marks)

Q9

10. Write these numbers in order of size.
Start with the smallest number.

(a) 91 109 17 140 83

.....
(1)

(b) −4 4 1 −8 −2

.....
(1)

(c) 70% $\frac{3}{4}$ 0.6 $\frac{2}{3}$

.....
(2)

(Total 4 marks)

Q10

Leave blank

11.

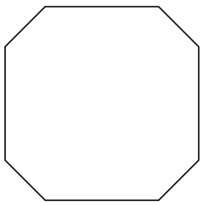


Diagram **NOT** accurately drawn

The diagram shows a shape.
The shape is an 8-sided polygon.

(a) Write down the mathematical name for an 8-sided polygon.

……..……..

(1)

The diagram below shows how four of the shapes fit round a square.

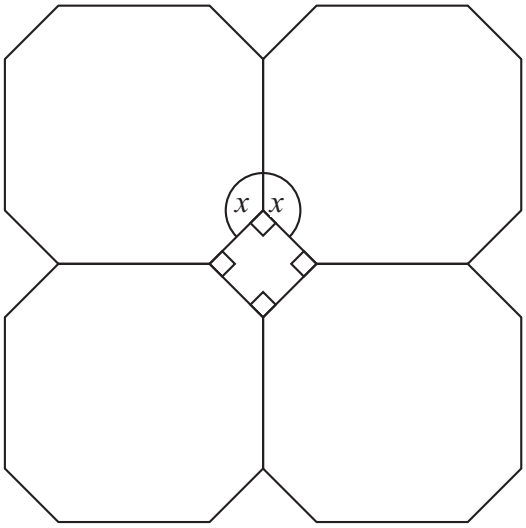


Diagram **NOT** accurately drawn

The size of each of the angles marked x is 135°

(b) Give reasons why.

.....

.....

.....

(2)

Leave blank

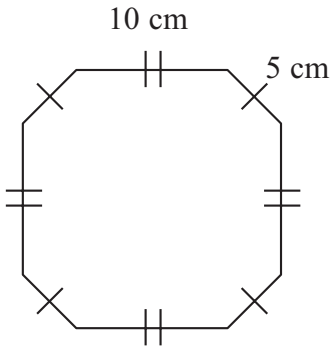


Diagram **NOT** accurately drawn

The diagram shows the lengths of two of the sides of the shape.

(c) Work out the perimeter of the shape.

.....cm

(2)

Q11

(Total 5 marks)

Leave blank

12. (a) Write 87% as a decimal.

.....
(2)

(b) Write $\frac{2}{5}$ as a percentage.

.....%
(1)

(c) Write 60% as a fraction.
Give your fraction in its simplest form.

.....
(1)

(d) Write $5\frac{1}{2}$ million in figures.

.....
(1)

(e) 55% of the students in a school are female.
What percentage of students are male?

.....%
(1)

Q12

(Total 6 marks)

Leave blank

13. Tina made a coach journey.
Her coach should have arrived at 15 50
It arrived 1 hour 20 minutes late.

(a) At what time did her coach arrive?

.....
(1)

The coach company has some vouchers to give to its customers.
The company uses this rule to work out the value of the vouchers to give to each customer.

Find $\frac{1}{10}$ of the amount spent
Then round **up** this answer to the next whole number of pounds

Bob spent £83.40

(b) (i) Work out $\frac{1}{10}$ of £83.40

£.....

(ii) Round up your answer to part (i) to the next whole number of pounds.

£.....
(3)

(Total 4 marks)

Q13

Leave blank

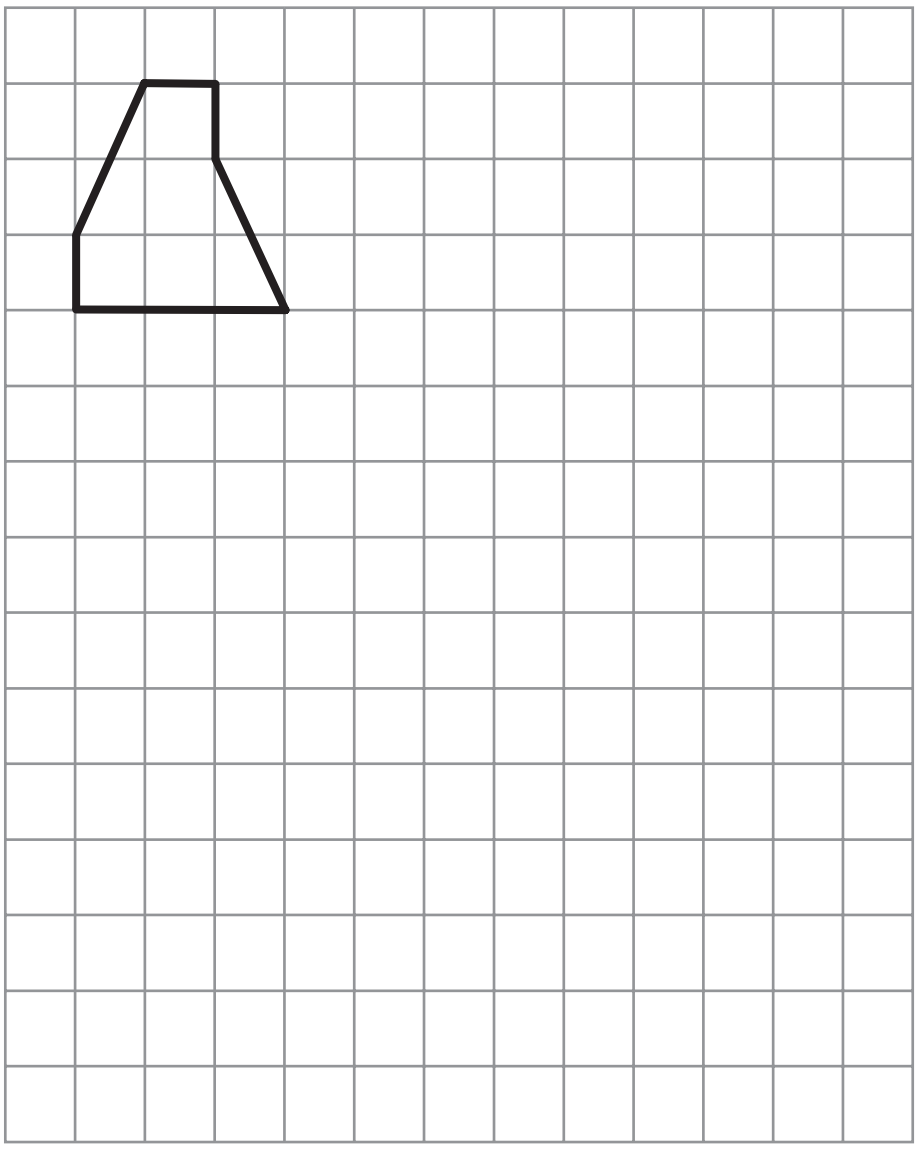
14. A shape has been drawn on a grid of one centimetre squares.

(a) Work out the area of the shape.

..... cm^2

(2)

(b) On the grid, enlarge the shape with a scale factor of 2.



(2) **Q14**

(Total 4 marks)

Leave blank

15. 80 students each play in one of three mixed sports teams.
The two-way table shows some information about these students.

	Football	**Cricket**	**Hockey**	**Total**
Female		6		36
Male	23			44
Total	36	19		80

Complete the two-way table.

(Total 2 marks)

Q15

16. (a) Simplify $8p+5q-3p+2q$

.....

(2)

(b) Simplify $5x+8y-2x-3y$

.....

(2)

(c) Simplify $5w^2-2w^2$

.....

(1)

(Total 5 marks)

Q16

Leave blank

17. Work out $80 \times \frac{4}{5}$

.....

(Total 2 marks)

Q17

18. The diagram shows a 6-sided shape, *ABCDEF*.
All the sides of the shape are equal in length.

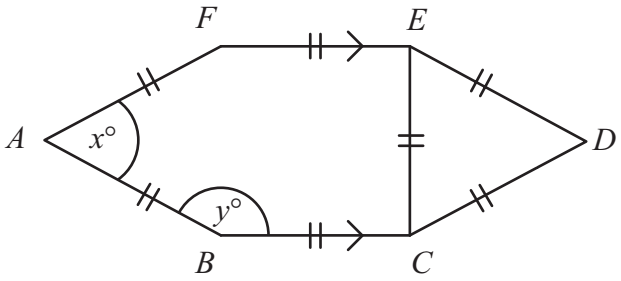


Diagram **NOT** accurately drawn

(a) (i) Find the value of *x*.

x = ...

(ii) Give a reason for your answer.

.....

(2)

(b) Work out the value of *y*.

y = ...

(2)

(Total 4 marks)

Q18

Leave blank

19. This rule can be used to work out the cost, in pounds, of buying time on a satellite link.

Add 3 to the number of hours of time bought.
Multiply your answer by 1000

(a) Work out the cost of buying 4 hours of satellite time.

£.....
(2)

Julian bought some satellite time.
The cost was £12 000

(b) Work out the number of hours of satellite time that Julian bought.

.....hours
(2)

The cost of buying n hours of satellite time is C pounds.

(c) Write down a formula for C in terms of n.

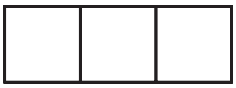
.....
(3)
(Total 7 marks)

Q19

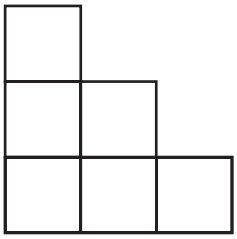
Leave blank

20. Here are the plan, front elevation and side elevation of a 3-D shape.

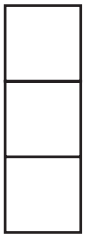
plan



front elevation



side elevation



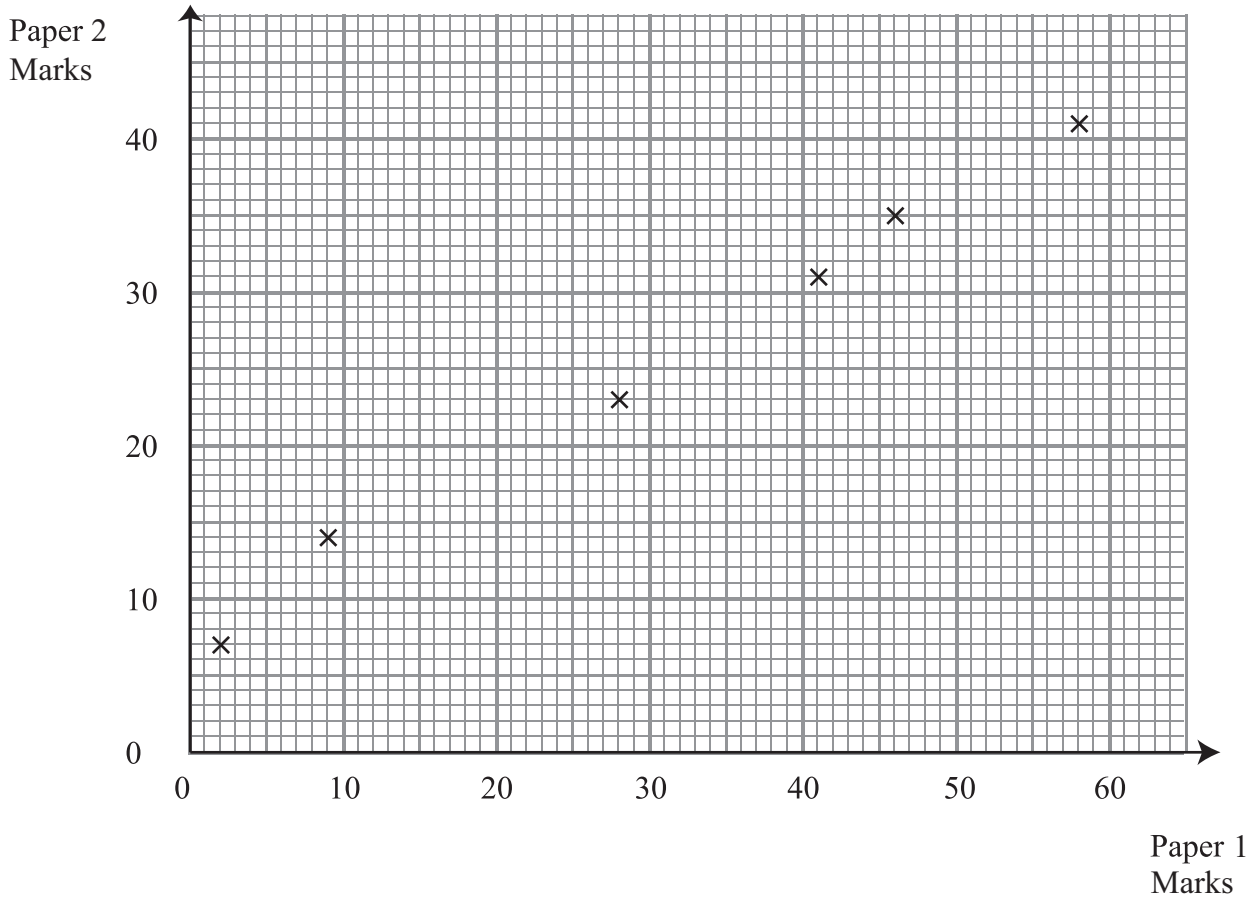
In the space below, draw a sketch of the 3-D shape.

Q20

(Total 2 marks)

Leave blank

21. The scatter graph shows some information about the marks of six students.
It shows each student's mark on Paper 1 and their mark on Paper 2.



The table shows the marks on Paper 1 and Paper 2 for two more students, A and B.

	Student A	Student B
Paper 1 mark	20	50
Paper 2 mark	20	35

(a) On the scatter graph, plot the information from the table.

(1)

(b) Describe the **correlation** between the marks on Paper 1 and the marks on Paper 2.

.....

(1)

(c) Draw a line of best fit on the diagram.

(1)

Another student has a mark of 30 on Paper 2.

(d) Use your line of best fit to estimate the mark on Paper 1 for this student.

.....

(1)

(Total 4 marks)

Q21

Leave blank

22. Here are the ingredients needed to make 1000 ml of custard.

Custard

makes 1000 ml

800 ml of milk
6 large egg yolks
100 g sugar
4 teaspoons of cornflour

(a) Work out the amount of sugar needed to make 2500 ml of custard.

.....g
(2)

(b) Work out the amount of milk needed to make 1500 ml of custard.

.....ml
(2)

Q22

(Total 4 marks)

Leave blank

23. Tony wants to collect information about the amount of homework the students in his class get.

Design a suitable question he could use.

You should include response boxes.

Q23

(Total 2 marks)

Leave blank

24. Write as a power of 7

(i) $7^3 \times 7^4$

.....

(ii) $7^{11} \div 7^5$

.....

Q24

(Total 2 marks)

25. (a) Solve $9 - 2x = 3(x + 2)$

$x =$ .....

(3)

(b) $-3 \leqslant y < 2$

y is an integer.

Write down all the possible values of y.

.....

(2)

Q25

(Total 5 marks)

Leave blank

26.

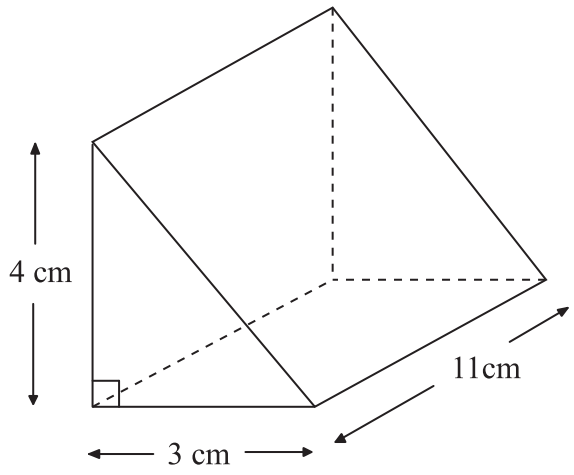


Diagram **NOT** accurately drawn

Work out the volume of the triangular prism.
Give the units with your answer.

.....

Q26

(Total 4 marks)

TOTAL FOR PAPER: 100 MARKS

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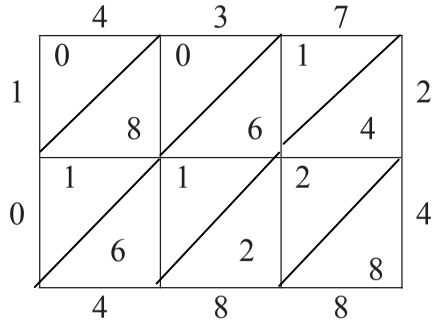
Questions	Working	Answer	Mark	Notes
1 (a) (i)		(3, 3)	**1**	B1 cao
(ii)		(1, 0)	**1**	B1 cao
(b)		Midpoint marked at $(2, 1\frac{1}{2})$	**1**	B1 allow 2 mm tolerance from $(2, 1\frac{1}{2})$
2		260, 254	**1**	A1 cao
3 (a)		7	**2**	M1 Ordering: 6677888 A1 cao
(b)		7	**1**	B1 cao
(c)		4.5	**1**	B1 Accept 4.3 – 4.7
4 (a)		Jan, Feb, Mar	**1**	B1 cao
(b)		Allium	**1**	B1 cao
(c)		May and June	**1**	B1 cao
(d)		Daffodil	**1**	B1 cao
(e) (i)		$\frac{1}{5}$	**1**	B1 for $\frac{1}{5}$ oe
(ii)		X marked on line at $\frac{3}{5}$	**1**	B1 for cross between $\frac{1}{2}$ and $\frac{3}{4}$
5 (a)		13 591	**1**	B1 cao
(b)		Thousands , 1000, 7000	**1**	B1 cao
(c)		8200	**1**	B1 cao

GCSE MATHEMATICS
MARK SCHEME – Specimen paper (Linear) Foundation Paper 1

Questions			Working	Answer	Mark	Notes
6	(a)			millilitres, m*l*, cm^3 cc centimetres, cm grams, g	3	B1 oe B1 oe B1 oe
	(b)			8000	1	B1 oe
7	(a)			25, 32	1	B1 for both
	(b)	(i)		32 or 80	2	B1 accept both
		(ii)		9, 25 or 49		B1 accept any amount of correct answers
	(c)			factor	1	B1 Could be indicated in the box.
	(d)	(i)		18	3	B1 cao
		(ii)		11 or 88		B1 accept both
		(iii		69		B1 cao

Questions	Working	Answer	Mark	Notes
8	437 24 1748 8740 10488 or 24 437 168 720 9600 10488 or  	10488	**3**	M2 for complete method, allow one arithmetic error (M1 for complete method, allow two arithmetic errors) A1 cao
9 (a)		1.60	**1**	B1 cao, could be indicated on the diagram
(b)	2.40 + 0.40	2.80	**2**	M1 2.40 + 0.40 or 0.08 × 35 or 0.80 × 3.5 oe valid method A1 cao SC B1 for 280, with or without working

GCSE MATHEMATICS
MARK SCHEME – Specimen paper (Linear) Foundation Paper 1

Questions	Working	Answer	Mark	Notes
10 (a)		17, 83, 91, 109, 140	**1**	B1 cao
(b)		$-8, -4, -2, 1, 4$	**1**	B1 cao
(c)		$0.6, \frac{2}{3}, 70\ \%, \frac{3}{4}$	**2**	B1 cao
11 (a)		Octagon	**1**	B1 accept alternatives (recognisable) spelling
(b)		$135 + 135 + 90 = 360$ Sum of angles at a point is 360°	**2**	B1 for 360 or (1080) seen B1 for "point", "complete turn" or "a circle" or similar unless accompanied by an incorrect angle SC: if neither B1 scored, award B1 for a clear indication that the size of the angle other then x, is 90º or a right angle (may be on diagram)
(c)	$10 \times 4 + 5 \times 4$	60	**2**	M1 for $10 \times 4 + 5 \times 4$ or attempt to sum 7 or 8 lengths A1 cao
12 (a)		0.87	**2**	B1 cao
(b)		40	**1**	B1 cao
(c)	$\frac{60}{100}$	$\frac{3}{5}$	**1**	B2 cao (B1 for $\frac{60}{100}$ or $\frac{30}{50}$ or $\frac{15}{25}$ or $\frac{12}{20}$ or $\frac{6}{10}$) SC B1 for 0.6
(d)		5 500 000	**1**	B1 cao
(e)		45	**1**	B1 cao

Questions	Working	Answer	Mark	Notes
13 (a)		1710	**1**	B1 accept 5 10pm. Do not accept 510
(b) (i)	83.40 ÷ 10	8.34(0)	**3**	M1 for 83.4 ÷10 oe A1 cao
(ii)		9		B1 ft from "8.34" unless whole number of pounds
14 (a)		6	**2**	B2 for 6 cao (B1 for 5.5 < area ≤ 7)
(b)	See diagram	correct shape	**2**	B2 (B1 for any 2 sides correct, with a minimum of five sides, or a correct enlargement scale factor ≠ 1 or 2)
15		13 17 13 8 25	**2**	B2 All correct (B1 for 2 correct)
16 (a)		$5p + 7q$	**2**	B2 for $5p + 7q$ (accept $5\times p$ etc) (B1 for $5p$ or $7q$ seen)
(b)		$3x + 5y$	**2**	B2 for $3x+ 5y$ (accept $3\times x$ etc) (B1 for $3x$ or $5y$)
(c)		$3w^2$	**1**	B1 accept $3 \times w^2$ or $3 \times w \times w$
17	$80 \times \frac{4}{5}$	64	**2**	M1 80×4 or 320 seen or $80 \div 5$ or 16 seen A1 cao

GCSE MATHEMATICS
MARK SCHEME – Specimen paper (Linear) Foundation Paper 1

Questions	Working	Answer	Mark	Notes
18 (a) (i)		60	**2**	B1 cao
(ii)		eg left triangle is equilateral		B1 for reason
(b)	"60" + 90	150	**2**	M1 for $\frac{180-"60"}{2} + 90$ A1 ft from a(i) if $x < 90$ SC: B1 for answer from "60" + 90 if $x < 90$
19 (a)	$(4 + 3) \times 1000$	7000	**2**	M1 $(4 + 3) \times 1000$ A1 cao
(b)	$(? + 3) \times 1000 = 12\,000$ or $12\,000 \div 1000$	9	**2**	M1 e.g for $\frac{12000}{1000}$ or 12 seen A1 cao
(c)		$C = 1000(n + 3)$	**3**	B3 for $C = 1000\,(n + 3)$ oe such as $C = (n + 3) \times 1000$ (B2 for correct RHS or $C = n + 3 \times 1000$, $C = 1000n + 3$ etc B1 for C = some other linear expression in n or $n + 3 \times 1000$, $1000n + 3$ etc) NB: $C = n$ scores no marks
20		Correct drawing	**2**	B2 for correct 3-D space Condone hidden detail shown with solid lines. (B1 for 1 sketch correct with other sketches incorrect cross-section correct with depths > 1 cube correct plan and side elevation)

Questions	Working	Answer	Mark	Notes
21 (a)		Points plotted	**1**	B1 ± 1 full mark (2 mm square)
(b)		Positive	**1**	B1 cao
(c)		Line of best fit	**1**	B1 must pass through (5, 5) (5, 15) and (55, 35) and (55, 45)
(d)			**1**	B1 ft from a single line segment with positive gradient ± 1 full (2 mm) square
22 (a)	eg $100\times\frac{2500}{1000}$	250	**2**	M1 $\frac{2500}{1000}$ oe seen or 100 + 100 + 50 A1 cao
(b)	eg $800\times\frac{1500}{1000}$	1200	**2**	M1 $\frac{1500}{1000}$ oe seen or 800 + 400 A1 cao
23		question + response boxes oe	**2**	1st aspect: one question with time period (eg each day); ignore other questions 2nd aspect: response list (at least two), no overlapping 3rd aspect: some mention of units (eg hours or number of pieces) in either question or responses Award B2 for all these aspects, or B1 for just two aspects
24 (i)		7^7	**2**	B1 accept 7^{3+4}, 823543
(ii)		7^6		B1 accept 7^{11-5}, 117649

GCSE MATHEMATICS
MARK SCHEME – Specimen paper (Linear) Foundation Paper 1

Questions	Working	Answer	Mark	Notes
25 (a)	$9-2x=3x+6$ $9-6=3x+2x$ $3=5x$	$\frac{3}{5}$	**3**	B1 for $3x+6$ seen OR $3-\frac{2}{3}x=x+2$ M1 for correct rearrangement of 4 terms or $3=5x$ A1 for $\frac{3}{5}$ oe
(b)		$-3,-2,-1,0,1$	**2**	B2 (B1 for 4 correct integers OR not more than one incorrect integer or omissions)
26	$(4\times3)\times11\div2$	66cm^3	**4**	M2 for $4\times3\times11\div2$ (M1 for any three of these) A1 cao numerical answer of 66 B1 (indep) cm^3 with or without any numerical answer

Centre No.						Paper Reference								Surname	Initial(s)
Candidate No.											/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Paper 2 (Calculator)

Foundation Tier

Specimen paper

Time: 1 hour and 30 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator.
Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions in the spaces provided in this question paper.
If you need more space to complete your answer to any question, use additional answer sheets.
You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 25 questions in this question paper. The total mark for this paper is 100.
There are 24 pages in this question paper. Any blank pages are indicated.
Calculators may be used.
If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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N 2 2 3 2 1 A 0 1 2 4

Turn over

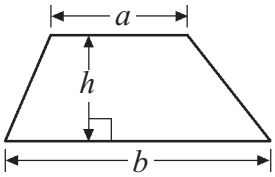
edexcel

GCSE Mathematics

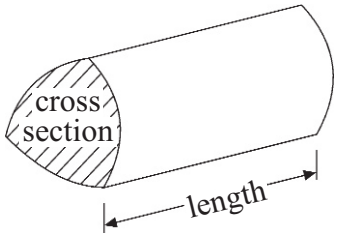
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of a prism = area of cross section × length



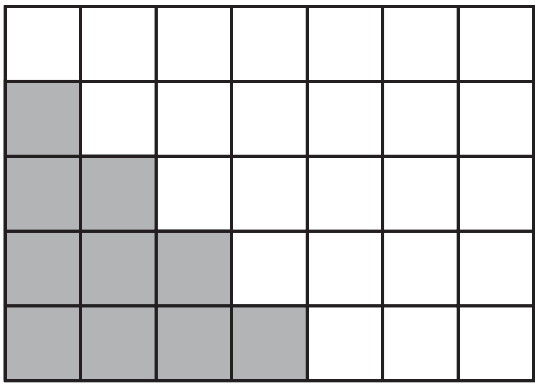
Leave blank

Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. A shaded shape has been drawn on the centimetre grid.



(a) (i) Find the area of the shaded shape.

..... cm^2

(ii) Find the perimeter of the shaded shape.

..... cm

(2)

(b)

The diagram shows a rectangle.

Draw the **two** lines of symmetry on the rectangle.

(2)

(c) Find the volume of this prism.

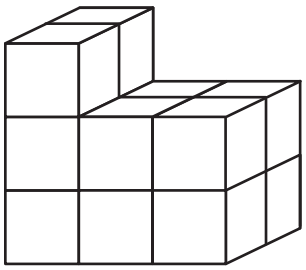
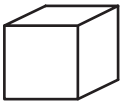


Diagram **NOT** accurately drawn



represents 1 cm^3

..... cm^3

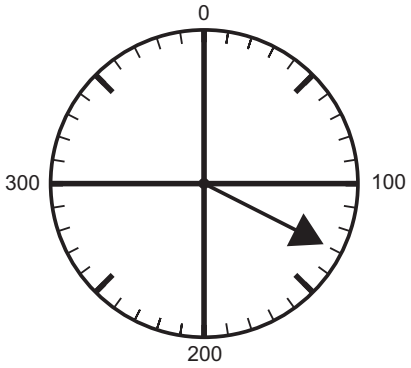
(2)

(Total 6 marks)

Q1

Leave blank

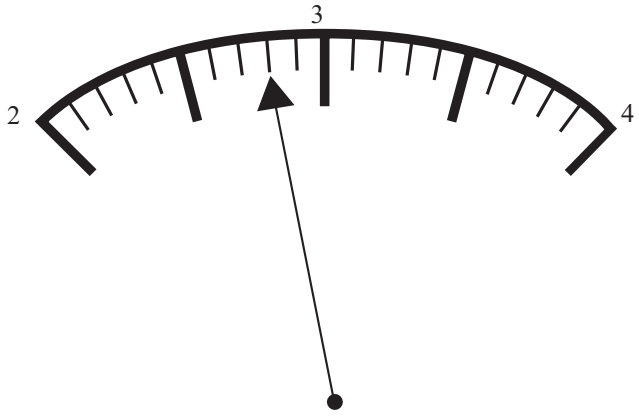
2. (a) Write down the number shown by the arrow.



.....

(1)

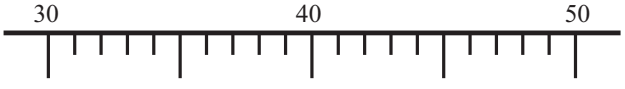
(b) Write down the number shown by the arrow.



.....

(1)

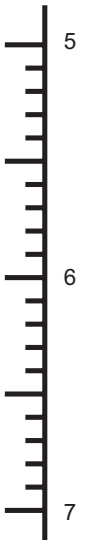
(c) Find the number 38 on the number line.
Mark it with an arrow (↑).



(1)

Leave blank

(d) Find the number 5.4 on the number line.
Mark it with an arrow (→).



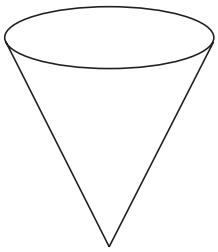
(1)

Q2

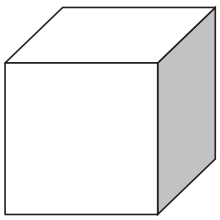
(Total 4 marks)

3. Write down the mathematical name of each of these two 3-D shapes.

(i)



(ii)



(i).....

(ii).....

Q3

(Total 2 marks)

Leave blank

4. Alex carried out a survey of his friends' favourite colours.

Here are his results.

Red	Blue	Yellow	Blue	Red
Green	Red	Blue	Red	Yellow
Red	Blue	Yellow	Green	Red
Yellow	Red	Red	Blue	Red

(a) Complete the table to show Alex's results.

Colours	Tally	Frequency
Red		
Blue		
Yellow		
Green		

(3)

(b) Write down the number of Alex's friends whose favourite colour was green.

.....

(1)

(c) Which was the favourite colour of most of Alex's friends?

.....

(1)

Q4

(Total 5 marks)

Leave blank

5. The table below shows the cost of three types of pen.

Gel pen	£2.20
Fibre tip pen	£2.05
Roller ball pen	£2.60

Tim buys one fibre tip pen and one gel pen.
He pays with a £5 note.

(a) How much change should he get?

.....
(4)

Mrs Holt wants to buy some roller ball pens.
She has £20 to spend.

(b) Work out the greatest number of roller ball pens she can buy.

.....
(2)

Mr Davis buys 20 gel pens.
25% of the 20 gel pens do not work.

(c) Work out 25% of 20

.....
(2)

Q5

(Total 8 marks)

Leave blank

6. (a) The 1st even number is 2

(i) Find the 4th even number.

.....

(ii) Find the 11th even number.

.....

(2)

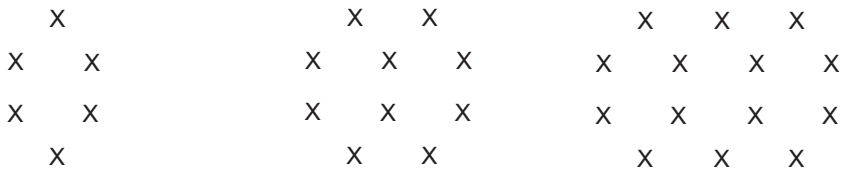
(b) Write down a method you could use to find the 200th even number.

.....

.....

(1)

Here are some patterns made with crosses.



Pattern Number 1 Pattern Number 2 Pattern Number 3

(c) In the space below, draw Pattern Number 4.

(1)

The table shows the number of crosses used to make each pattern.

(d) Complete the table.

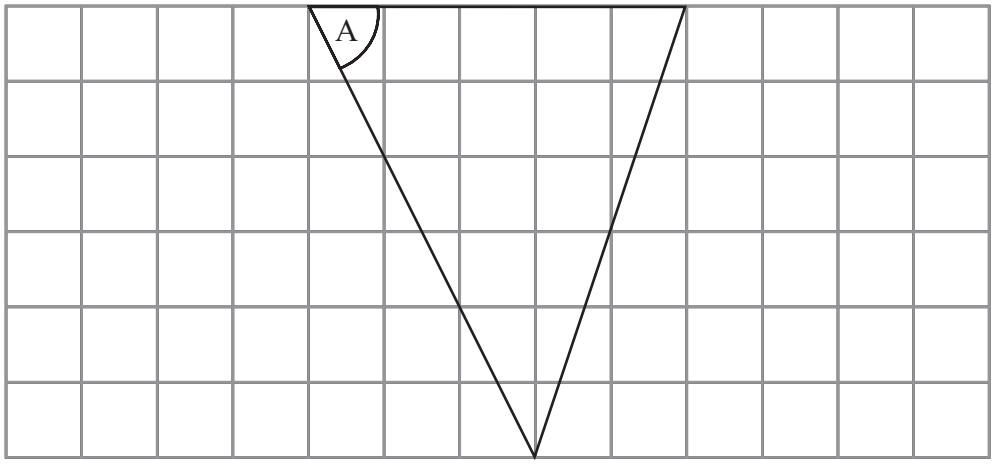
Pattern Number	1	2	3	4	5
Number of crosses	6	10	14		

(2) **Q6**

(Total 6 marks)

Leave blank

7. The diagram shows a triangle drawn on a grid of centimetre squares.



(i) Give the special name of this type of triangle.

.....

(ii) Measure the size of the angle marked with the letter A.

..... °

(iii) What type of angle have you measured?

.....

(Total 3 marks)

Q7

Leave blank

8. Helen writes down the reading on her gas meter on the first day of each month.

Reading on 1st January 2004: 3580 units
Reading on 1st February 2004: 3742 units

Gas is charged at 56p for each unit used.

(a) Work out how much Helen is charged for the gas used in January 2004.

£.....

(4)

In February 2004, Helen used 165 units of gas.

She used $\frac{1}{5}$ of these units in the first week.

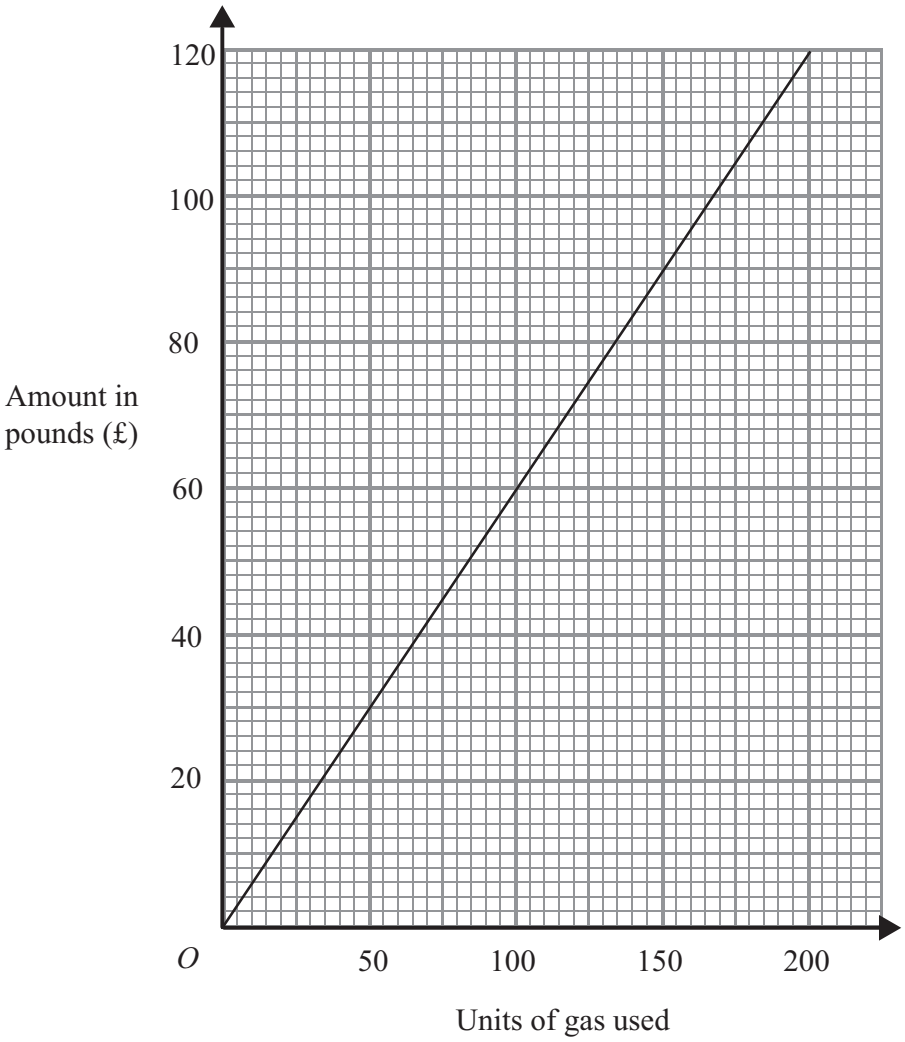
(b) How many units did she use in the rest of February?

..... units

(3)

Leave blank

The gas company increases its charges for units of gas used.
Helen works out the amount she will now be charged for gas used.
She uses the graph below.



(c) Use the graph to write down

(i) the amount Helen will be charged for using 100 units of gas,

£.....

(ii) the number of units of gas used when Helen is charged £90.

..... units

(2)

Q8

(Total 9 marks)

Leave blank

9. The table shows the lowest temperatures during five months in 2004 in a town in Auckland.

Month	Lowest Temperature
January	–16 °C
March	– 6 °C
May	– 1 °C
July	4 °C
September	7 °C

(a) Work out the difference in lowest temperature between January and March.

..... °C
(1)

(b) Work out the difference in lowest temperature between March and July.

..... °C
(1)

(c) In one month, the lowest temperature was 5°C higher than the lowest temperature in May. Which month was this?

.....
(1)

The lowest temperature in November was 10 °C lower than the lowest temperature in May.

(d) Work out the lowest temperature in November.

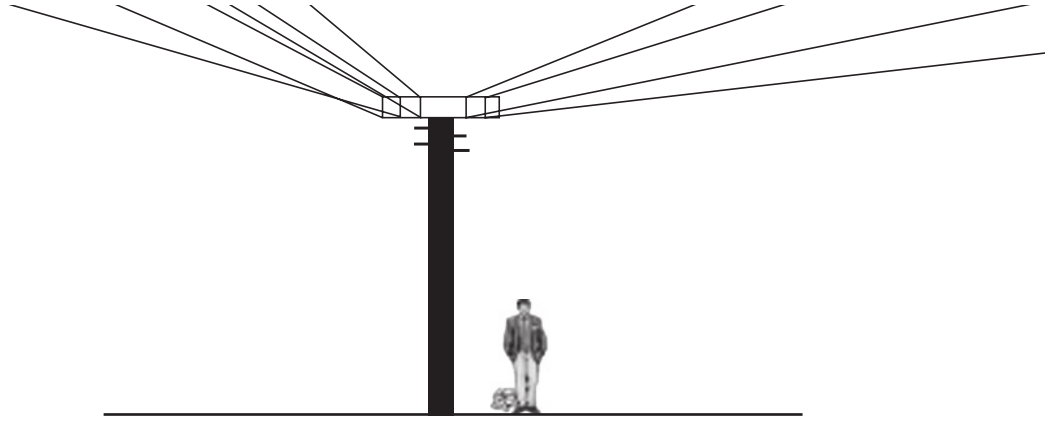
..... °C
(1)

(Total 4 marks)

Q9

Leave blank

10.



The picture shows a man standing next to a telegraph pole.
The man and the telegraph pole are drawn to the same scale.

(a) Write down an estimate for the height, in metres, of the man.

.....
(1)

(b) Estimate the height, in metres, of this telegraph pole.

.....
(3)

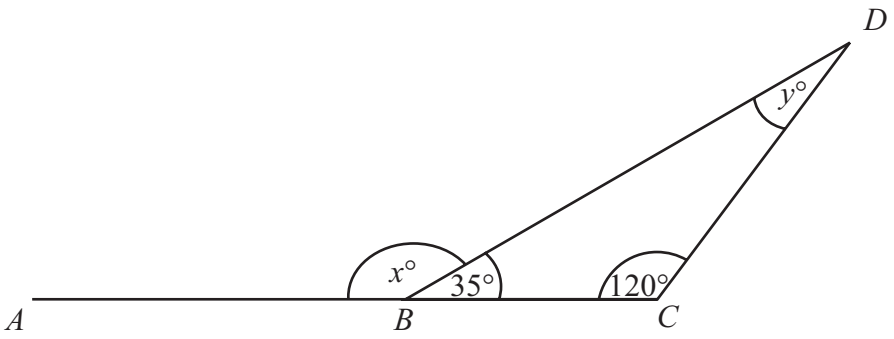
(Total 4 marks)

Q10

Leave blank

11.

Diagram **NOT** accurately drawn



ABC is a straight line.

(a) (i) Work out the size of the angle marked $x°$.

.....°

(ii) Give a reason for your answer.

.....

.....

(2)

(b) (i) Work out the size of the angle marked $y°$.

.....°

(ii) Give a reason for your answer.

.....

.....

(2)

(Total 4 marks)

Q11

Leave blank

12. Joanna made a list of the ages of the children in a playgroup.

4 3 1 4 2 4 4 2 1 2

(a) Find the median age of the children in the play group.

.....

(2)

(b) Find the range of the ages of the children in the playgroup.

.....

(1)

Q12

(Total 3 marks)

13. Angela, Barbara and Carol each collect pop star cards.

Angela has p cards.
Barbara has twice as many cards as Angela.

(a) Write down an expression for the number of cards that Barbara has.

.....

(1)

Carol has 7 cards less than Angela.

(b) Write down an expression for the number of cards that Carol has.

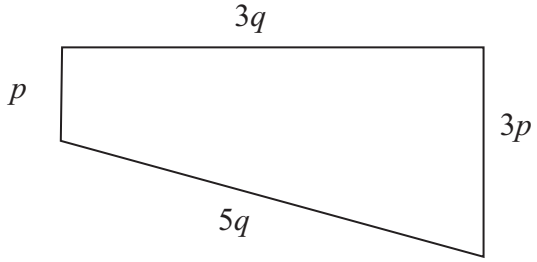
.....

(1)

Q13

(Total 2 marks)

14. Write an expression for the perimeter of the trapezium below.
Write your answer as simply as possible.



Perimeter = ...

Q14

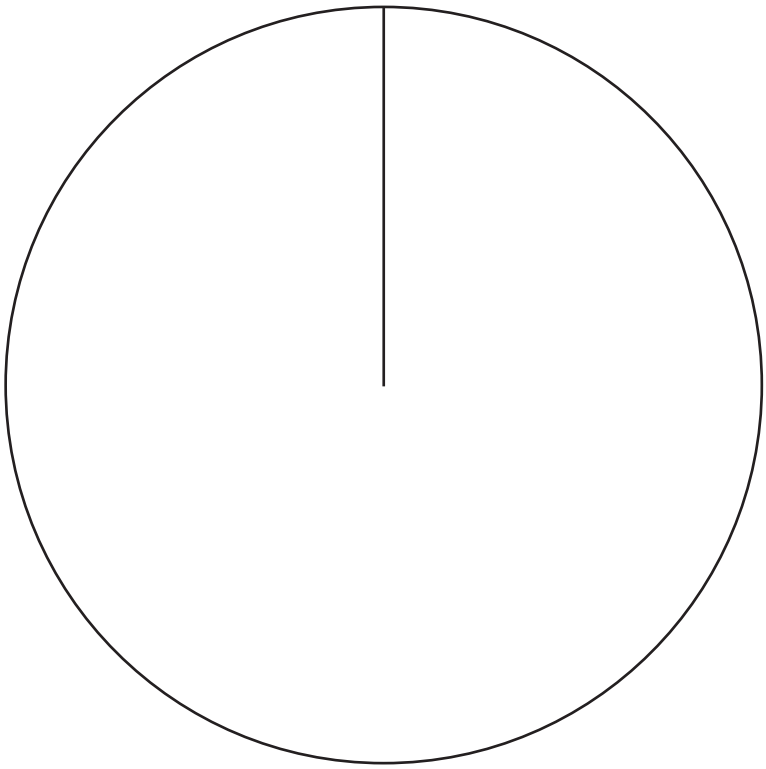
(Total 2 marks)

Leave blank

15. The table gives information about the makes of car in a garage showroom.

Makes of Car	Frequency
Ford	2
Toyota	6
Peugeot	10

Draw an accurate pie chart to show this information.

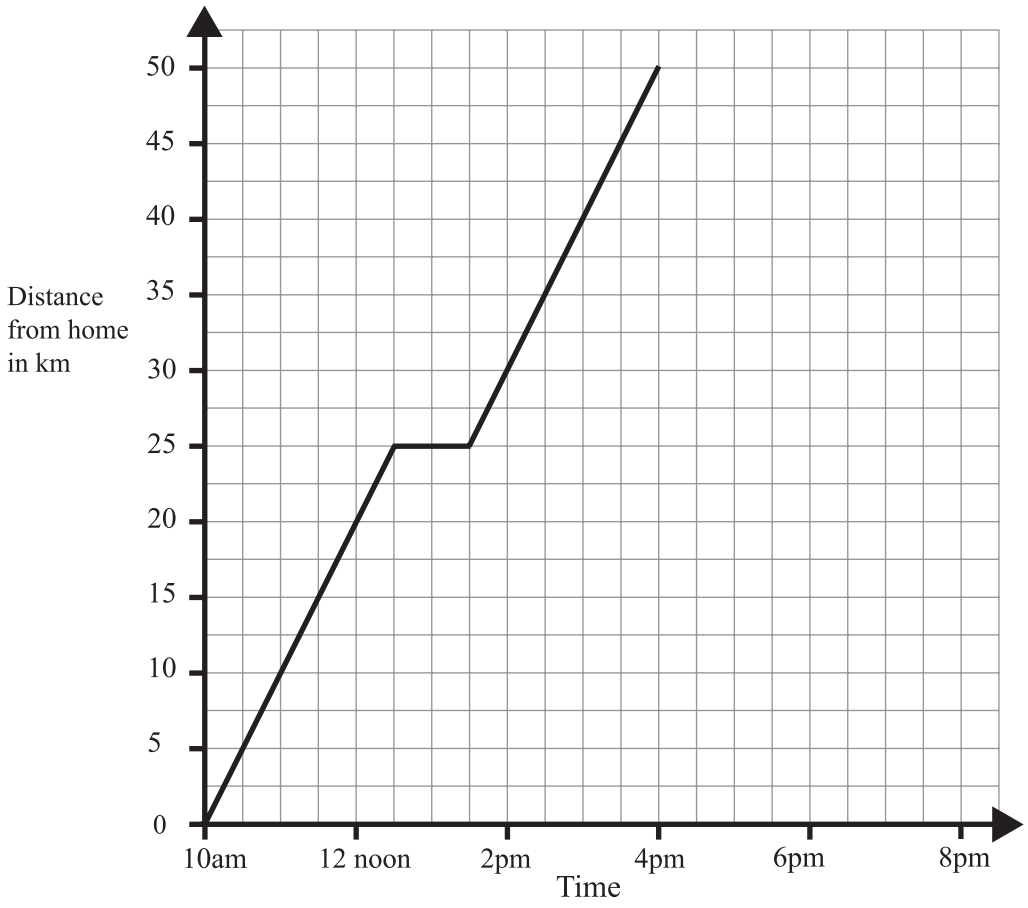


Q15

(Total 4 marks)

Leave blank

16. A man left home at 10 am to visit a friend.
The travel graph represents part of the man's journey.



The man travelled 25 km then stopped for lunch.

(a) At what time did he stop for lunch?

.....
(1)

(b) Find his distance from home at 3 pm.

.....km
(1)

The man reached his friend's home at 4 pm.
He stayed for one hour.
Then he returned home at a steady speed. It took him 3 hours.

(c) Complete the travel graph.

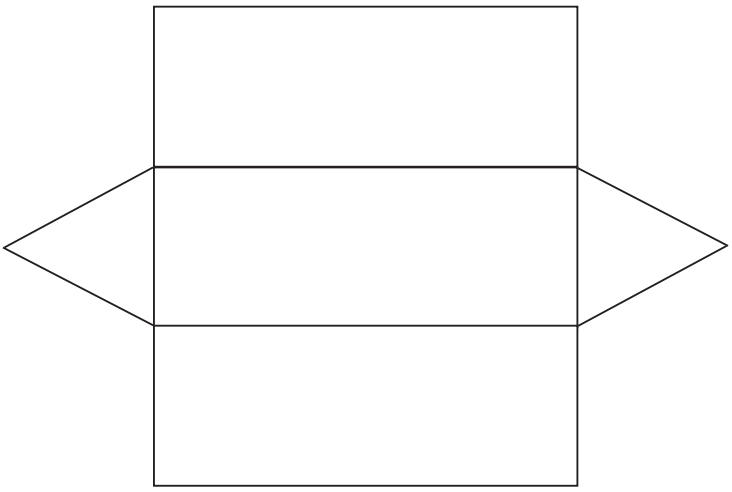
(2)

(Total 4 marks)

Q16

Leave blank

17.



The diagram shows a net of a prism.

In the space below, draw a 3-D sketch of the prism.

Q17

(Total 2 marks)

Leave blank

18. Write the ratio 24:8 in its simplest form.

.....

Q18

(Total 1 mark)

19. Sally thinks of a number.

She adds 11 to the number.
She then multiplies by 3

Her answer is 60

What number did Sally first think of?

.....

Q19

(Total 2 marks)

20. Imran plays a game of chess with his friend.
A game of chess can be won or drawn or lost.

The probability that Imran wins the game of chess is 0.3
The probability that Imran draws the game of chess is 0.25

Work out the probability that Imran loses the game of chess.

.....

Q20

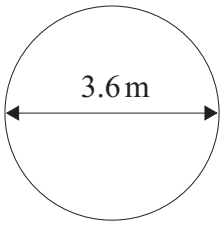
(Total 2 marks)

Leave blank

21. The diagram shows a circle of diameter 3.6 m.

Work out the circumference of the circle.
Give your answer correct to 1 decimal place.

Diagram **NOT** accurately drawn



..... m

(Total 2 marks)

Q21

22. Andy sells CDs.
He sells each CD for £8.80 plus VAT at 17 $\frac{1}{2}$ %.

He sells 650 CDs.

Work out how much money Andy gets.

£.....

(Total 4 marks)

Q22

Leave blank

23. (a) Solve $\frac{x}{3} = 7$

$x =$ .....

(1)

(b) Solve $4(y+3) = 6$

$y =$ .....

(3)

(c) Make h the subject of the formula $f = g + 3h$

$h =$ .....

(2)

(Total 6 marks)

Q23

Leave blank

24. The equation

$$x^3 + 10x = 51$$

has a solution between 2 and 3
Use a trial and improvement method to find this solution.
Give your answer correct to 1 decimal place.
You must show **all** your working.

x = ...

Q24

(Total 4 marks)

Leave blank

25. Three boys shared £48 in the ratio 5:4:3

Daniel received the smallest amount.

(a) Work out the amount Daniel received.

£ .....

(3)

A year ago, Daniel's height was 1.24 metres.
Daniel's height has now increased by 9.5%.

(b) Work out Daniel's height now.
Give your answer to an appropriate degree of accuracy.

..... m

(4)

Q25

(Total 7 marks)

TOTAL FOR PAPER: 100 MARKS

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GCSE MATHEMATICS
MARK SCHEME – Specimen Paper (Linear) Foundation Paper 2

Questions	Working	Answer	Mark	Notes
1 (a) (i)	See diagram	10	**2**	B1 cao
(ii)		16		B1 cao
(b)		Correct lines	**2**	B1 for each correct line
(c)		14	**2**	B2 cao (B1 for 13 or 15)
2 (a)		130	**1**	B1 ± 2 Could be written on diagram
(b)		2.8	**1**	B1 ± 0.2 Could be written on diagram
(c)		Arrow at 38	**1**	B1 allow ± half graduation
(d)		Arrow at 5.4	**1**	B1 allow ± half graduation
3 (i)		Cone	**2**	B1 accept circular pyramid (ignore spelling)
(ii)		Cube		B1(accept cuboid)
4 (a)	Red 𝍸 |||| 9 Blue 𝍸 5 Yellow |||| 4 Green || 2		**3**	M1 for attempt to tally A1 for 1 frequency correct or all tallies correct A1 for all frequencies correct (accept if /20)
(b)		2	**1**	B1 ft
(c)		Red or 9	**1**	B1 ft
5 (a)	£5 – (£2.05 + £2.20)	£0.75, 75p	**4**	M1 £2.05 + £2.20 A1 for £4.25 M1 for £5 – "£4.25" A1 cao
(b)	£20 ÷ £2.60 = 7.6923…	7	**2**	M1 for £20 ÷ 2.60 or sight of digits 769 A1 for 7
(c)	$\frac{1}{4}$ of 20	5	**2**	M1 $\frac{1}{4}$ of £20 oe A1 cao SC B2 for 15

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper (Linear) Foundation Paper 2

Questions	Working	Answer	Mark	Notes
6 (a) (i)		8	**2**	B1 cao
(ii)		22		B1 cao
(b)	$\times 2$		**1**	B1 for explaining a suitable method of continuing the pattern
(c)	See diagram		**1**	B1 for a correct diagram
(d)		18, 22	**2**	B2 cao for both (B1 for one only ft from their "18")
7 (i)		Scalene	**3**	B1 for scalene (accept explanation)
(ii)	See diagram	63 °		B1 61-65 °
(iii)		Acute		B1 for acute (ignore spelling)
8 (a)	3742 – 3580 = 162	90.72	**4**	M1 3742 – 3580 A1 162
	"162" × 56p			M1 for "162" × 56p or 9072 seen A1 cao **Or** M1 for 3580 × 56 (or digits 20048(0) seen) or 3742 × 56 (or digits 209552 seen) A1 if one correct M1 for "209552" – "200480" or 9072 seen A1 cao
(b)	$\frac{1}{5} \times 165 = 33$	132	**3**	M1 $\frac{1}{5} \times 165$ (or M1 for $\frac{4}{5}$ seen)
	165 – "33"			A1 for 33 (or M1 for $\frac{4}{5} \times 165$) A1 for 132 ft
(c) (i)		60	**2**	B1 for 60 (± 1)
(ii)		150		B1 for 150 (± 3)

Questions	Working	Answer	Mark	Notes
9 (a)		10	**1**	B1 accept –10
(b)		10	**1**	B1 accept –10
(c)		July	**1**	B1 accept 4
(d)		–11	**1**	B1 cao
10 (a)		1.5 – 2.0	**1**	B1 for height: 1.5 – 2.0
(b)	Height of man × "2.5"	3 – 6	**3**	B3 for height between 3m – 6m inclusive (B2 for multiplying (a) by a number between 2 and 3 inclusive) (B1 for multiplying (a) by a number cannot be implied)
11 (a) (i)	180 – 35	145	**2**	B1 cao
(ii)		Sum of angles on a straight line equals 180°		B1 for (angles in a straight) **line** (add to) **180°**
(b) (i)	180 – 120 – 35	25	**2**	B1 cao
(ii)		Sum of angles in a triangle is 180°		B1 for (**angle**s in a) **triangle** (add to) **180°**
12 (a)	1 1 2 2 2 3 4 4 4 4	2.5	**2**	M1 for ordering ages correctly A1 cao
(b)	4 – 1	3	**1**	B1 cao
13 (a)		$2p$	**1**	B1 accept $2 \times p$ or $p2$ or $p \times 2$ or $p + p$
(b)		$p - 7$	**1**	B1 cao
14	$p + 3q + 3p + 5q$	$4p + 8q$	**2**	B2 accept in reverse formation accept $p4$, $4 \times p$ etc (B1 for $4p$ or $8q$ seen)
15	$360^{o} \div 18$ (= 20) Sector angles: F = 40; T = 120; P = 200; Correct sectors labelled correctly Use overlay	Angles drawn, labelled	**4**	B4 for fully correct and labelled pie chart (B3 for all angles correct or a labelled pie chart with 2 angles correct) (B2 for labelled pie chart with 1 correct angle)) (B1 for 360° ÷ 18 or 20 seen or implied)

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper (Linear) Foundation Paper 2

Questions	Working	Answer	Mark	Notes
16 (a) **(b)** **(c)**		12.30 pm 40	**1** **1** **2**	B1 for 12:30 (± 5 min) B1 for 40 (± 2 km) B1 horizontal. line from (4, 50) to (5, 50) B1 line from (5, 50) to (8, 0) or horizontal translation of it SC B1 for any journey ending at (8, 0)
17		Correct prism	**2**	B2 for a reasonable 3-D drawing in perspective B1 for attempt at 3-D drawing
18		3:1	**1**	B1 cao
19	60 ÷ 3 = 20 20 – 11	9	**2**	M1 for ÷ 3 or 20 seen or $3(x+11)$ A1 cao
20	0.3 + 0.25 1 – 0.55	0.45 oe	**2**	M1 for 1– (0.3 + 0.25) A1 for 0.45 oe [SC:B1 for 0.72]
21	$\pi \times 3.6$	11.3	**2**	M1 For $\pi \times 3.6$ (accept π as 3.1 or better) A1 for 11.16 to 11.32

Questions	Working	Answer	Mark	Notes
22	$8.80 \times \frac{17.5}{100} = 1.54$ 8.80 + 1.54 = 10.34 650 × "10.34" 7800 + 6084	£6721	**4**	M1 for $8.80 \times \frac{17.5}{100}$ or digits 1.54 seen or 8.80 × 1.175 (oe) (Award M1 for 10%, 5% and $2\frac{1}{2}$% correctly calculated) M1 for 8.80+"1.54" dep on previous M1 (M1 dep) M1 for 650 × "10.34"or digits 6721 seen A1 cao **Alternative** M1 for 650 × 8.8(0) or digits 5720 seen M1 for "5720" $\times \frac{17.5}{100}$ or 1001 seen (M2 for "5720" × 1.175 oe seen) (Award M1 for 10%, 5% and $2\frac{1}{2}$% correctly calculated) M1 for "5720" + "1001" (dep on both previous Method marks) or digits 6721 seen A1 cao

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper (Linear) Foundation Paper 2

Questions	Working	Answer	Mark	Notes
23 (a)	$x = 7 \times 3$	21	**1**	B1 cao
(b)	$4y + 12 = 6$ $4y = -6$	–1.5	**3**	B1 for $4y + 12$ or $y + 3 = 6 \div 4$ M1 for isolating $4y$ A1 oe
(c)	$f - g = 3h$ or $\frac{f}{3} = \frac{g}{3} + h$	$\frac{f-g}{3}$ oe	**2**	M1 for $f - g = 3h$ or $\frac{f}{3} = \frac{g}{3} + h$ A1 cao
24	2.5 → 40.6 (25) 2.6 → 43.5 (76) 2.7 → 46.6 (83) 2.8 → 49.9 (50) 2.9 → 59.3 (89) 2.85→ 51.6 (49)	2.8	**4**	B2 for a trial between 2 and 3 exclusive (B1 for a trial at 2 or 3) B1 for a trial between 2.8 and 2.9 exclusive B1 (dep on at least one previous B1) for 2.8 NB trials should be evaluated to at least 1 dp truncated or rounded

Questions	Working	Answer	Mark	Notes
25 (a)	$48 \div (5 + 4 + 3)$ "4" × 3	12	**3**	M1 for $48 \div (5 + 4 + 3)$ M1 (dep) for "4" × 3 or "4"×5 or "4"×4 A1 cao [SC: B2 for 20:16:12 only]
(b)	$1.24 \times \frac{95}{100} = 0.1178$ $1.24 + 0.1178 = 1.3578$	1.36 or 1.4	**4**	M1 for $1.24 \times \frac{95}{100}$ or 0.11(78) seen M1 (dep) for 1.24 +" 0.11(78)" A1 for 1.4 or better B1 (indep) for rounding their answer correctly to 1 or 2dp OR M1 for $1.24 \times \frac{100 + 9.5}{100}$ M1 (dep) for 1.24 ×"1.095" or 0.0124 ×"109.5" A1 for 1.4 or better B1 (indep) for rounding their answer correctly to 1 or 2dp

Question 6(b)

Count all the evens until you get to the 100^{th} even number

Double 100

Write down the even numbers and count the 100^{th}

Go up in two's

Add on 2 each time

100 + 100

Keep counting missing a number

By taking out all the odds

Go up in order where all the numbers end in 2, 4, 6, 8, 0

Do your 2 times table

Numbers in the 2 times table

Keep going 2 numbers forward

Add 2 to the previous term

10 × 20

10 × 10

The tenth even number times by 10

Add a zero to the tenth even number

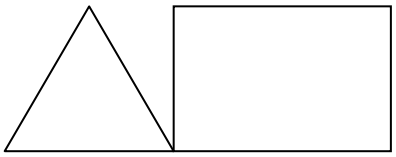
Add 1 to the 100^{th} odd number

Take 1 away from the 100^{th} odd number

Count on until you get the 100^{th} even number

Question 17

1



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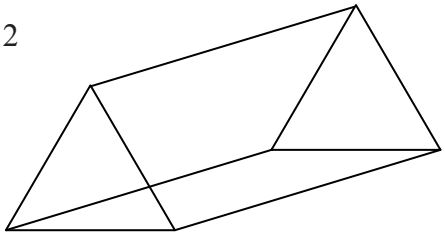
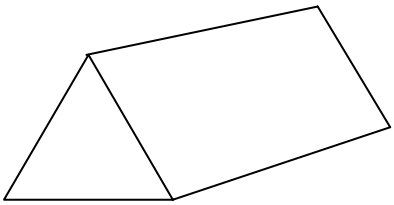
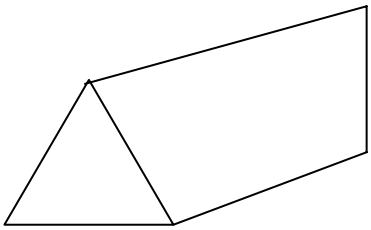


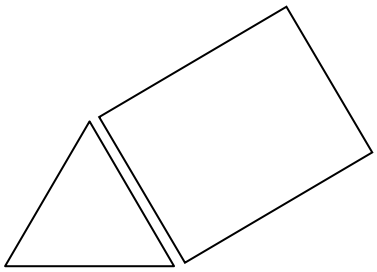
3



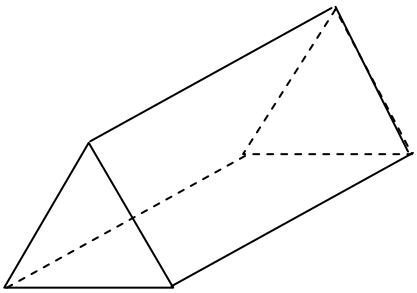
4



5.



6



Centre No.						Paper Reference								Surname	Initial(s)
Candidate No.											/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Paper 3 (Non-Calculator)

Higher Tier

Specimen paper

Time: 1 hour and 45 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions in the spaces provided in this question paper.
If you need more space to complete your answer to any question, use additional answer sheets.
You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 22 questions in this paper. The total mark for this paper is 100.
There are 20 pages in this question paper. Any blank pages are indicated.
Calculators must not be used.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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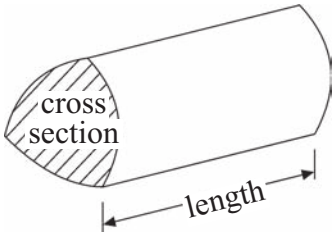
GCSE Mathematics

Formulae: Higher Tier

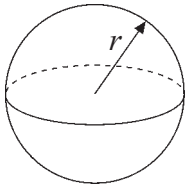
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



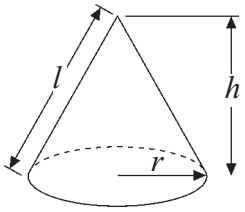
Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$

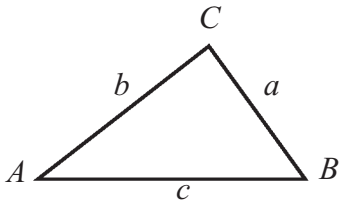


Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi rl$



In any triangle ABC



Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle $= \frac{1}{2}ab\sin C$

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

Leave blank

Answer ALL TWENTY TWO questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1. The diagram shows the plan of a floor.
There is a carpet in the middle of the floor.

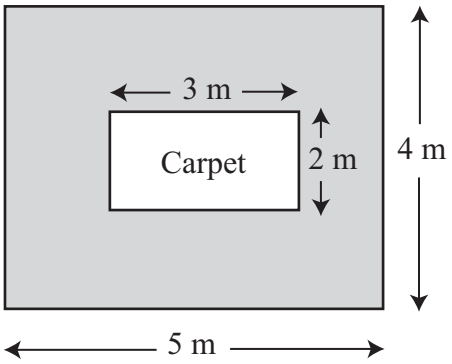


Diagram **NOT** accurately drawn

Work out the shaded area.

..... m^2

(Total 3 marks)

Q1

2. (a) Work out the value of $3a + ac$ when $a = 4$ and $c = -5$

.....

(2)

(b) Work out the value of $3p^2 - 5$ when $p = 2$

.....

(3)

(Total 5 marks)

Q2

Leave blank

3. The cost of a calculator is £6.79

(a) Work out the cost of 28 of these calculators.

£ .....

(3)

A college wants to buy 570 calculators.
They are sold in boxes of 50

(b) Work out the number of boxes the college should buy.

.....

(2)

The college decides to increase its order of calculators by 10%.

(c) Increase 570 by 10%.

.....

(3)

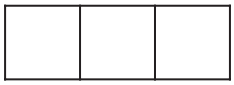
(Total 8 marks)

Q3

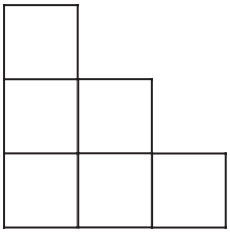
Leave blank

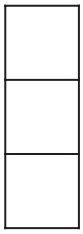
4. Here are the plan, front elevation and side elevation of a 3-D shape.

plan



front elevation





side elevation

(a) In the space below, draw a sketch of the 3-D shape.

(2)

Here is a sketch of a different 3-D shape.
The shape is a cylinder with a cone on top.

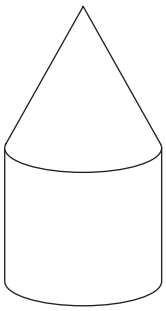


Diagram **NOT** accurately drawn

(b) Sketch the front elevation of this 3-D shape.

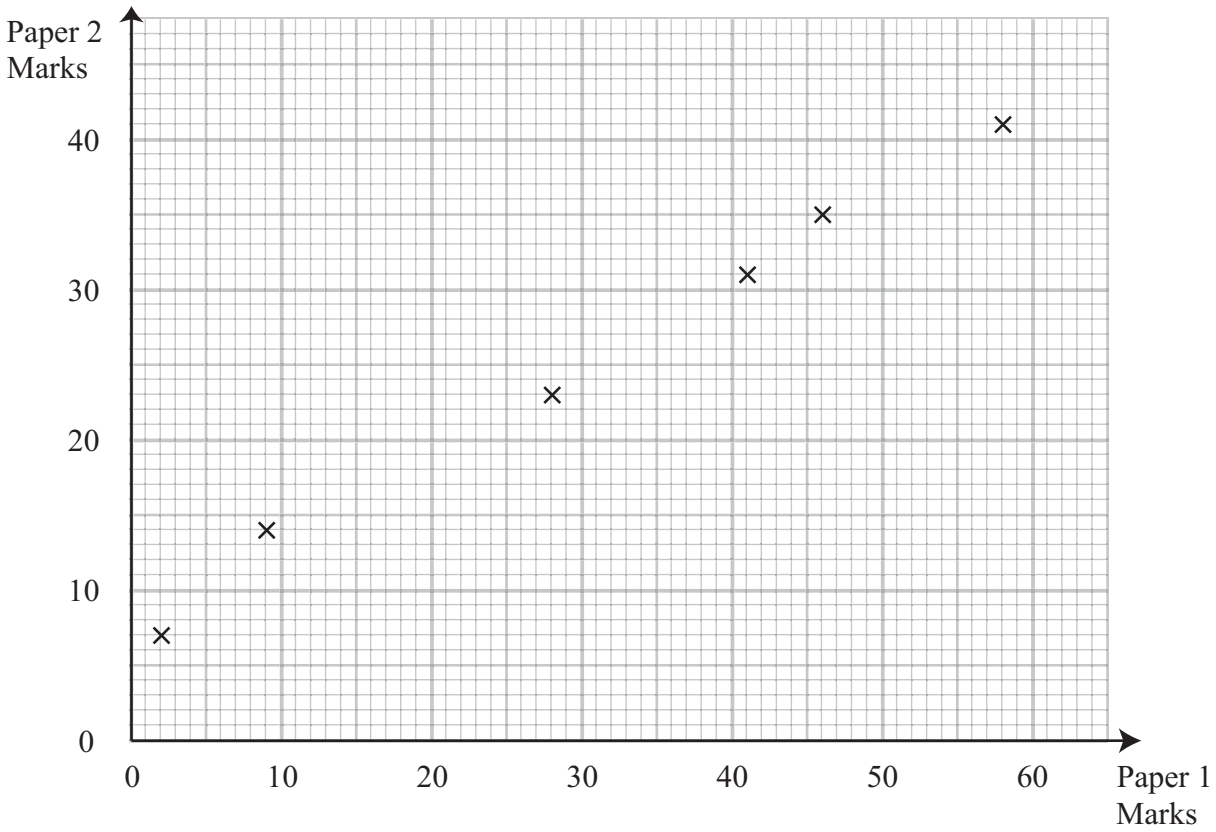
(2)

(Total 4 marks)

Q4

Leave blank

5. The scatter graph shows some information about the marks of six students.
For each student, it shows the mark on Paper 1 and the mark on Paper 2.



The table shows the marks on Paper 1 and Paper 2 for two more students, A and B.

	Student A	Student B
Paper 1 mark	20	50
Paper 2 mark	20	35

(a) On the scatter graph, plot the information from the table.

(1)

(b) Describe the **correlation** between the marks on Paper 1 and the marks on Paper 2.

.....

(1)

(c) Draw a line of best fit on the diagram.

(1)

Another student has a mark of 30 on Paper 2.

(d) Use your line of best fit to estimate the mark on Paper 1 for this student.

.....

(1)

(Total 4 marks)

Q5

Leave blank

6. This rule can be used to work out the cost, in pounds, of buying time on a satellite link.

Add 3 to the number of hours of time bought.
Multiply your answer by 1000

The cost of buying n hours of satellite time is C pounds.

Write down a formula for C in terms of n.

.....

Q6

(Total 3 marks)

Leave blank

7. (a) Expand $p(p^2 - 3p)$

.....

(2)

(b) Factorise $y^2 + 5y$

.....

(2)

(c) Factorise completely $2x^2 + 6xy$

.....

(2)

(d) Solve $x^2 - 2x - 15 = 0$

.....

(2)

Q7

(Total 8 marks)

8. Tony wants to collect information about the amount of homework the students in his class get.

Design a suitable question he could use.

You should include response boxes.

Q8

(Total 2 marks)

Leave blank

9.

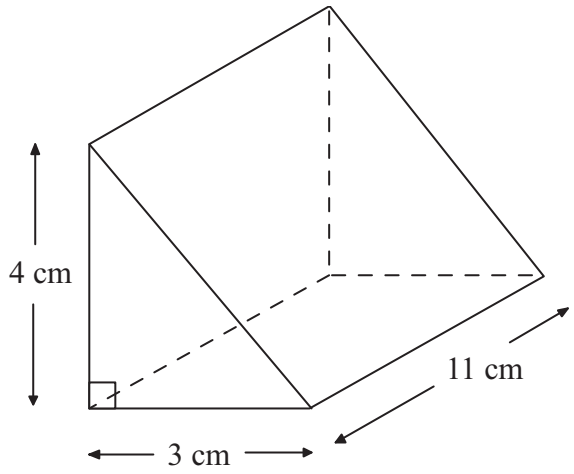


Diagram **NOT** accurately drawn

Work out the volume of the triangular prism.
Give the units with your answer.

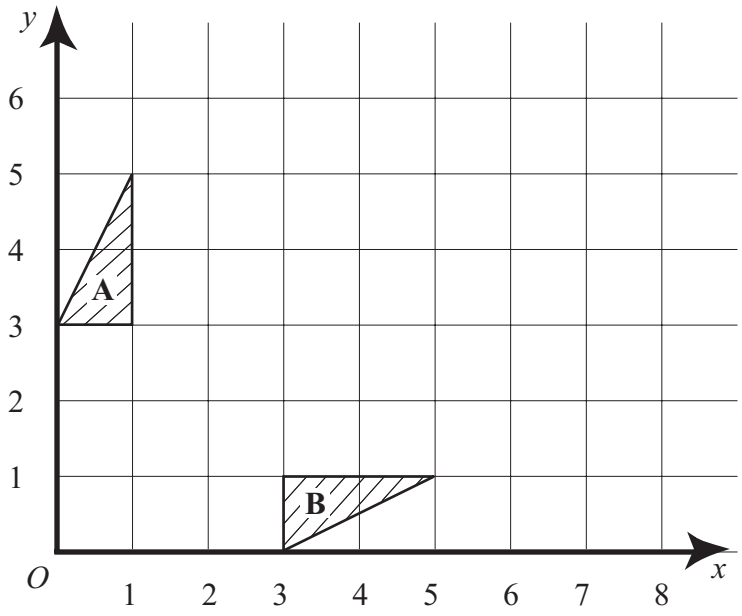
.....

Q9

(Total 4 marks)

Leave blank

10.



Triangle **A** and triangle **B** have been drawn on the grid.

(a) Reflect triangle **B** in the line $y = 2$
Label this image **C**.

(2)

(b) Describe fully the single transformation which will map triangle **B** onto triangle **A**.

.....

(2)

(Total 4 marks)

Q10

11. (a) Solve $9 - 2x = 3(x + 2)$

$x =$ .....

(3)

(b) $-3 \leqslant y < 2$

y is an integer.

Write down all the possible values of y.

.....

(2)

(Total 5 marks)

Q11

Leave blank

12. (a) Work out the value of $1\frac{2}{5} + 2\frac{3}{7}$

Give your answer as a fraction in its simplest form.

.....

(3)

(b) Work out the value of $\frac{2}{5} \times \frac{3}{7}$

Give your answer as a fraction in its simplest form.

.....

(2)

Q12

(Total 5 marks)

Leave blank

13.

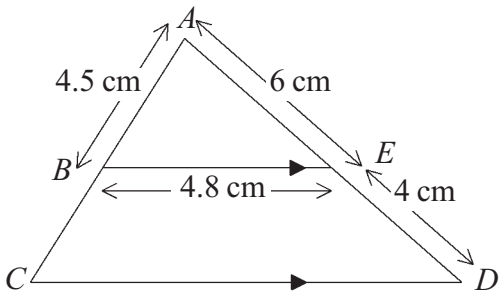


Diagram **NOT** accurately drawn

BE is parallel to *CD*.
AE = 6 cm, *ED* = 4 cm, *AB* = 4.5 cm, *BE* = 4.8 cm.

Calculate the length of *CD*.

.....cm

Q13

(Total 2 marks)

14. The table shows some expressions.
a, *b*, *c* and *d* represent lengths.
π and 3 are numbers which have no dimensions.

$3a^2$	$\frac{\pi ab^3}{3d}$	πbc	$ac + bd$	$\pi(a+b)$	$3(c+d)^3$	$3\pi bc^2$

Tick (✓) the boxes underneath the **three** expressions which could represent areas.

Q14

(Total 3 marks)

Leave blank

15. A spinner has coloured sections.
The sections are different sizes.
When the spinner is spun, the pointer lands on a colour.

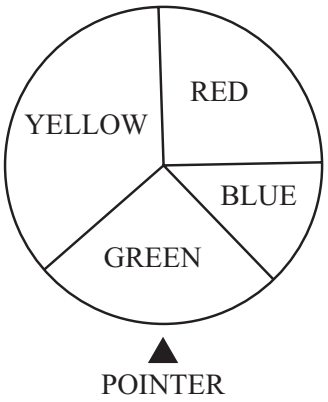


Diagram **NOT** accurately drawn

The table shows the probability for the pointer landing on yellow and blue.
The probability of the pointer landing on red is equal to the probability of the pointer landing on green.

Number	RED	YELLOW	BLUE	GREEN
Probability	x	0.35	0.15	x

(a) Work out the value of x.

x = ...
(2)

Sarah is going to spin the wheel 400 times.

(b) Work out an estimate for the number of times it will land on BLUE.

.....
(2)

Q15

(Total 4 marks)

Leave blank

16.

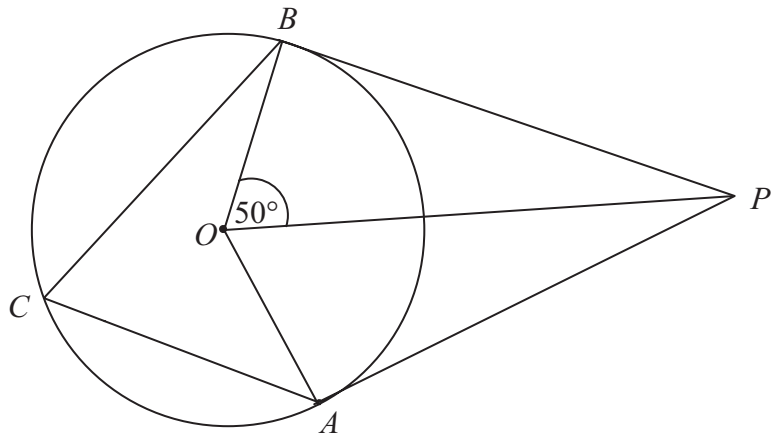


Diagram **NOT** accurately drawn

In the diagram, *A*, *B* and *C* are points on the circumference of a circle, centre *O*.
PA and *PB* are tangents to the circle.
Angle *POB* = 50°.

(a) (i) Work out the size of angle *BPO*.

.....°

(ii) Give a reason for your answer.

.....

.....

(2)

(b) (i) Work out the size of angle *ACB*.

.....°

(ii) Give a reason for your answer.

.....

.....

(3)

Q16

(Total 5 marks)

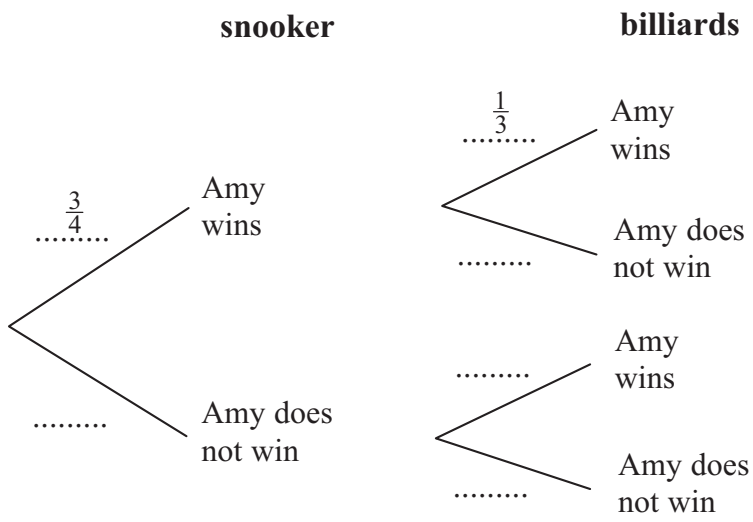
Leave blank

17. Amy is going to play one game of snooker and one game of billiards.

The probability that she will win the game of snooker is $\frac{3}{4}$

The probability that she will win the game of billiards is $\frac{1}{3}$

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Amy will win **exactly** one game.

.....

(3)

Amy played one game of snooker and one game of billiards on a number of Fridays.
She won at **both** snooker and billiards on 21 Fridays.

(c) Work out an estimate for the number of Fridays on which Amy did not win either game.

.....

(3) **Q17**

(Total 8 marks)

Leave blank

18. (a) Change $\frac{5}{6}$ to a decimal.

.....

(1)

(b) Prove that the recurring decimal $0.\dot{3}\dot{6} = \frac{4}{11}$

(3) **Q18**

(Total 4 marks)

19. p is inversely proportional to r.
$p = 7$ when $r = 12$

(a) Work out the value of p when $r = 3$

$p =$ .....

(4)

(b) Work out the value of r when $p = 24$

$r =$ .....

(2) **Q19**

(Total 6 marks)

Leave blank

20. (a) Find the value of

(i) 81^0

.....

(ii) $81^{\frac{1}{2}}$

.....

(iii) $81^{-\frac{3}{4}}$

.....

(4)

(b) $4\sqrt{n} = 4^{\frac{3}{2}}$

Find the value of n.

$n =$ .....

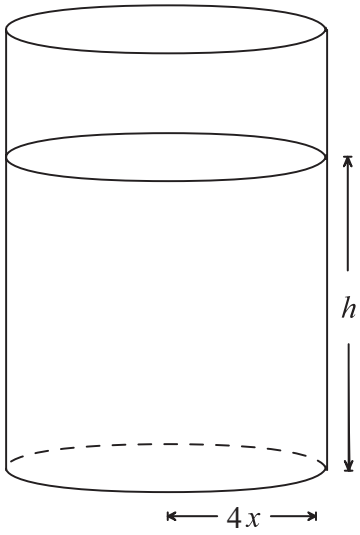
(2)

Q20

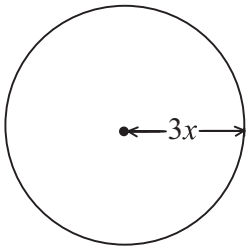
(Total 6 marks)

Leave blank

21.



Cylinder



Sphere

Diagram **NOT** accurately drawn

The radius of the base of a cylinder is $4x$ cm.
The cylinder is filled with water to a height of h cm.
The radius of a sphere is $3x$ cm.
The sphere is dropped into the cylinder and is completely immersed.

Find, in terms of x, the increase in the height of the water in the cylinder.
Give your answer in its simplest form.

..... cm

Q21

(Total 3 marks)

Leave blank

22.

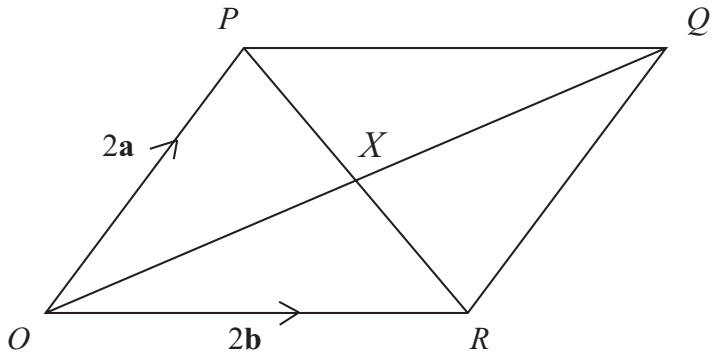


Diagram **NOT** accurately drawn

OPQR is a parallelogram with *PQ* parallel to *OR*.

$\overrightarrow{OP} = 2\mathbf{a}$ $\overrightarrow{OR} = 2\mathbf{b}$

X is the midpoint of *PR*.

(a) Find the vector $\overrightarrow{PX}$ in terms of **a** and **b**.

$\overrightarrow{PX}$ = ...

(2)

(b) Prove that *X* is the midpoint of *OQ*.

(2) **Q22**

(Total 4 marks)

TOTAL FOR PAPER: 100 MARKS

END

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GCSE MATHEMATICS
MARK SCHEME – Specimen paper (Linear) Higher Paper 3

Questions	Working	Answer	Mark	Notes
1		14	**3**	M1 for 5 × 4 (= 20) or 3 × 2 or attempt to divide diagram into rectangles M1 "20" – "6" or addition of parts A1 cao
2 (a)	$3 \times 4 + 4 \times -5 = 12 - 20$	–8	**2**	M1 substitution eg. 3×4 and 4×-5 or 12 and –20 A1 cao
(b)	$3 \times 2^2 - 5$ $3 \times 4 - 5$	7	**3**	M1 substitution eg $3 \times 2^2 - 5$; do not accept $32^2 - 5$ M1 $3 \times 4 - 5$ or $3 \times 2 \times 2 - 5$ or $12 - 5$ A1 cao
3 (a)	679 or 28 28 679 5432 252 13580 1960 19012 16800 19012	190.12	**3**	M1 for an attempt to multiply the units and tens, or correct partitioning M1 for completely correct method (condone one computational error) A1 cao
(b)	$570 \div 50$	12	**2**	M1 $570 \div 50$ or 11.4 or 11 seen A1 cao
(c)	$570 \times \frac{110}{100}$	627	**3**	M1 for $\frac{110}{100} \times 570$ or $570 \div 10$ or 57 seen M1 (dep) 570 + "57" (or M2 for 570×1.10) A1 cao

GCSE MATHEMATICS
MARK SCHEME – Specimen paper (Linear) Higher Paper 3

Questions	Working	Answer	Mark	Notes
4 (a)		Correct drawing	**2**	B2 Condone hidden detail shown with solid lines, or missing lines on front face (B1 for correct plan and side elevation, cross-section correct with depth > 1 cube, or one added cube)
(b)		Correct drawing	**2**	B2 Ignore relative proportion, do not accept a rectangle when one side > 1.5x other side (B1 one shape only)
5 (a)		Points plotted	**1**	B1 ± 1 full mark (2 mm square)
(b)		Positive	**1**	B1 cao
(c)		Line of best fit	**1**	B1 must pass through (5, 5) (5, 15) and (55, 35) and (55, 45)
(d)			**1**	B1 ft from a single line segment with positive gradient ± 1 full (2 mm) square
6		C = 1000(n + 3)	**3**	B3 for C=1000(n + 3) oe such as (n + 3) ×1000 (B2 for correct RHS or C = n + 3 × 1000, C = 1000n + 3 etc) (B1 for C = some other linear expression in n or n + 3 × 1000, 1000n + 3 etc) NB $C = n$ scores no marks

Questions	Working	Answer	Mark	Notes
7 **(a)**		$p^3 - 3p^2$	**2**	B2 cao (B1 for $p^3 or 3p^2$ seen in working, ignore signs)
(b)		$y(y+5)$	**2**	B2 for $y(y + 5)$ or $y \times (y + 5)$, (B1 for $y(ay + b)$ where $a, b, b \neq 0$ are numbers or $y + 5$ seen on its own, or part of an expression)
(c)		$2x(x+3y)$	**2**	B2 cao (B1 for $2(x^2 + 3xy)$ or $x(2x + 6y)$ or $2x(...)$)
(d)	$x^2 - 2x - 15 = (x - 5)(x + 3)$	5, –3	**2**	B2 cao (B1 for $x - 5$) or $(x + 3)$ seen in working)
8		question + response boxes oe	**2**	1st aspect: one question with time period (eg each day); ignore other questions 2nd aspect: response list (at least two), no overlapping 3rd aspect: some mention of units (eg hours or number of pieces) in either question or responses Award B2 for all these aspects, or B1 for just two aspects

GCSE MATHEMATICS
MARK SCHEME – Specimen paper (Linear) Higher Paper 3

Questions	Working	Answer	Mark	Notes
9	$(4 \times 3) \times 11 \div 2$	66cm^3	**4**	M2 for $4\times3\times11\div2$ (M1 for any three of these) A1 cao numerical answer of 66 B1 (indep) cm^3 with or without any numerical answer
10 (a)		Correct reflection	**2**	B2 cao (B1 for reflection in a line other than $y = 2$)
(b)		Reflection in $y = x$	**2**	B2 cao (B1 for "reflection" or $y = x$) NB: inclusion with other transformations get B0
11 (a)	$9 - 2x = 3x + 6$ $9 - 6 = 3x + 2x$ $3 = 5x$	$\frac{3}{5}$	**3**	B1 for $3x + 6$ seen OR $3 - \frac{2}{3}x = x + 2$ M1 for correct rearrangement of 4 terms or $3 = 5x$ A1 for $\frac{3}{5}$ oe
(b)		$-3,-2,-1,0,1$	**2**	B2 (B1 for 4 correct integers and not more than one incorrect integers or omissions)

Questions	Working	Answer	Mark	Notes
12 (a)	$1+2+\frac{14}{35}+\frac{15}{35}$	$3\frac{29}{35}$	**3**	M1 for attempt to convert to fractions with common denominator eg two fractions, denominator of 35 A1 for correct conversion: $\frac{14}{35}$ and $\frac{15}{35}$ seen (oe) A1 cao OR Attempt to convert decimals: must use at least 2dp M1 $0.4+0.42$ (or $1.4+2.42$) or $0.4+0.43$ etc A1 3.82, 3.83, etc A1 3.82857 (ie at least 5 dp)
(b)	$\frac{2}{5}\times\frac{3}{7}=\frac{6}{35}$	$\frac{6}{35}$	**2**	M1 For 6 or multiplication of top or bottom eg $\frac{6}{35}$, $\frac{840}{4900}$ A1 cao
13	$\frac{10}{6}\times 4.8$	8	**2**	M1 for $48 \div 6 \times 10$ A1 cao
14		1^{st}, 3^{rd}, 4^{th}	**3**	B3 (B1 for each, –1 each extra)
15 (a)	$x+0.35+0.15+x=1$	0.25	**2**	M1 for $x+0.35+0.15+x=1$ oe, or $0.5\div 2$ A1 cao
(b)	0.15×400	60	**2**	M1 0.15×400 A1 cao accept 60 out of 400 (in words) SC B1 for $\frac{60}{400}$

GCSE MATHEMATICS
MARK SCHEME – Specimen paper (Linear) Higher Paper 3

Questions	Working	Answer	Mark	Notes
16 (a) (i)		40	**2**	B1 cao
(ii)		Identifies angle between radius and tangent as 90°		B1 reason in words, linking radius and tangent (edge insufficient)
(b) (i)	$2 \times 50° \div 2 =$	50°	**3**	May be in working or on diagram M1 $2\times50°\div2$
(ii)		Angle at the centre is twice the angle at the circumference.		A1 50° B1 reason in words
17 (a)		$\frac{1}{4}$ on LH branch	**2**	B1
		$\frac{2}{3}, \frac{1}{3}, \frac{2}{3}$ on RH branches		B1
(b)	$\frac{3}{4}\times\frac{2}{3}+\frac{1}{4}\times\frac{1}{3}=\frac{6}{12}+\frac{1}{12}$	$\frac{7}{12}$	**3**	M1 for $\frac{3}{4}\times\frac{2}{3}$ or $\frac{1}{4}\times\frac{1}{3}$ from their tree diagram M1(dep) for sum of two correct products A1 for $\frac{7}{12}$ oe
(c)		84	**3**	M1 for $\frac{3}{4}\times\frac{1}{3}\left(=\frac{3}{12}\right)$ or $1-\frac{9}{12}$ M1 for $21\times\frac{"12"}{3}$ ft from their tree diagram; must be from a product A1 cao

Questions	Working	Answer	Mark	Notes
18 (a)		0.8333…	**1**	B1 for 0.8333… oe or $0.8\dot{3}$
(b)	eg $x = 0.3636\ldots$ so $100x = 36.3636\ldots$ $99x = 36$ $x = \frac{36}{99} = \frac{4}{11}$		**3**	M1 for $100x = 36.36...$ M1 dep for subtraction of both sides A1 for $\frac{4}{11}$ from correct proof [SC: B1 for $\frac{36}{11}$ or 4 ÷ = 0.3636 showing remainders in divisions]
19 (a)		28	**4**	B1 ft from (a) using "k", dep on at least M1
(b)	$24 = \frac{84}{r}$	3.5	**2**	M1 ft from (a) dep on at least M1for putting $p = 24$ into their equation A1 oe eg $\frac{84}{24}$
20 (a) (i)		1	**1**	B1 cao
(ii)		9	**1**	B1 cao
(iii		$\frac{1}{27}$	**2**	B2 (B1 for 27 or knowing negative power is a reciprocal)
(b)	$16n = 4^{\frac{6}{2}}$, $4^2 n = 4^3$ or $4 \times n^{\frac{1}{2}} = 4^{1\frac{1}{2}}$	4	**2**	M1 for correct squaring, or writing $\sqrt{n}$ as $n^{\frac{1}{2}}$ or $4^{\frac{3}{2}} = \sqrt{64}$, 8 or 2^3 A1 cao

GCSE MATHEMATICS
MARK SCHEME – Specimen paper (Linear) Higher Paper 3

Questions	Working	Answer	Mark	Notes
21	$\frac{\frac{4}{3}\pi(3x)^3}{\pi(4x)^2} = \frac{4}{3} \times \frac{3^3}{4^2} x$	$\frac{9x}{4}$	**3**	M1 for substitution in a correct formula, condone missing brackets M1 for a correct equation to find the depth including h and brackets A1 for $\frac{9x}{4}$ oe
22 (a)	$PR = -2\mathbf{a} + 2\mathbf{b}$	$-\mathbf{a} + \mathbf{b}$	**2**	B1 $PR = -2\mathbf{a} + 2\mathbf{b}$ or $\mathbf{a} + \mathbf{b}$ oe B1 oe
(b)	$OQ = 2\mathbf{a} + 2\mathbf{b}$ $OX = OP + PX = 2\mathbf{a} - \mathbf{a} + \mathbf{b} = \mathbf{a} + \mathbf{b} = \frac{1}{2}OQ$		**2**	B1 $OX = OP + PX$ B1 equates $OX = \mathbf{a} + \mathbf{b}$ with $\frac{1}{2}OQ$

Centre No.						Paper Reference								Surname	Initial(s)
Candidate No.											/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Paper 4 (Calculator)

Higher Tier

Specimen paper

Time: 1 hour 45 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator.
Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions in the spaces provided in this question paper.
If you need more space to complete your answer to any question, use additional answer sheets.
You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 26 questions in this question paper. The total mark for this paper is 100.
There are 20 pages in this question paper. Any blank pages are indicated.
Calculators may be used.
If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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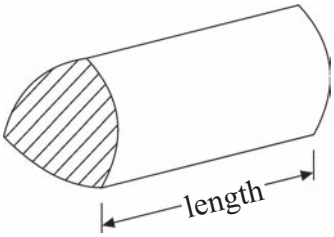
GCSE Mathematics

Formulae: Higher Tier

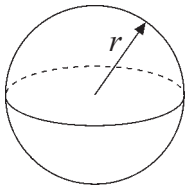
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



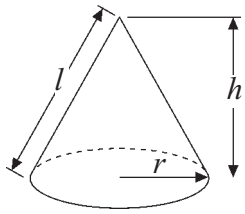
Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$

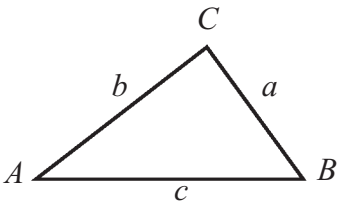


Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$



In any triangle ABC



Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle $= \frac{1}{2}ab\sin C$

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

Leave blank

Answer ALL TWENTY SIX questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. (a) Work out the value of

$$\frac{15.6}{3.3 \times 1.6}$$

Write down all the figures on your calculator display.

.....

(2)

(b) Round your answer to part (a) correct to 3 significant figures.

.....

(1)

Q1

(Total 3 marks)

2. Sally thinks of a number.

She adds 11 to the number.
She then multiplies by 3

Her answer is 60

What number did Sally first think of?

.....

Q2

(Total 2 marks)

Leave blank

3.

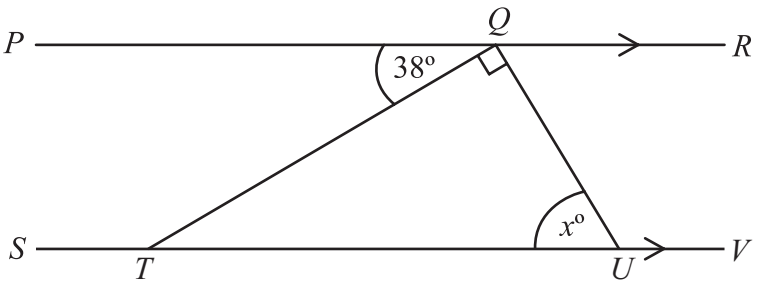


Diagram **NOT** accurately drawn

PQR and *STUV* are parallel straight lines.

(i) Work out the value of the angle marked $x°$.

.....°

(ii) Give reasons for your answer.

.....

.....

Q3

(Total 3 marks)

4. Imran plays a game of chess with his friend.
A game of chess can be won or drawn or lost.

The probability that Imran wins the game of chess is 0.3
The probability that Imran draws the game of chess is 0.25

Work out the probability that Imran loses the game of chess.

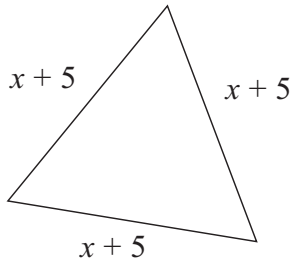
.....

Q4

(Total 2 marks)

Leave blank

5. The length of each side of an equilateral triangle is $(x + 5)$ centimetres.



(a) Find an expression, in terms of x, for the perimeter of the equilateral triangle.
Give your expression in its simplest form.

.....

(2)

The perimeter of the equilateral triangle is 22.5 cm.

(b) Work out the value of x.

.....

(3)

Q5

(Total 5 marks)

Leave blank

6. Michael buys 3 cartons of milk.

The total cost of 3 cartons of milk is £4.20

Work out the total cost of 7 cartons of milk.

£ .....

Q6

(Total 3 marks)

7. Andy sells CDs.
He sells each CD for £8.80 plus VAT at 17 $\frac{1}{2}$ %.

He sells 650 CDs.

Work out how much money Andy gets.

£.....

Q7

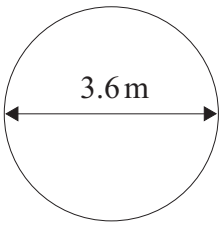
(Total 4 marks)

Leave blank

8. The diagram shows a circle of diameter 3.6 m.

Work out the circumference of the circle.
Give your answer correct to 1 decimal place.

Diagram **NOT** accurately drawn



..... m **Q8**

(Total 2 marks)

9. Change $3.25\,m^3$ to cm^3.

..... cm^3 **Q9**

(Total 2 marks)

10. Solve $4(y+3)=6$

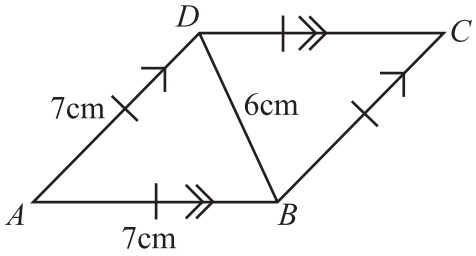
y = ... **Q10**

(Total 3 marks)

Leave blank

11.

Diagram **NOT** accurately drawn



ABCD is a rhombus of side 7 cm.
The length of the diagonal *BD* is 6 cm.

Use ruler and compasses to **construct** the rhombus *ABCD*.
The side *AB* has been drawn for you.
You must show **all** construction lines.

A *B*

Q11

(Total 4 marks)

Leave blank

12. A train travels at a speed of 180 kilometres per hour.
Graham said that 180 kilometres per hour is the same as 50 metres per second.

Show working to show that Graham was correct.

Q12

(Total 3 marks)

13. The equation

$$x^3 + 10x = 51$$

has a solution between 2 and 3
Use a trial and improvement method to find this solution.
Give your answer correct to 1 decimal place.
You must show **all** your working.

Q13

x=.....

(Total 4 marks)

Leave blank

14. Three boys shared £48 in the ratio 5:4:3

Daniel received the smallest amount.

(a) Work out the amount Daniel received.

£ .....

(3)

A year ago, Daniel's height was 1.24 metres.
Daniel's height has now increased by 9.5%.

(b) Work out Daniel's height now.
Give your answer to an appropriate degree of accuracy.

..... m

(4)

Q14

(Total 7 marks)

Leave blank

15.

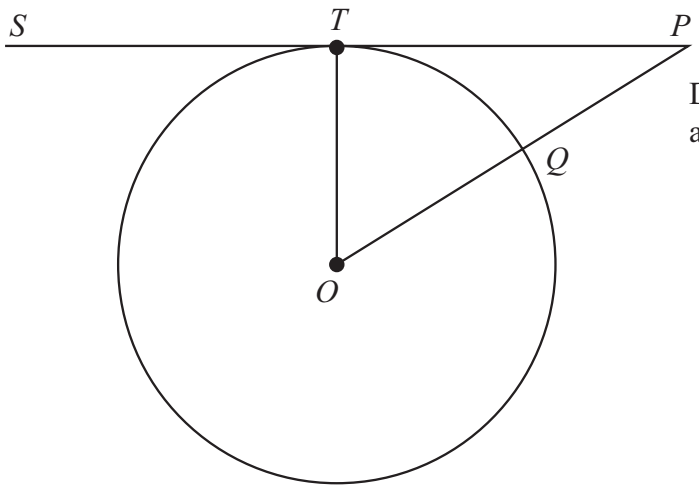


Diagram **NOT** accurately drawn

STP is a tangent to the circle, centre *O*.
Q is a point on the circumference of the circle.
OQP is a straight line.

OP = 26 cm and *TP* = 24 cm.

(a) Angle *OTP* = 90°
Give a reason why.

.....

(1)

(b) Work out the radius *OQ* of the circle.

..... cm

(4)

(c) Work out the area of the circle.
Give your answer correct to 3 significant figures.

..... cm^2

(2)

(Total 7 marks)

Q15

Leave blank

16. The table shows information about the number of hours that 120 children watched television last week.

Number of hours (h)	**Frequency**
$0 < h \leqslant 2$	10
$2 < h \leqslant 4$	20
$4 < h \leqslant 6$	25
$6 < h \leqslant 8$	40
$8 < h \leqslant 10$	15
$10 < h \leqslant 12$	10

(a) Work out an estimate for the mean number of hours that the children watched television last week.

..... hours

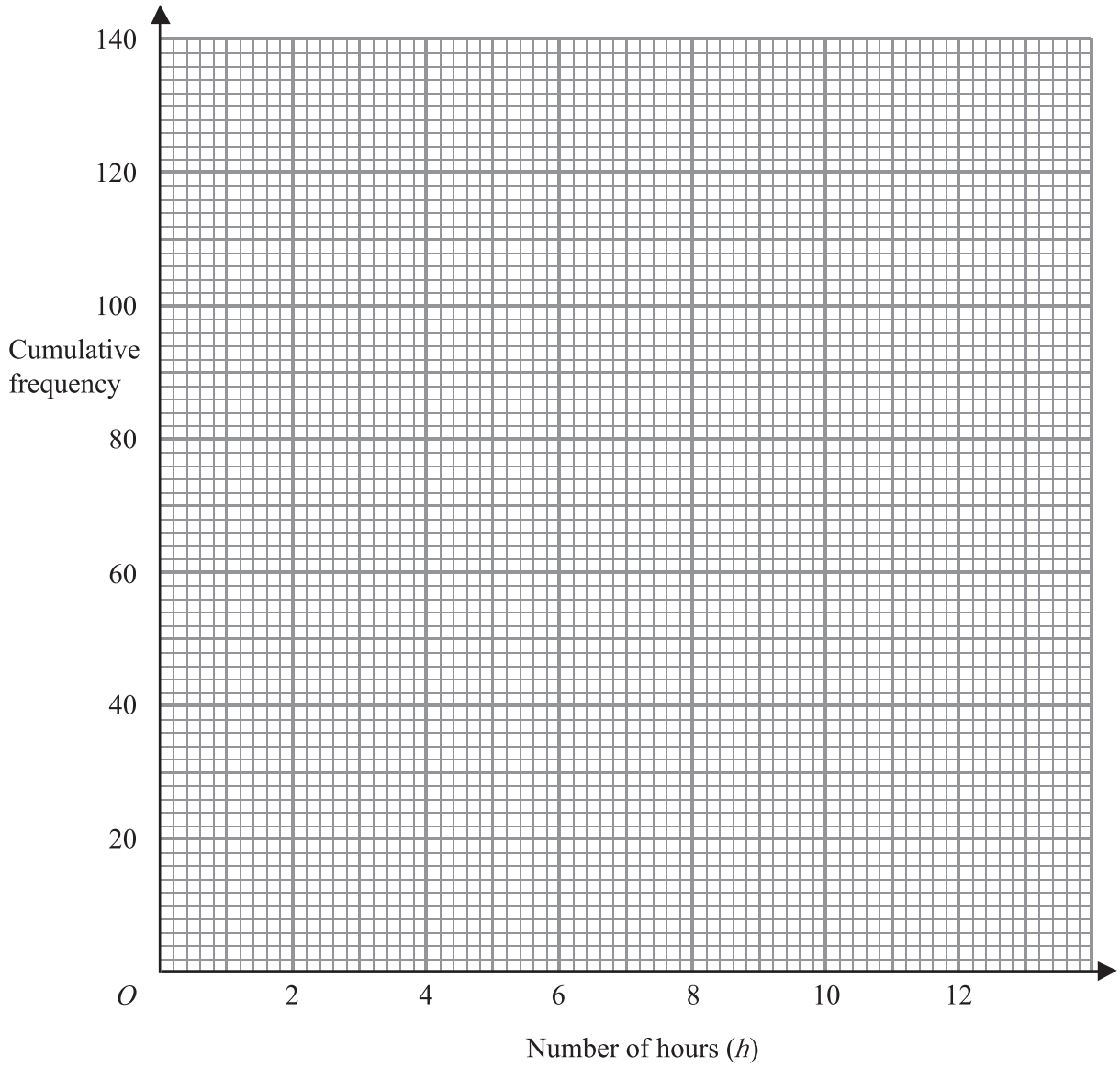
(4)

(b) Complete the cumulative frequency table.

Number of hours (h)	**Cumulative frequency**
$0 < h \leqslant 2$	10
$0 < h \leqslant 4$	
$0 < h \leqslant 6$	
$0 < h \leqslant 8$	
$0 < h \leqslant 10$	
$0 < h \leqslant 12$	

(1)

Leave blank



(c) On the grid, draw a cumulative frequency graph for your table.

(2)

(d) Use your graph to find an estimate for the number of children who watched television for **fewer** than 5 hours last week.

.....

(2)

Q16

(Total 9 marks)

Leave blank

17. Town *B* is 4.5 km due West of town *C*.
Town *A* is 2.4 km due North of town *B*.

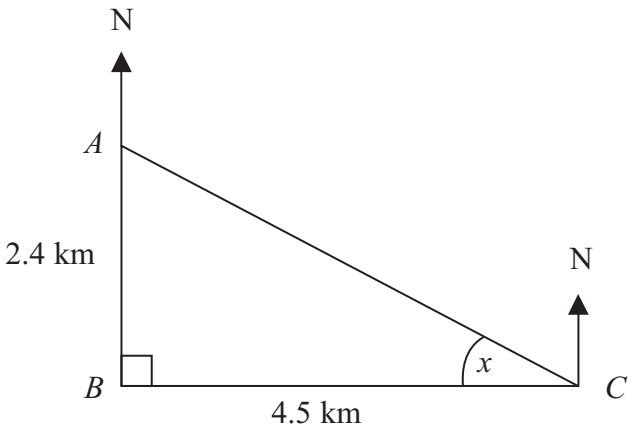


Diagram **NOT** accurately drawn

(a) Calculate the size of the angle marked *x*.
Give your answer correct to 3 significant figures.

x = ... °

(3)

(b) Find the bearing of town *C* from town *A*.
Give your answer correct to 3 significant figures.

..... °

(1)

Q17

(Total 4 marks)

Leave blank

18. (a) Simplify $a^4 \times a^5$

.....

(1)

(b) Simplify $4xy^3 \times 3x^2y$

.....

(2)

(c) Factorise $p^2 - 16q^2$

.....

(2)

Q18

(Total 5 marks)

19. Solve

$$3x - 2y = 3$$
$$x + 4y = 8$$

$x =$ .....

$y =$ .....

Q19

(Total 3 marks)

Leave blank

20. Make t the subject of the formula

$$D = 5t + \pi t + 5w$$

$t =$ .....

Q20

(Total 3 marks)

21.

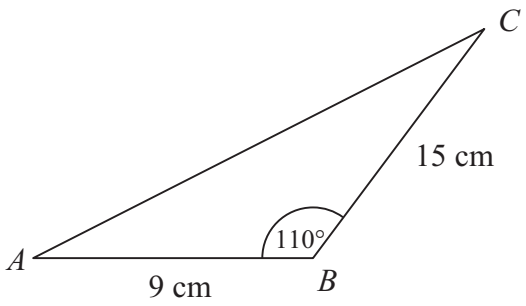


Diagram **NOT** accurately drawn

ABC is a triangle.
$AB = 9$ cm
$BC = 15$ cm
Angle $ABC = 110°$

Calculate the area of the triangle.
Give your answer correct to 3 significant figures.

..... cm^2

Q21

(Total 3 marks)

Leave blank

22. Two boxes contain coloured bricks.
Box A contains 2 red bricks, 3 blue bricks and 1 yellow brick.
Box B contains 3 red bricks, 2 yellow bricks and 1 green brick.

Janet selects one brick from box A and one brick from box B.

Calculate the probability that the two bricks will be of the same colour.

.....

Q22

(Total 3 marks)

Leave blank

23. A painting was valued at £600 on 1 January 2004.
The value of the painting is predicted to increase at a rate of R% per annum.

The predicted value, £V, of the painting after n years is given by the formula

$$V = 600 \times (1.055)^n$$

(a) Write down the value of R.

$R =$.....
(1)

(b) Use your calculator to find the predicted value of the painting after 15 years.

£.....
(2)

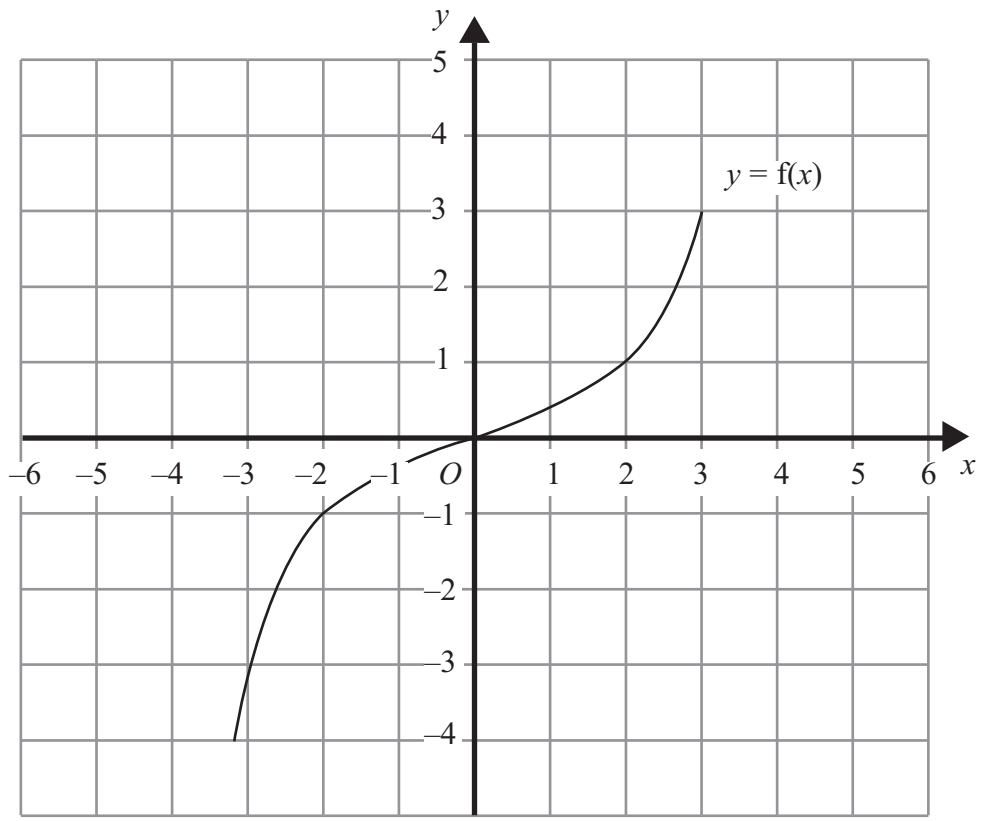
(Total 3 marks)

Q23

Leave blank

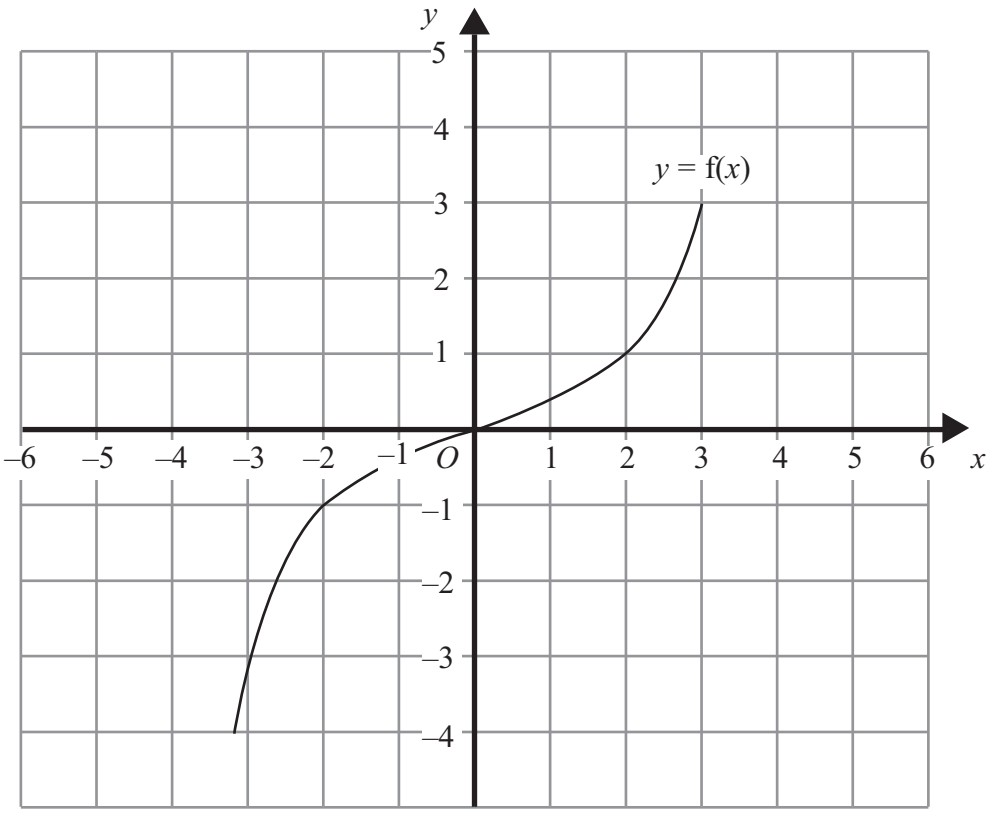
24. The graph of $y = f(x)$ is shown on the grids.

(a) On this grid, sketch the graph of $y = f(x + 3)$



(2)

(b) On this grid, sketch the graph of $y = – f(x)+1$



(2)

Q24

(Total 4 marks)

Leave blank

25. The time period T of a simple pendulum, of length l, is given by the formula

$T = 2\pi\sqrt{\frac{l}{g}}$,where g is the acceleration due to gravity.

The length of a simple pendulum is given as 30 cm correct to 2 significant figures.
The value of g is given as 9.8 correct to 2 significant figures.

Calculate the greatest value of T.
Give your answer correct to 3 significant figures.

.....

Q25

(Total 4 marks)

26. Simplify fully

(a) $(2x^3y)^5$

.....

(2)

(b) $\frac{x^2 - 4x}{x^2 - 6x + 8}$

.....

(3)

Q26

(Total 5 marks)

TOTAL FOR PAPER: 100 MARKS

END

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper (Linear) Higher Paper 4

Questions	Working	Answer	Mark	Notes
1 (a)	15.6/5.28=2.954545	2.9545……	**2**	B2 for 2.9545…… or better (B1 for 5.28 seen or 2.95 or 2.954(5))
(b)		2.95	**1**	B1 ft for 2.95
2	$60 \div 3 = 20$ $20 - 11$	9	**2**	M1 for $\div 3$ or 20 seen or $3(x+11)$ A1 cao
3 (i)	$180 - 90 - 38$	52° Alternate angles on parallel lines and either angles in a triangle or angles on a straight line.	**3**	M1 for $180 - (90 + 38)$ A1 for $x = 52°$ OR B1 for angle $QTU = 38°$ B1 for $x = 52°$ B1 for mention of alternate angles on parallel lines
(ii)				
4	$0.3 + 0.25$ $1 - 0.55$	0.45 oe	**2**	M1 for $1 - (0.3 + 0.25)$ A1 for 0.45 oe [SC:B1 for 0.72]
5 (a)	$x + 5 + x + 5 + x + 5$	$3x + 15$	**2**	M1 for attempting to add $x+5, x+5, x+5$ may be implied by $3x + c, c > 0$ A1 for $3x + 15$ or $3(x + 5)$
(b)	$3x + 15 = 22.5$ $3x = 7.5$ $x = 2.5$	2.5	**3**	M1 for "$3x$ +15" = 22.5 M1 for correct rearrangement and division by "3" A1 cao for 2.5
6	$4.20 \div 3 \times 7$	9.80	**3**	M1 for $4.20 \div 3$ or sight of 1.4 M1 for "1.40" × 7 A1 for 9.8 or equivalent

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper (Linear) Higher Paper 4

Questions	Working	Answer	Mark	Notes
7	$8.80 \times \frac{17.5}{100} = 1.54$ $8.80 + 1.54 = 10.34$ $650 \times$ "10.34"	£ 6 721	**4**	M1 for $8.80 \times \frac{17.5}{100}$ or 1.54 seen or 8.80×1.175 (oe) Award M1 for 10%, 5% and $2\frac{1}{2}$% correctly calculated) M1 for $8.80 +$ "1.54" (dep on previous M1) M1 (indep) for $650 \times$ "10.34" or digits 6721 seen A1 cao OR M1 for 650×8.8 or 5720 seen M1 for "5720" $\times \frac{17.5}{100}$ or 1001 seen (Award M1 for 10%, 5% and $2\frac{1}{2}$% correctly calculated) M1 for "5720"+"1001" (dep on both previous M marks) [or M2 for "5720" $\times 1.175$ (oe)] A1 cao
8	$\pi \times 3.6$	11.3	**2**	M1 For $\pi \times 3.6$ (accept π as 3.1 or better) A1 for 11.16 to 11.32
9	3.25×1000000	3250000	**2**	M1 for 3.25×1000000 or $3.25 \times 100 \times 100 \times 100$ A1 cao

Questions	Working	Answer	Mark	Notes
10	$4y + 12 = 6$ or $y + 3 = \frac{6}{4}$ $4y = -6$ $y = \frac{6}{4} - 3$	-1.5	**3**	B1 for $4y + 12$ or $y + 3 = \frac{6}{4}$ M1 for a correct rearrangement of their 3 terms to isolate $4y$ or y A1 for -1.5 oe
11		Rhombus	**4**	B1 for arcs to locate D B1 for AD drawn B1 for arcs to locate C B1 for complete rhombus, within guidelines [SC:B1 for one correctly drawn 2nd side, if no marks awarded]
12	$\frac{180\times1000}{60\times60} = 50$	50	**3**	M2 for $180 \times 1000 \div 60 \div 60$ or $50 \times 60 \times 60 \div 1000$ or for a correct method to obtain two comparable values eg $50\times60\times60$ **and** 180×1000 A1 for final proof (M1 for $180 \div 60 \div 60$ or $50\times60\times60$ or 180000 seen or for $180\times$ 1000)
13	2.5 → 40.6 (25) 2.6 → 43.5 (76) 2.7 → 46.6 (83) 2.8 → 49.9 (50) 2.9 → 59.3 (89) 2.85→ 51.6 (49)	2.8	**4**	B2 for a trial between 2 and 3 exclusive (B1 for a trial at 2 or 3) B1 for a trial between 2.8 and 2.9 exclusive B1 (dep on at least one previous B1) for 2.8 NB trials should be evaluated to at least 1 dp truncated or rounded

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper (Linear) Higher Paper 4

Questions	Working	Answer	Mark	Notes
14 (a)	$48 \div (5+4+3)$ "4" × 3	12	**3**	M1 for $48 \div (5+4+3)$ M1 (dep) for "4" × 3 or "4"×5 or "4"×4 A1 cao [SC: B2 for 20:16:12 only]
(b)	$1.24 \times \frac{95}{100} = 0.1178$ $1.24 + 0.1178 = 1.3578$	1.36 or 1.4	**4**	M1 for $1.24 \times \frac{95}{100}$ or 0.11(78) seen M1 (dep) for 1.24 +" 0.11(78)" A1 for 1.4 or better B1 (indep) for rounding their answer correctly to 1 or 2dp OR M1 for $1.24 \times \frac{100+9.5}{100}$ M1 (dep) for 1.24 ×"1.095" or 0.0124 ×"109.5" A1 for 1.4 or better B1 (indep) for rounding their answer correctly to 1 or 2dp
15 (a)		Angle between tangent and radius.	**1**	B1
(b)	$26^2 = 24^2 + r^2$ $\sqrt{26^2 - 24^2} = \sqrt{100}$	10	**4**	M1 for $26^2 = 24^2 + r^2$ M1 for $\sqrt{676-576}$ A1 cao B1 for OQ ="10"
(c)	$\pi \times 10^2$	314	**2**	M1 for $\pi \times$"10"^{2} A1 for 314 – 315 inclusive

Questions	Working	Answer	Mark	Notes
16 (a)	$(1 \times 10) + (3 \times 20) + (5 \times 25) +$ $(7 \times 40) + (9 \times 15) + (11 \times 10) = 720$ "720" ÷ 120 = 6	6	**4**	M1 for use of fx with x consistent within intervals (including end points) M1 (dep) for use of midpoints M1 (dep on 1st M1) for use of $\sum fx / \sum f$ A1 cao
(b)		(10), 30, 55, 95, 110, 120	**1**	B1 for all correct
(c)		graph	**2**	B1 ft for 5 or 6 points plotted correctly $\pm\frac{1}{2}$ square (1mm) at the end of interval; dep on a sensible table (condone 1 addition error) B1 (dep) for points joined by a curve or line segments provided no gradient is negative – ignore any part of graph outside range of their points (SC:B1 if 5 or 6 points plotted not at end but consistent within each interval **and** joined)
(d)		39 – 44	**2**	M1 for reading from a cf graph at 5 A1 ft $\frac{1}{2}$ square (1mm) Or B2 for 39 – 44
17 (a)	$\tan x = 2.4/4.5$ $x = \tan^{-1}(2.4/4.5) = 28.1$	28.1	**3**	M1 for $\tan x = \frac{2.4}{4.5}$ or $\tan \frac{2.4}{4.5}$ M1 for $\tan^{-1}(2.4/4.5)$ A1 for 28.0 – 28.1
(b)	90 + "28.1"	118	**1**	B1 (indep) ft for 90 + "28.1" rounded to 3 or 4 sf

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper (Linear) Higher Paper 4

Questions	Working	Answer	Mark	Notes
18 (a)		a^9	**1**	B1 for a^9, accept a^{4+5}
(b)		$12x^3y^4$	**2**	B2 cao (B1 for two of 12, x^3, y^4)
(c)		$(p-4q)(p+4q)$	**2**	B2 for $(p-4q)(p+4q)$ (B1 for $(p \pm 4q)(p \pm 4q)$)
19	Eqn[1] × 2 then add eqn [2] leads to $7x = 14$ Eqn[2] × 3 then subtract from eqn [1] leads to $-14y = -21$	$x = 2$ $y = 1.5$	**3**	M1 for coefficients of x *or* y the same followed by correct operation, condone one arithmetical error M1 (dep) for substituting found value in one equation A1 cao (SC: B1 for one correct answer only if M's not awarded)
20	$D = 5t + \pi t + 5w$ $D - 5w = 5t + \pi t$ $D - 5w = (5 + \pi)t$ OR $D = t(5+\pi) + 5w$ $\frac{D}{5+\pi} = t + \frac{5w}{5+\pi}$	$t = \frac{D-5w}{5+\pi}$ $t = \frac{D}{5+\pi} - \frac{5w}{5+\pi}$	**3**	M1 for subtracting $5w$ from both sides M1 for factorising to get $(5+x)t$ A1 for $t = \frac{D-5w}{5+\pi}$ oe [SC:M1 M1 A0 for $\frac{D-Sw}{8.14}$ oe]
21	Area $\Delta ABC = \frac{1}{2} \times 15 \times 9 \times \sin 110$	63.4	**3**	M1 for $\frac{1}{2} \times 15 \times 9 \times \sin 110$ M1 (dep) for $67.5 \times 0.939(69\ldots)$ or 126.85…. A1 63.4 to 63.5 [SC:B2 for 126.9 or better]

Questions	Working	Answer	Mark	Notes
22	$P = \frac{2}{6}\times\frac{3}{6}+\frac{1}{6}\times\frac{2}{6}$	$\frac{8}{36}$ oe	**3**	M1 for $\frac{2}{6}\times\frac{3}{6}$ *or* $\frac{1}{6}\times\frac{2}{6}$ or for clearly identifying in P(R)×P(R)+P(Y)×P(Y) M1 for $P = \frac{"2"}{6}\times\frac{"3"}{6}+\frac{"1"}{6}\times\frac{"2"}{6}$ A1 for $\frac{8}{36}$ oe
23 **(a)**		5.5	**1**	B1 cao
(b)	$600 \times 1.055^{15} = 1339.48$	1339 to 1340	**2**	M1 for 600×1.055^{15} A1 for 1339 to 1340 (SC:B1 for 739 to 740)
24 **(a)**	Graph translated 3 units to the left passing through the points (–6, –3), (–3, 0), (0, 3), $(-1,1)$, $(-5,-1)$		**2**	M1 for moving 3 horizontal A1 for translation left passing through 3 correct points
(b)	Graph reflected in *x* axis and translated 1 unit in the positive *y*-direction; passing through points (3, –2), (0, 1), (–3, 4), (2, 0), $(-2, 2)$		**2**	B1 for a reflection in *x*-axis B1 for translations of $\begin{pmatrix}0\\1\end{pmatrix}$ passing through 3 correct points

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper (Linear) Higher Paper 4

Questions	Working	Answer	Mark	Notes
25	Upper bound of 30 is 30.5 Lower bound of 9.8 is 9.75 $2 \times \pi \times \sqrt{\frac{30.5}{9.75}}$	11.1	**4**	B1 for 30.5 or 29.5 seen B1 for 9.85 or 9.75 seen M1 for $2\pi\sqrt{\frac{30.5}{9.75}}$ A1 cao
26 (a)		$32x^{15}y^{5}$	**2**	B2 cao (B1 for two of 32, x^{15}, y^{5})
(b)	$\frac{x(x-4)}{(x-2)(x-4)}$	$\frac{x}{x-2}$	**3**	B1 for $x(x-4)$ B1 for $(x-4)(x-2)$ B1 cao

GCSE in Mathematics B
(Modular) 2544

Sample Assessment Material and Mark Schemes

Unit 2: Handling Data

Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Unit 2 – Section A – (Calculator)

Data Handling

Foundation Tier

Specimen Paper

Time: 20 minutes

Materials required for examination

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Items included with question papers

Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 4 questions in this question paper. The total mark for this section is 15.
There are 4 pages in this question paper. Any blank pages are indicated.
Calculators may be used.
If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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SECTION A

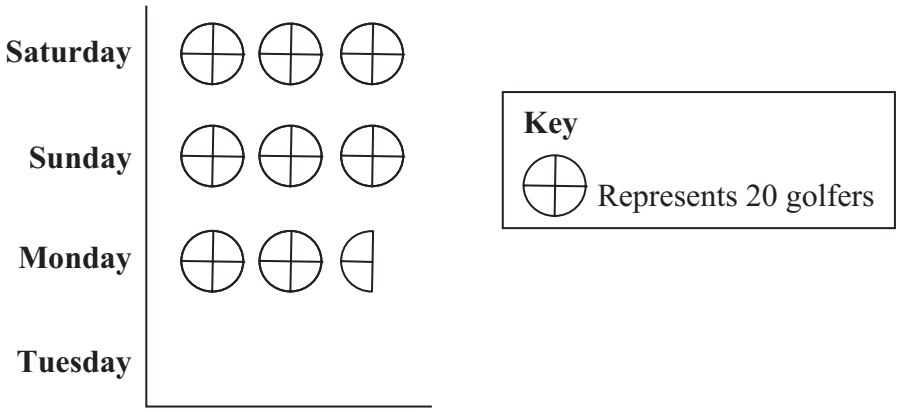
Answer ALL FOUR questions.

Write your answers in the spaces provided.

You may use a calculator in this section.

You must write down all stages in your working.

1. The pictogram shows the number of golfers who played at a golf club last week on Saturday, Sunday and Monday.



(a) How many golfers played on Sunday?

.....

(1)

(b) How many golfers played on Monday?

.....

(1)

On Tuesday, 35 golfers played.

(c) Complete the pictogram.

(1)

Here is a list of the numbers of golfers who played at the club each day over a two week period.

63 72 42 51 38 56 45 67 82 45 64 77 56 49

(d) (i) Find the median.

.....

(ii) Find the range.

.....

(3) **Q1**

(Total 6 marks)

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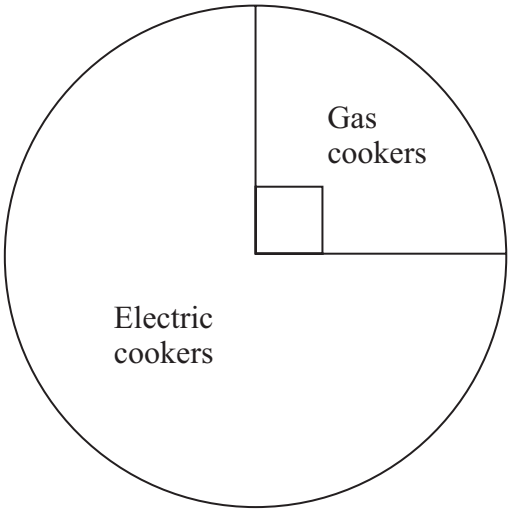
2. A shop sells cookers.
The pie chart shows some information about the number of cookers the shop sold in one year.



The shop sold 150 gas cookers.
Work out the total number of cookers the shop sold.

.....

Q2

(Total 2 marks)

3. Many people take taxis to a club.
One night, the manager at the club recorded the number of people in each taxi as it arrived.

His results are shown in the table.

Number of people	Frequency
1	5
2	9
3	14
4	11
5	5
6	6

Find the mean number of people in a taxi.

.....

Q3

(Total 3 marks)

Leave blank

4. The probability that Asif will pass his driving test at the first attempt is 0.6

(a) Explain why Asif is more likely to pass the test at the first attempt.

.....

.....

(1)

A driving test centre is designing a questionnaire to find out how many hours of driving lessons people have before they take the test.

They have designed this question.

"How long have you been having driving lessons?"

(b) Write down one thing that is wrong with this question.

.....

.....

(1)

(c) Design a better question for the driving centre to use.
You should include some response boxes.

(2) **Q4**

(Total 4 marks)

TOTAL FOR SECTION A: 15 MARKS

END

Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Unit 2 – Section B – (Non-Calculator)

Data Handling

Foundation Tier

Specimen Paper

Time: 20 minutes

Materials required for examination

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers

Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
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There are 4 questions in this question paper. The total mark for this section is 15.
There are 4 pages in this question paper. Any blank pages are indicated.
Calculators must not be used.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
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Return at the end to those you have left out.

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SECTION B
Answer ALL FOUR questions.
Write your answers in the spaces provided.
You must NOT use a calculator for this section.
You must write down all stages of your working.

1. Luigi and Francesca carried out a survey of the vehicles passing their house.
Here are their results.

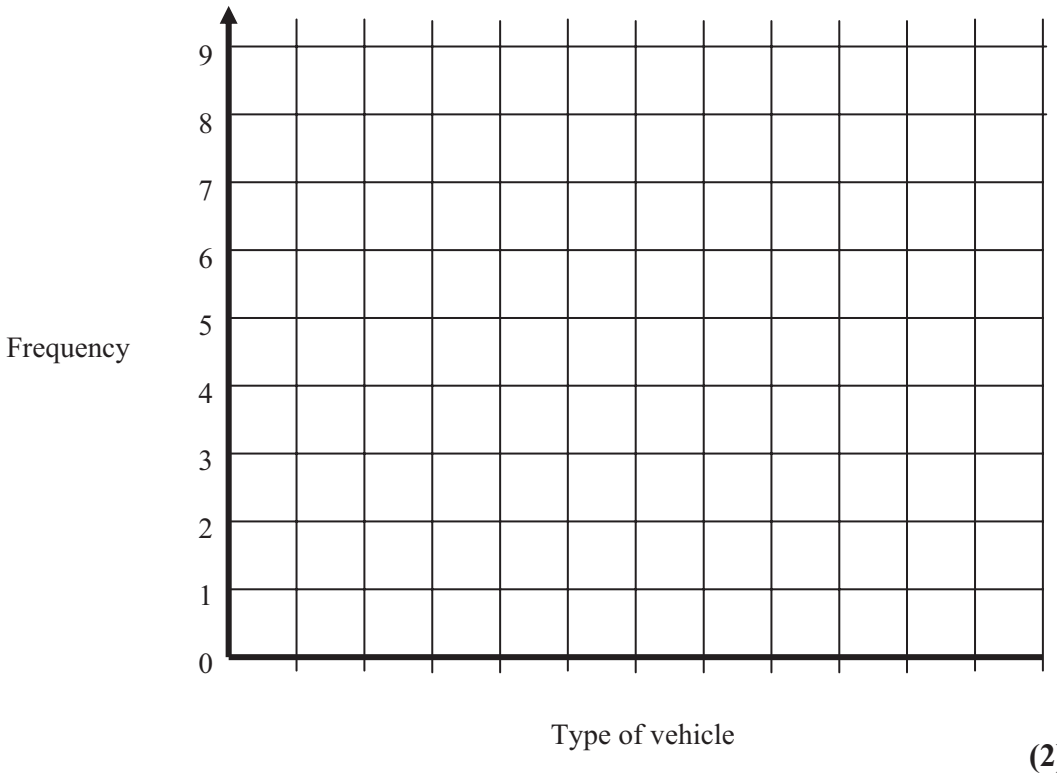
Car	Van	Lorry	Bike	Bus	Car
Van	Car	Car	Van	Lorry	Bike
Bike	Bike	Van	Lorry	Bike	Car
Car	Bus	Lorry	Car	Lorry	Bike

(a) Complete the tally column and frequency column in the frequency table.

Type of vehicle	Tally	Frequency
Car		
Van		
Lorry		
Bike		
Bus		

(2)

(b) Draw a bar chart for this data on the grid.



(2)

(c) Which type of vehicle was most common?

.....

(1)

(Total 5 marks)

Q1

Leave blank

2. Phil rolls a dice and flips a coin.

(a) Make a list of all the possible combinations he could get.

The first one has been done for you.

(6, head) .....

.....

.....

(2)

Phil rolls a dice and flips a coin once.

(b) Work out the probability that he gets a 6 and a head.

.....

(1)

(Total 3 marks)

Q2

3. 60 British students each visited one foreign country last week.

This two-way table shows information about which countries the students visited.

	France	**Germany**	**Spain**	**Total**
Female			9	34
Male	15			
Total		25	18	60

(a) Complete the two-way table.

(3)

One of the students is picked at random.

(b) Write down the probability that this student visited Germany last week.

.....

(1)

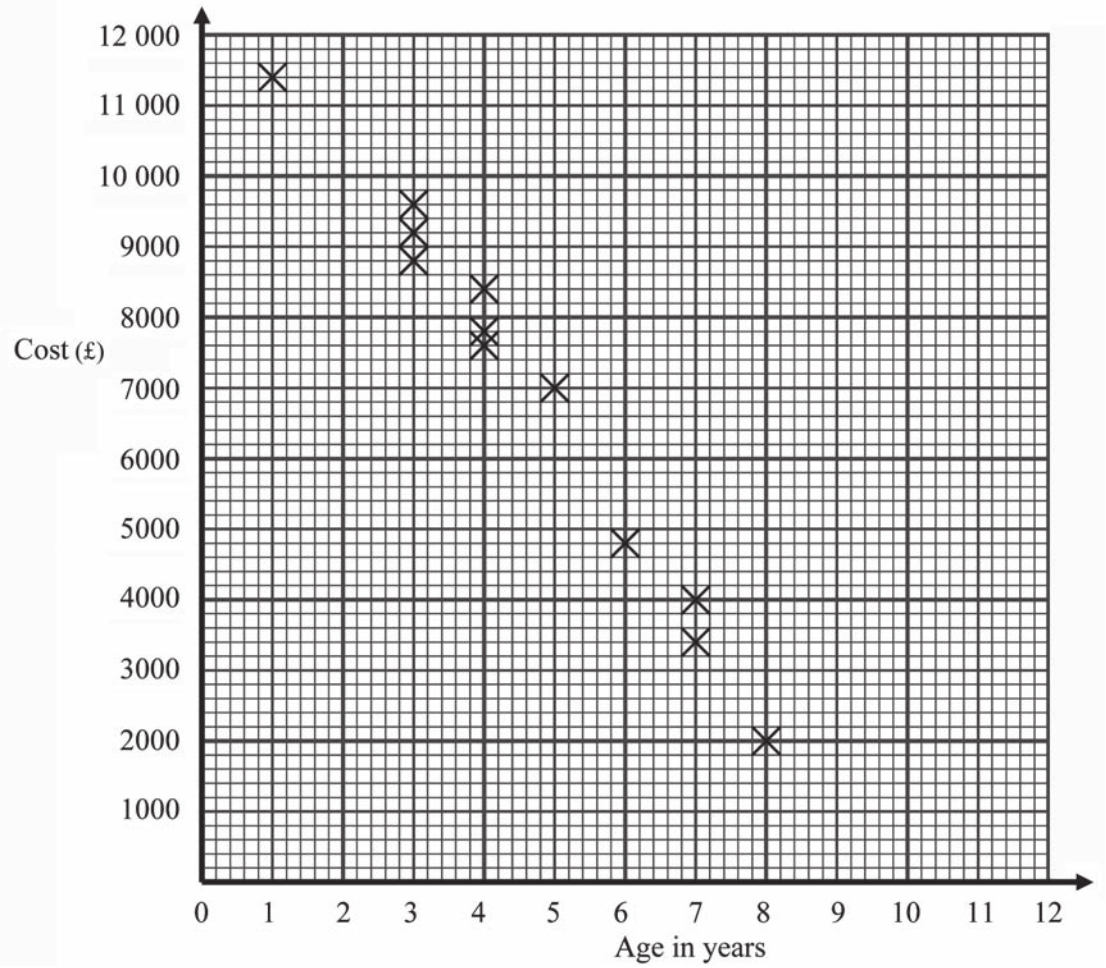
(Total 4 marks)

Q3

Leave blank

4. Tom collects information about the age and cost of some Ford Mondeo cars.

He plots a scatter graph of his results. Here is his graph.



Tom collects data on 3 more Ford Mondeo cars.

Age	2	7	9
Cost (£)	10 000	3000	1000

(a) Plot these points onto the scatter graph.

(1)

(b) What type of correlation does Tom's scatter graph show?

.....

(1)

(c) Draw in a line of best fit onto the scatter graph.

(1)

Q4

(Total 3 marks)

TOTAL FOR SECTION B: 15 MARKS

END

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Handling Data (Unit 2) Foundation

Questions	Working	Answer	Mark	Notes
A1 (a)		60	**1**	B1 cao
(b)		50	**1**	B1 cao
(c)		$1\frac{3}{4}$	**1**	B1 $1\frac{3}{4}$ circles shown
(d) (i)		56	**3**	M1 arrange numbers in order A1 cao
(ii)	82 – 38	44		B1 cao
A2	150 × 4 =	600	**2**	M1 for 150 × 4 A1 cao
A3	(1 × 5) + (2 × 9) + (3 × 14) +(4 × 11) + (5 ×5) + (6 × 6) 5 + 18 + 42 + 44 + 25 + 36 = 170 170 ÷ 50 = 3.4	3.4	**3**	M1 for 1 × 5, 2 × 9 etc (min 3 attempts shown) M1 (dep) for an attempt to add A1 cao
A4 (a)		Reason	**1**	B1 Pass at 0.6 > Fail at 0.4
(b)		Comment	**1**	B1 Comment eg Units? No responses
(c)		Question	**2**	B1 Improved question
		Response		B1 Response boxes

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Handling Data (Unit 2) Foundation

Questions	Working	Answer	Mark	Notes
B1 (a)	Car 𝍸 || 7 Van |||| 4 Lorry 𝍸 4 Bike 𝍸 | 6 Bus || 2		**2**	B1 for all tallies correct B1 for all frequencies correct ft from their tallies
(b)			**2**	B1 for bars labeled appropriately B1 for correct height bars ft from their table
(c)		car	**1**	B1 for cars ft from their highest bar
B2 (a)	(H, 6), (H, 5), (H, 4), (H, 3), (H, 2), (H, 1) (T, 6), (T, 5), (T, 4), (T, 3), (T, 2), (T, 1)		**2**	B2 for fully correct list of 12 B1 for a list that includes H,T and 1 – 6
(b)		$\frac{1}{12}$	**1**	B1 ft from their list
B3 (a)	2 23 2 9 26 17		**3**	B3 for fully correct (B2 for 4 correct) (B1 for 2 correct)
(b)		$\frac{25}{60} = \frac{5}{12}$	**1**	B1 for $\frac{5}{12}$ oe
B4 (a)			**1**	B1 for three points plotted correctly
(b)		Negative	**1**	B1 oe
(c)			**1**	B1 for a line of best fit drawn correctly

Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Unit 2 – Section A (Calculator)

Data Handling

Higher Tier

Specimen Paper

Time: 20 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator.
Tracing paper may be used.

Items included with question papers
Nil

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Calculators may be used.
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SECTION A

Answer ALL FOUR questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. The doorman at a club keeps a record one night of the number of people getting out of each taxi that arrives.

His results are shown in the table.

Number of people	Frequency
1	5
2	9
3	14
4	11
5	5
6	6

Find the mean number of people per taxi.

.....

Q1

(Total 3 marks)

Leave blank

2. The probability that Asif will pass his driving test at the first attempt is 0.6

(a) Explain why Asif is more likely to pass the test at the first attempt than he is to fail at the first attempt.

.....

.....

(1)

A driving test centre is designing a questionnaire.

This question has been designed to find out how many hours of driving lessons have been taken by someone who is about to take a test.

"How long have you spent on driving lessons?"

(b) Design a better question for the driving centre to use.
You should include some response boxes.

(2) **Q2**

(Total 3 marks)

Leave blank

3. John kept a record of the number of birds that visited his bird table over a number of days. This information is shown in the table.

Mon	Tue	Wed	Thu	Fri	Sat
147	161	238	135	167	250

(a) Work out the three-point moving averages for this information.

....

(2)

John measured the time, in seconds, that birds spent on each individual visit to the bird table. Some of this information is shown in the table below and in the histogram opposite.

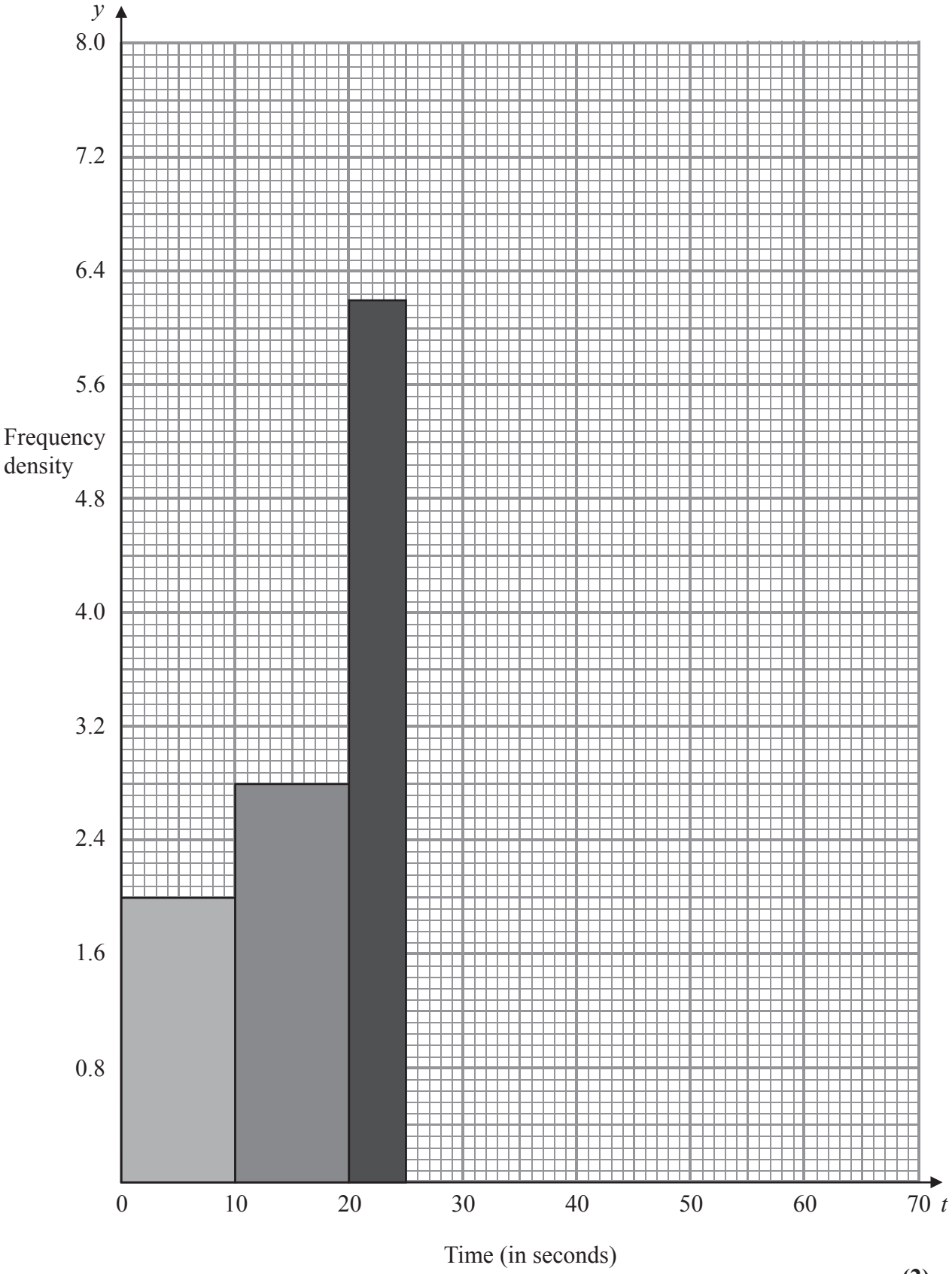
Time (x seconds)	**Frequency**
$0 < x \leqslant 10$	20
$10 < x \leqslant 20$	
$20 < x \leqslant 25$	
$25 < x \leqslant 30$	22
$30 < x \leqslant 50$	12
$x > 50$	0

(b) Use this information to complete the frequency table.

(2)

Leave blank

(c) Use this information to complete the histogram.



(2) **Q3**

(Total 6 marks)

Leave blank

4. Wes gives Bronwen a box of 25 mixed sweets.
12 of them are chocolates, 8 of them are toffees and 5 of them are mints.
All of the sweets have identical wrappers.

Bronwen chooses at random 2 sweets.

What is the probability that Bronwen will choose 2 toffees?

.....

Q4

(Total 3 marks)

TOTAL FOR SECTION A: 15 MARKS

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Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Unit 2 – Section B (Non-Calculator)

Data Handling

Higher Tier

Specimen Paper

Time: 20 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 4 questions in this question paper. The total mark for this section is 15.
There are 8 pages in this question paper. Any blank pages are indicated.
Calculators must not be used.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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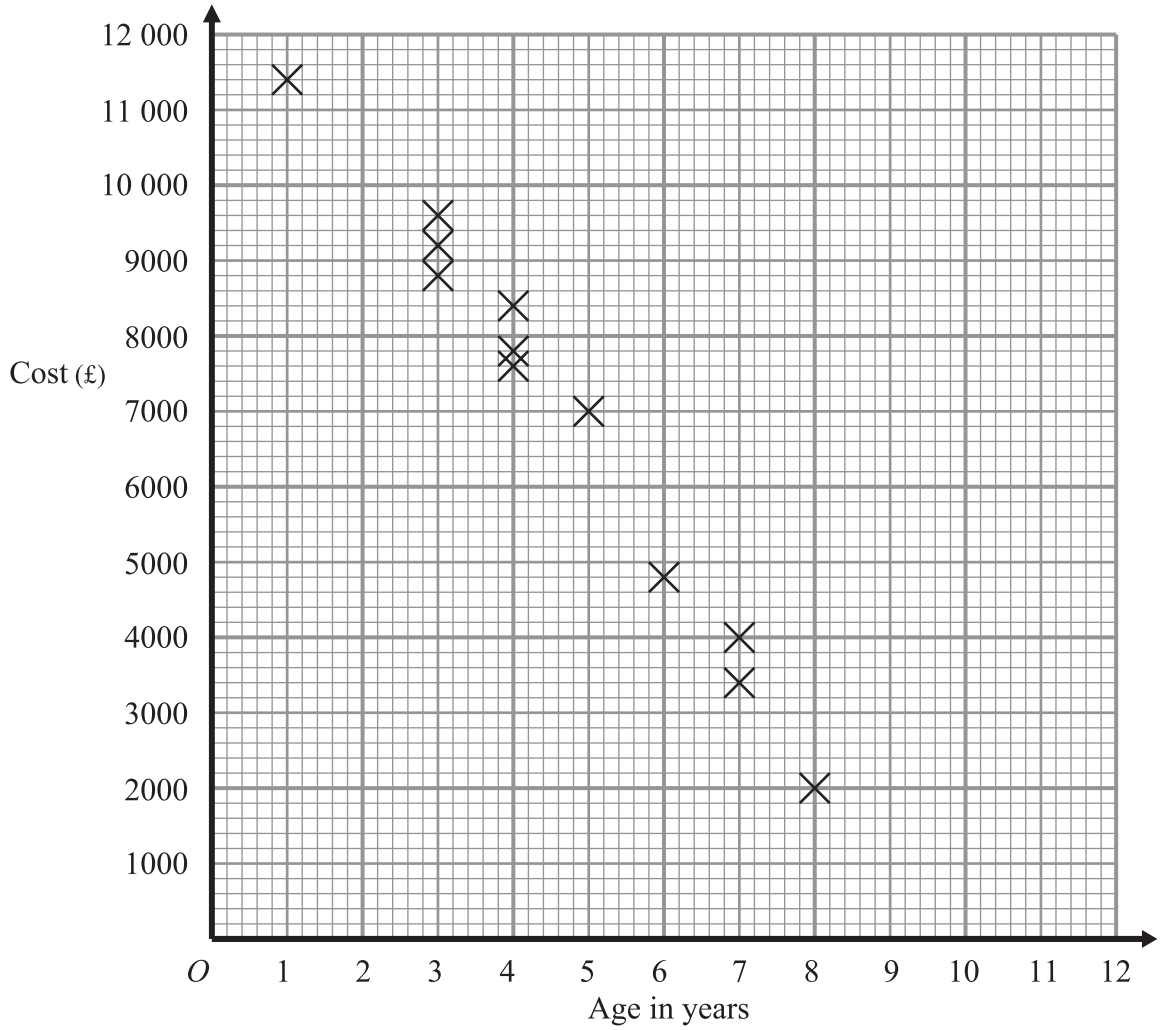
SECTION B

Answer ALL FOUR questions.
Write your answers in the spaces provided.
You must NOT use a calculator for this section.
You must write down all stages of your working.

1. Tom collects information about the age and cost of some Ford Mondeo cars.

He plots a scatter graph of his results. Here is his graph.



Tom collects data on 3 more Ford Mondeo cars.

Age	2	7	9
Cost (£)	10 000	3000	1000

(a) Plot these points onto the scatter graph.

(1)

(b) What type of correlation does Tom's scatter graph show?

.....

(1)

(c) Draw a line of best fit on the scatter graph.

(1)

Leave blank

(d) Use your line of best fit to estimate

(i) the cost of a $5\frac{1}{2}$ year old Ford Mondeo.

£ .....

(ii) the age of a Ford Mondeo that cost £6 000

..... years

(2)

Q1

(Total 5 marks)

2. The manager at "Wheels R Us" recorded the time in minutes it took to change the wheels on cars using his garage.

Here are his results.

25	34	12	8	6	21	18	14	16	22
21	15	16	32	9	15	18	21	12	8

(i) Draw a stem and leaf diagram to show these results.

Key: 1 | 4 = 14

(ii) Find the median time.

Q2

(Total 4 marks)

Leave blank

3. The cumulative frequency table shows the ages of 160 employees of an IT company.

Age (A) in years	Cumulative frequency
$15 < A \leqslant 25$	44
$15 < A \leqslant 35$	100
$15 < A \leqslant 45$	134
$15 < A \leqslant 55$	153
$15 < A \leqslant 65$	160

(a) On the grid opposite, draw a cumulative frequency graph for your table.

(2)

Another IT company has 80 employees.

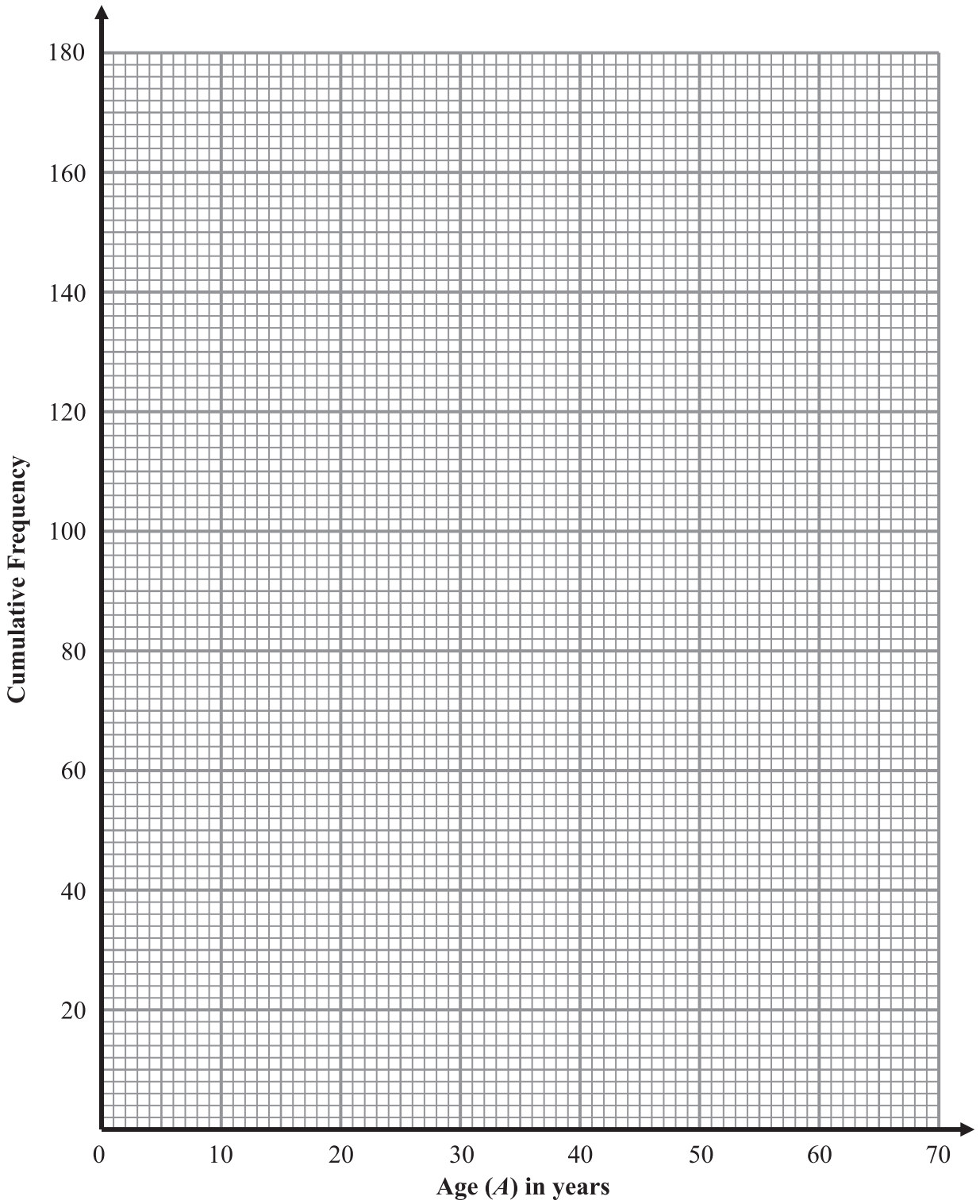
The age of the youngest employee is 24 years.
The age of the oldest employee is 54 years.

The median age is 38 years.
The lower quartile age is 30 years.
The upper quartile age is 44 years.

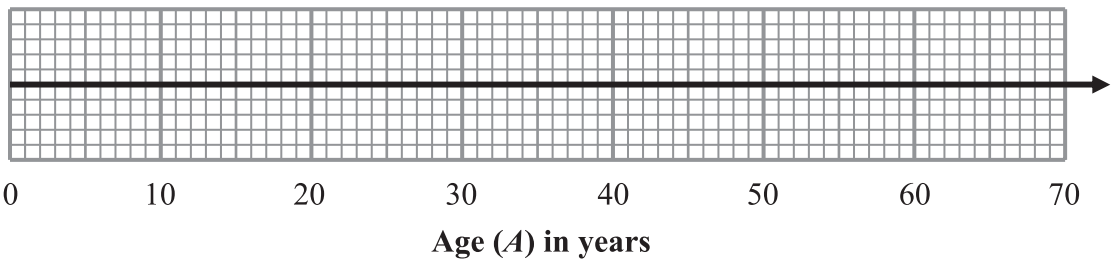
(b) On the grid opposite draw a box plot to show information about the ages of the employees.

(2)

Leave blank



Grid for part (b)



Q3

(Total 4 marks)

Leave blank

4. There are 800 pupils at Hightier School.
The table shows information about the pupils.

Year group	Number of boys	Number of girls
7	110	87
8	98	85
9	76	74
10	73	77
11	65	55

An inspector is carrying out a survey into pupils' views about the school. She takes a sample, stratified both by Year group and by gender, of 50 of the 800 pupils.

Calculate the number of Year 9 boys to be sampled.

.....

Q4

(Total 2 marks)

TOTAL FOR SECTION B: 15 MARKS

END

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GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Handling Data (Unit 2) Higher

Questions	Working	Answer	Mark	Notes
A1	$(1 \times 5) + (2 \times 9) + (3 \times 14) + (4 \times 11) + (5 \times 5) + (6 \times 6)$ $5 + 18 + 42 + 44 + 25 + 36 = 170$ $170 \div 50 = 3.4$	3.4	**3**	M1 for 1×5, 2×9 etc (min 3 attempts shown) M1 (dep) for an attempt to add A1 cao
A2 (a)		Reason	**1**	B1 Pass at 0.6 > Fail at 0.4
(b)		Question Response	**2**	B1 Improved question B1 Response boxes
A3 (a)	182, 178, 180, 184	182,178 180,184	**2**	M1 for one mean eg $(147 + 161 + 238) \div 3$ or sight of one 3-point average A1 cao
(b)		28 31	**2**	B1 cao B1 cao
(c)		11 cm 1.5 cm	**2**	B1 for 4th column 11 cm high B1 for 5th column 1.5 cm high
A4	$\frac{8}{25} \times \frac{7}{24}$	$\frac{7}{75}$	**3**	M1 for $\frac{8}{25} \times$ A1 for $\frac{7}{24}$ A1 $\frac{7}{75}$ oe (eg 0.093)

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Handling Data (Unit 2) Higher

Questions	Working	Answer	Mark	Notes
B1 **(a)**			**1**	B1 for three points plotted correctly
(b)		Negative	**1**	B1 oe
(c)			**1**	B1 for a correct line of best fit
(d)		£5000	**1**	B1 ± 200
(e)		3	**1**	B1 ± 0.2
B2 **(i)**	0 | 6 8 8 9 1 | 2 2 4 5 5 6 6 8 8 2 | 1 1 1 2 5 3 | 2 4	Diagram	**2**	B2 for fully correct (B1 for 2 errors in leaves or omitted key or unordered)
(ii)		16	**2**	B1 for putting in order A1 cao
B3 **(a)**		Graph	**2**	B1 for (4 pts) correctly plotted B1 for curve provided no gradient is negative
(b)		Boxplot	**2**	B2 if fully correct (B1 for median or range end points or interquartile range correct)
B4	Y9 boys in sample: $\frac{76}{800}\times 50$	5	**2**	M1 for $\frac{76}{800}\times 50$ or 4.75 seen A1 for 5

Unit 3: Number, Algebra and Shape, Space and Measures 1

Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Unit 3 – Section A (Calculator)

Foundation Tier

Specimen Paper

Time: 30 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator.
Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 8 questions in this question paper. The total mark for this section is 25.
There are 8 pages in this question paper. Any blank pages are indicated.
Calculators may be used.
If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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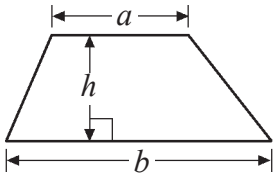
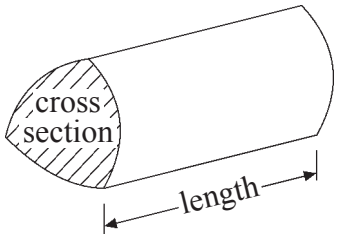
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



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SECTION A

Answer ALL EIGHT questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. (a) Write down the number 1540 in words.

.....

(1)

(b) Write down the value of the 7 in the number 9704

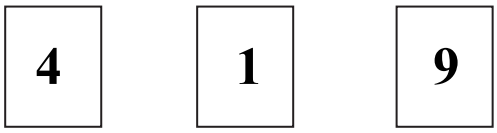
.....

(1)

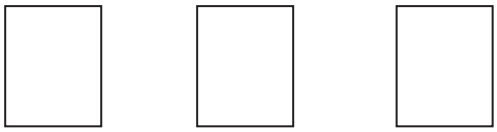
Q1

(Total 2 marks)

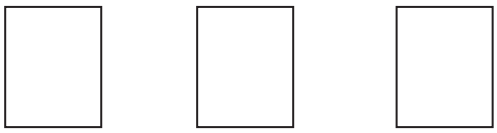
2. There are three cards with numbers on.
The cards are placed to make the number 419



(a) (i) Write the numbers 4, 1, 9 on the cards below to give the **highest** possible number.



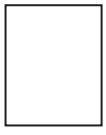
(ii) Write the numbers 4, 1, 9 on the cards below to give the **lowest** possible number.



(2)

One extra card is needed to make the number 419 ten times bigger.

(b) Write the extra number on this card.



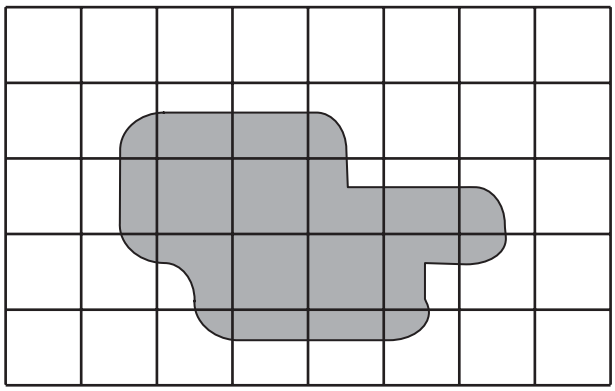
(1)

Q2

(Total 3 marks)

Leave blank

3.



The shaded shape on the diagram represents the surface of a lake in winter.
The lake is drawn on a cm^2 grid.

(a) Estimate the area, in cm^2, of the shaded shape.

..... cm^2
(2)

Each square on the grid represents a square with sides of length 100 m.

(b) Work out the area, in m^2, represented by one square on the grid.

..... m^2
(2)

(c) Estimate the area, in m^2, of the lake.

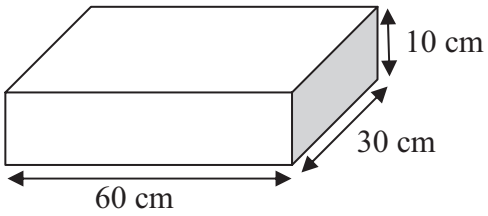
..... m^2
(1)

(Total 5 marks)

Q3

Leave blank

4. **Large box**



Match box

Diagram **NOT** accurately drawn

The diagram shows a large box in the shape of a cuboid and a matchbox.

The large box is full of match boxes.
Each match box is in the shape of a cuboid.
Each match box is 6 cm by 3 cm by 1 cm.

Work out the number of match boxes in the large box.

.....

(Total 3 marks)

Q4

Leave blank

5. (a) $a = 4$

$b = -3$

Work out the value of $3a + 2b$

.....

(2)

(b) Expand $3(4x - 1)$

.....

(1)

(c) n is a whole number.
What type of whole number is $2n$?

.....

(1)

(d) Expand and simplify $2(3y + 4) + 3(y - 1)$

.....

(2) **Q5**

(Total 6 marks)

6. A is the point (4, 3)

B is the point (–2, 1)

Find the coordinates of the midpoint of the line AB.

(..... , ...) **Q6**

(Total 2 marks)

Leave blank

7. Write as a power of 7

(i) $7^5 \times 7^3$

.....

(ii) $7^{10} \div 7^4$

.....

Q7

(Total 2 marks)

8. Use your calculator to work out

$$\frac{\sqrt{13.4-6.8}}{2.4+5.7}$$

Write down all the figures on your calculator display.

.....

Q8

(Total 2 marks)

TOTAL FOR SECTION A: 25 MARKS

END

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Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Unit 3 – Section B (Non-Calculator)

Foundation Tier

Specimen Paper

Time: 30 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 9 questions in this question paper. The total mark for this section is 25.
There are 8 pages in this question paper. Any blank pages are indicated.
Calculators must not be used.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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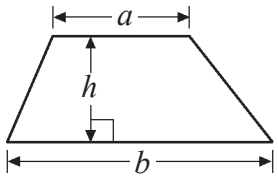
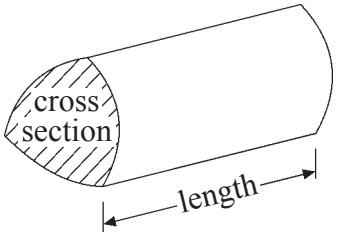
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



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SECTION B

Answer ALL NINE questions.
Write your answers in the spaces provided.
You must NOT use a calculator.
You must write down all stages in your working.

1. Natasha had one pound sixty pence.

Her friend, Kelly, had two pounds five pence.

Write down, in figures, how much money Kelly and Natasha each had.

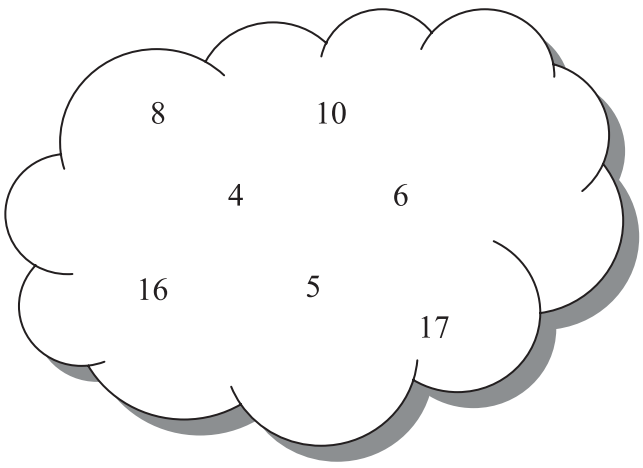
Natasha £ .....

Kelly £ .....

(Total 2 marks)

Q1

2.



From the numbers in the cloud, write down

(i) an odd number, ...

(ii) a multiple of 4, ...

(iii) a prime number. .....

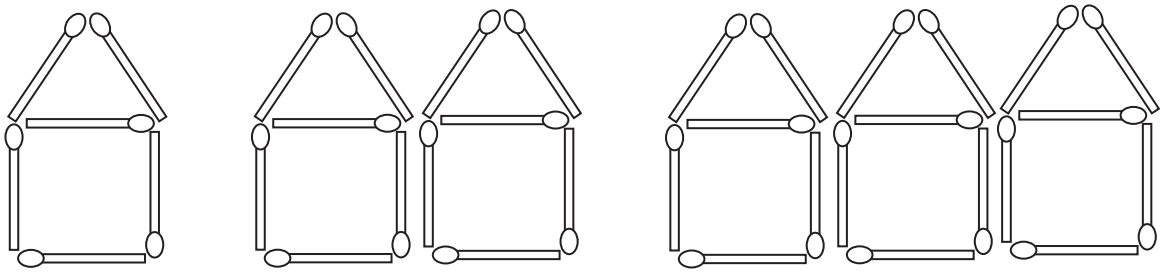
(iv) a number with a factor of 3 .....

(Total 4 marks)

Q2

Leave blank

3. Here are some patterns made from matchsticks.



Pattern number 1 Pattern number 2 Pattern number 3

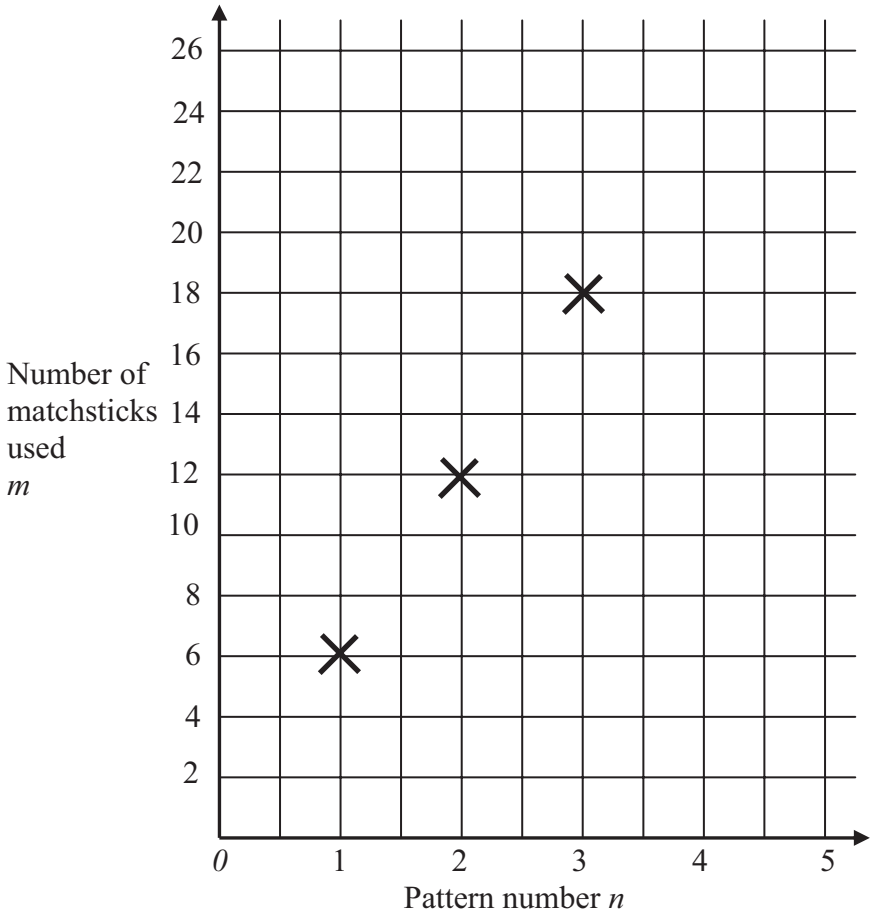
(a) In the space below, draw Pattern number 4

(1)

Leave blank

The graph shows the number of matchsticks m in pattern number n.

(b) Mark the point showing the number of matchsticks used in Pattern number 4



(1)

(c) How many matchsticks are used in Pattern number 10?

.....

(1)

(d) Write down a formula for m in terms of n.

.....

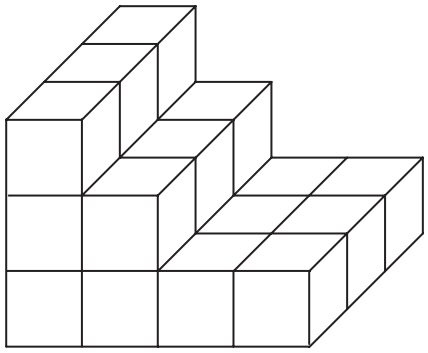
(1)

Q3

(Total 4 marks)

Leave blank

4. The prism below is made from centimetre cubes.
Work out the volume of this prism.



..... cm^3

(Total 1 mark)

Q4

5. Write these numbers in order of size.

Start with the smallest number.

(i) 5, –6, –10, 2, –4

.....

(ii) $\frac{1}{2}, \frac{2}{3}, \frac{2}{5}, \frac{3}{4}$

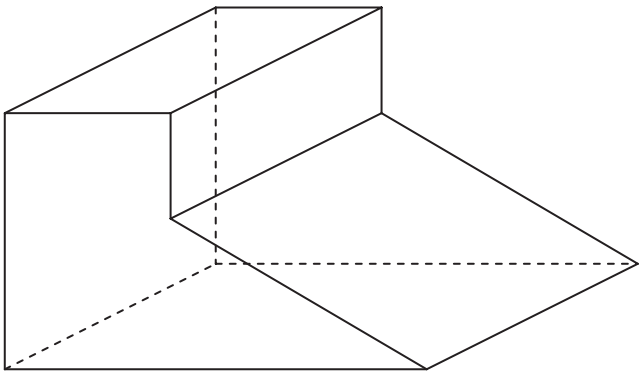
.....

(Total 3 marks)

Q5

Leave blank

6. Here is a solid shape.



Write down the number of;

(i) faces,

..... faces

(ii) edges,

..... edges

(iii) vertices.

..... vertices

(Total 3 marks)

Q6

7. Simon drives 28 miles every day.

There were 365 days in 2005.

How many miles did Simon drive in 2005?

..... miles

(Total 3 marks)

Q7

Leave blank

8.

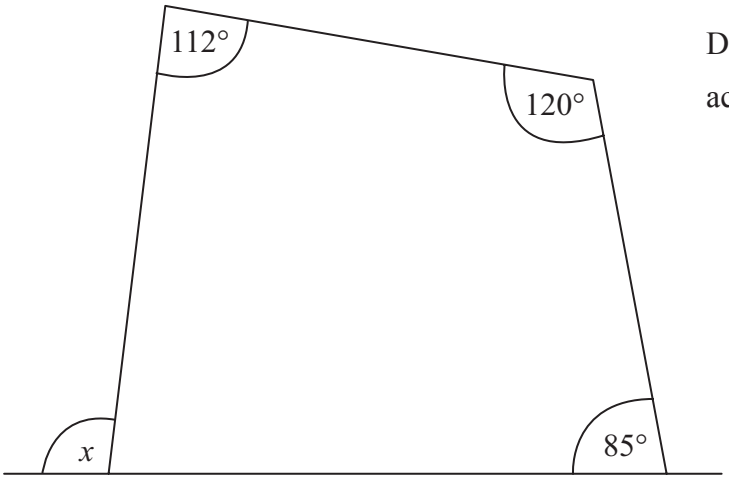


Diagram **NOT** accurately drawn

Work out the size of angle x.

x = ... °

Give reasons for your answer.

.....

.....

.....

Q8

(Total 3 marks)

9.

$$\frac{3}{5} \quad \frac{3}{7} \quad \frac{3}{8} \quad \frac{3}{10} \quad \frac{3}{11}$$

Bronwyn converted each of these fractions to decimals.
Some of these fractions gave a recurring decimal.

Put a ring around each of these fractions.

Q9

(Total 2 marks)

TOTAL FOR SECTION B: 25 MARKS

END

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – NA/SSM (Unit 3) Foundation

Questions	Working	Answer	Mark	Notes
A1 (a)	1540 in words		**2**	B1 cao
(b)	700 or hundreds	700		B1 cao
A2 (a) (i)		941	**2**	B1 cao
(ii)		149		B1 cao
(b)		0	**1**	B1 cao
A3 (a)		11	**2**	B2 10.5 to 11.5 (B1 for 10 to 10.5 or 11.5 to 12)
(b)	100 × 100	10000	**2**	M1 for 100^2 A1 cao
(c)	11 × 10000	110000	**1**	B1 ft "(a)" × "(b)"
A4 (a)	60 × 30 × 10 = 18000 18000 ÷ 18	1000	**3**	M1 for 60 × 30 × 10 or 18000 seen M1 for 18000 ÷ 18
(b)	Or 10 × 10 × 10			A1 cao
A5 (a)	(3 × 4) + (2 × – 3)	6	**2**	B2 cao B1 3 × 4 and 2 × – 3 seen
(b)		$12x - 3$	**1**	B1 cao
(c)		Even	**1**	B1 cao
(d)	6y + 8 + 3y – 3	9y + 5	**2**	M1 for 6y + 8 + 3y – 3 A1 cao
A6	$\frac{4-2}{2}, \frac{3+1}{2}$	(1, 2)	**2**	B2 (B1 for $x = 1$ or $y = 2$)
A7 (i)		7^8	**2**	B1 cao
(ii)		7^6		B1cao
A8	2.5690 ÷ 8.1	0.317166	**2**	B1 for 2.569… as numerator, or 8.1 as denominator B1 to a min of 6 dp

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – NA/SSM (Unit 3) Foundation

Questions		Working	Answer	Mark	Notes
B1	**(i)**	Natasha	£1.60	**1**	B1 cao
	(ii)	Kelly	£2.05	**1**	B1 cao
B2	**(i)**		5 or 17	**1**	B1 for either 3 or 17
	(ii)		4, 8, 16	**1**	B1 for either 4, 8 or 16
	(iii		5 or 17	**1**	B1 for either 5 or 17
	(iv		6	**1**	B1 for 6
B3	**(a)**			**1**	B1 for correct pattern
	(b)			**1**	B1 for (4, 24) plotted
	(c)		60	**1**	B1 for 60 matches
	(d)		$m = 6n$	**1**	B1 for $m = 6n$
B4			21	**1**	B1 for 21
B5	**(i)**	$-10, -6, -4, 2, 5$		**1**	B1 cao
	(ii)	$\frac{2}{5}, \frac{1}{2}, \frac{2}{3}, \frac{3}{4}$		**2**	B2 for all correct (B1 for one out of order)
B6	**(i)**		7	**1**	B1 for 7 faces
	(ii)		15	**1**	B1 for 15 edges
	(iii		10	**1**	B1 for 10 vertices
B7		365 28 2920 7300 10220	10220	**3**	B3 for complete method leading to correct answer (B2 for complete method condone one error in either addition or multiplication) (B1 for complete method condoning two errors in either addition or multiplication or one in each)
B8		Angle $ABP = 63°$ (Angles in a quadrilateral) Angle $CBQ = 117°$ (Angles on a straight line)	117°	**3**	M1 for Angle $ABP = 63°$ (Angles in a quadrilateral) M1 for Angle $CBQ = 117°$ (Angles on a straight line) A1 cao
B9			$\frac{3}{7}, \frac{3}{11}$	**2**	B2 cao (B1 for 1 correct fraction)

Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Unit 3 – Section A (Calculator)

Higher Tier

Specimen Paper

Time: 30 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 7 questions in this question paper. The total mark for this section is 25.
There are 8 pages in this question paper. Any blank pages are indicated.
Calculators may be used.
If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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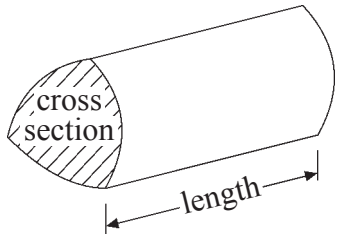
Formulae: Higher Tier

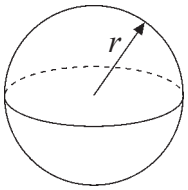
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



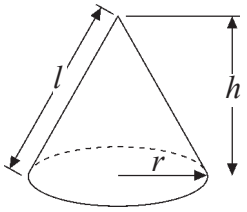
Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$

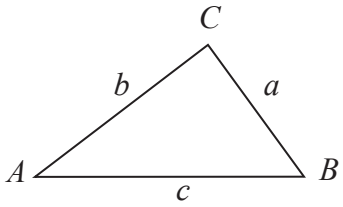


Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$



In any triangle ABC



Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle $= \frac{1}{2}ab\sin C$

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

Leave blank

SECTION A

Answer ALL SEVEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1.

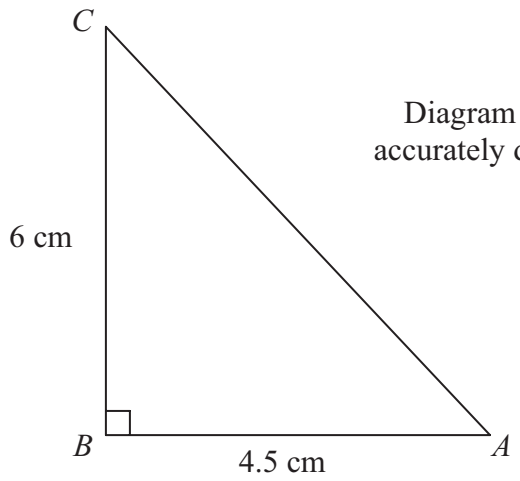


Diagram **NOT** accurately drawn

(a) Calculate the area of the triangle.

..... cm^2

(2)

The sides *AB* and *BC* are each measured, correct to the nearest millimetre.

(b) (i) Write down the **least** possible length of the side *AB*.

..... cm

(ii) Write down the **greatest** possible length of the side *AB*.

..... cm

(2) **Q1**

(Total 4 marks)

Leave blank

2. Use your calculator to work out

$$\frac{\sqrt{13.4-6.8}}{2.4+5.7}$$

Write down all the figures on your calculator display.

.....

Q2

(Total 2 marks)

3. (a) Expand $3(4x - 1)$

.....

(1)

(b) Expand $y(y + 2)$

.....

(1)

(c) Expand and simplify $2(3z + 4) + 3(z - 1)$

.....

(2)

(d) Expand and simplify $(x + 2y)(x - 3y)$

.....

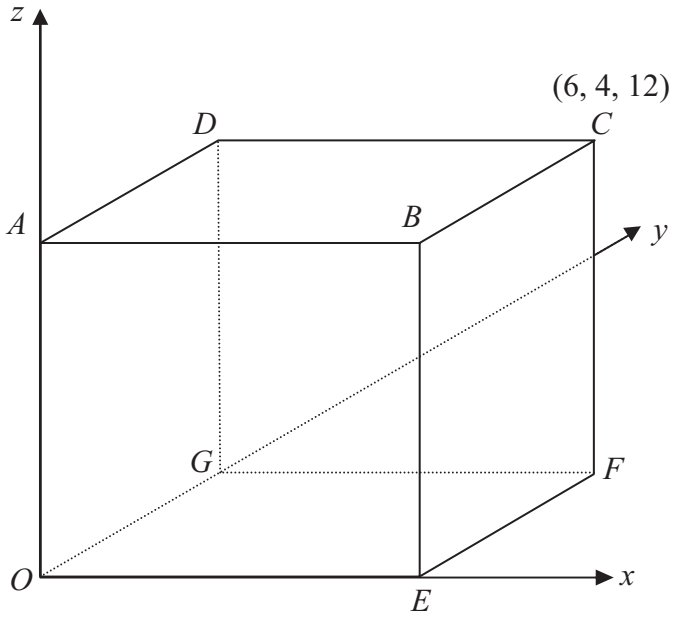
(2)

Q3

(Total 6 marks)

Leave blank

4.



The diagram shows a cuboid.

The coordinates of the vertex C are (6, 4, 12).

(a) Write down the coordinates of

(i) the vertex B,

(..... , ... , ...)

(ii) the vertex F.

(..... , ... , ...)

(2)

(b) Find the coordinates of the midpoint of OD.

(..... , ... , ...)

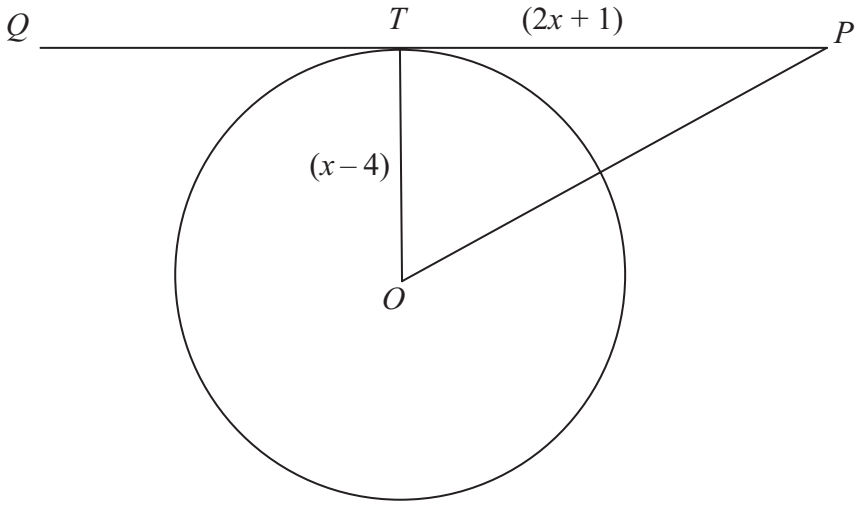
(2)

Q4

(Total 4 marks)

Leave blank

5.



QTP is a tangent to the circle, centre *O*.
OT is a radius of length $(x - 4)$ cm.
$PT = (2x + 1)$ cm.
A is the area of triangle *PTO*.

(a) Show that $A = x^2 - 3.5x - 2$

(4)

(b) Explain why *PT* must be greater than 9

.....

(1) **Q5**

(Total 5 marks)

Leave blank

6. 1 m^3 of wheat grain weighs 0.766 tonnes.
The volume of a storage tank is 254 m^3.

Calculate the weight, in tonnes, of wheat grain in this storage tank when it is full.

..... tonnes

(Total 2 marks)

Q6

7. Cleo used a pair of scales to measure, in kilograms, the weight of a brick.

The scales were accurate to the nearest 100 g.

She read the scales as accurately as she could and wrote down the weight as 1.437 kg.

Anthony said that this was not a sensible weight to write down.
Explain why Anthony was correct.

.....

.....

.....

(Total 2 marks)

Q7

TOTAL FOR SECTION A: 25 MARKS

END

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Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Unit 3 – Section B (Non-Calculator)

Higher Tier

Specimen Paper

Time: 30 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 7 questions in this question paper. The total mark for this section is 25.
There are 8 pages in this question paper. Any blank pages are indicated.
Calculators must not be used.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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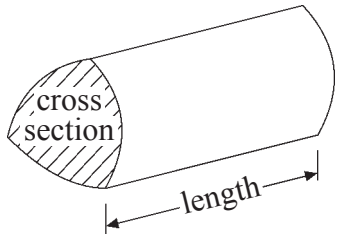
Formulae: Higher Tier

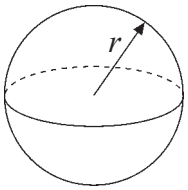
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



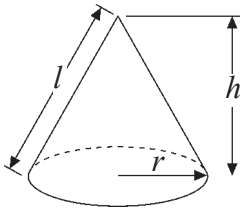
Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$

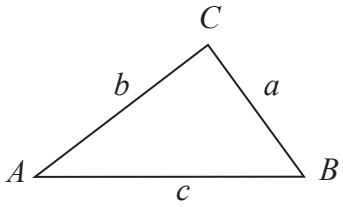


Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$



In any triangle ABC



Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle $= \frac{1}{2}ab\sin C$

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

Leave blank

SECTION B

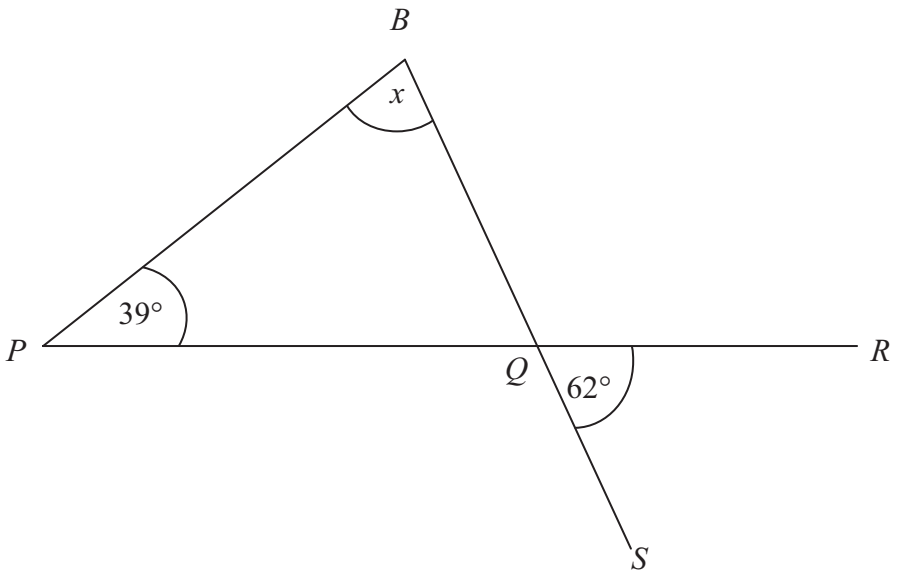
Answer ALL SEVEN questions.

Write your answers in the spaces provided.

You must NOT use a calculator for this section.

You must write down all stages in your working.

1.



Work out the size of angle x.

x = ...°

Give reasons for your answer.

.....

.....

.....

Q1

(Total 3 marks)

2. Given that

$3600 \times 5.8 = 20\,880$

Write down the value of

(i) 36×0.58

.....

(ii) $2.088 \div 36$

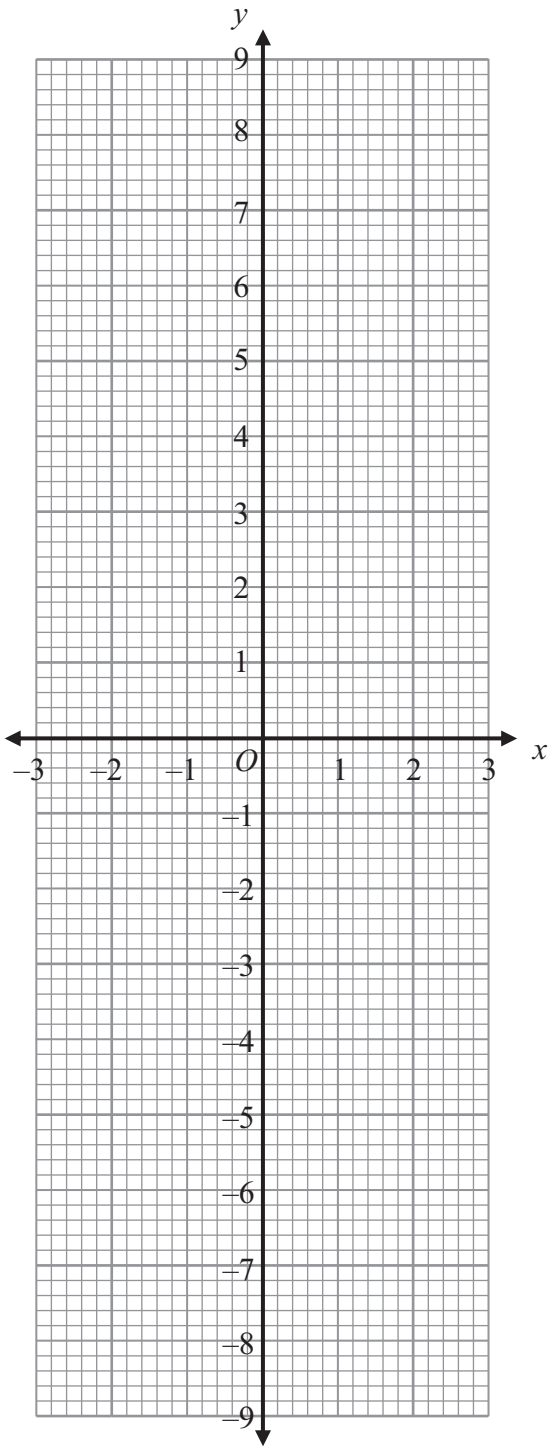
Q2

.....

(Total 2 marks)

Leave blank

3. (a) On the grid, draw the graph of $y = 2x - 3$
Use values of x between -3 and $+3$



(3)

(b) On the same grid draw the graph of $y = 2x + 1$

(1)

Q3

(Total 4 marks)

Leave blank

4.

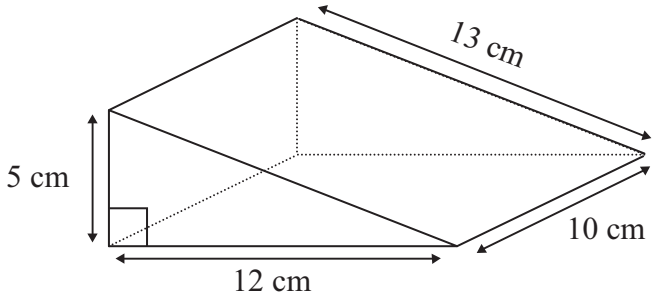


Diagram **NOT** accurately drawn

Work out the surface area of the triangular prism.

..... cm^2

(Total 3 marks)

Q4

5. The distance of the Earth from the Sun is 93 000 000 miles.

(a) Write the number 93 000 000 in standard form.

.....

(1)

One Angstrom unit is 3.94×10^{-6} inches.

(b) Write this as an ordinary number.

.....

(1)

(Total 2 marks)

Q5

Leave blank

6. (a) Factorise

(i) $6x^3 + 8x^2$

.....

(ii) $y^2 - 3y - 10$

.....

(4)

(b) (i) Factorise completely $p^2 - q^2$

.....

(ii) Hence or otherwise work out the value of $69^2 - 31^2$

.....

(3)

Q6

(Total 7 marks)

7. (a) Work out the value of $64^{\frac{2}{3}}$

.....

(2)

(b) Find the value of $\sqrt{\dfrac{(7+\sqrt{5})(7-\sqrt{5})}{11}}$

.....

(2)

Q7

(Total 4 marks)

TOTAL FOR SECTION B: 25 MARKS

END

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GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – NA/SSM (Unit 3) Higher

Questions	Working	Answer	Mark	Notes
A1 (a)	$\frac{1}{2} \times 4.5 \times 6$	13.5	**2**	M1 for $\frac{1}{2} \times 4.5 \times 6$ A1 cao
(b) (i)		4.45	**2**	B1 cao
(ii)		4.55		B1 cao
A2	2.5690 ÷ 8.1	0.317166	**2**	B1 for 2.569… as numerator, or 8.1 as denominator B1 to a min of 6 dp
A3 (a)		$12x - 3$	**1**	B1 cao
(b)		$y^2 + 2y$	**1**	B1 cao
(c)	$6z + 8 + 3z - 3$	$9z + 5$	**2**	M1 for $6z + 8 + 3z - 3$ A1 cao
(d)	$x^2 - 3xy + 2xy - 6y^2 = x^2 - xy - 6y^2$		**2**	M1 for four terms (ignoring signs) or for three correct terms. A1 cao
A4 (a) (i)		(6, 0, 12)	**2**	B1 cao
(ii)		(6, 4, 0)		B1 cao
(b)		(0, 2, 6)	**2**	B1 for D =(0, 4, 12) B1 cao
A5 (a)	Angle $OPT = 90^o$ Area A = $\frac{1}{2} \times (2x + 1) \times (x - 4)$ $= \frac{1}{2} \times (2x^2 - 7x - 4)$		**4**	B1 for Angle $OPT = 90^o$ M1 for A = $\frac{1}{2} \times (2x + 1) \times (x - 4)$ A1 for $(2x^2 - 7x - 4)$ seen A1 for conclusion
(b)		$PT > 9$	**1**	B1 for $PT > 9$oe
A6	254 × 0.766	194.564	**2**	M1 for 254 × 0.766 A1 cao
A7	Since the scales were only accurate to 0.1 kg then 1.4 should be the answer		**2**	B2 for demonstrating understanding that the answer is too accurate (B1 for partial understanding eg 1.400 or 1.40 etc)

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – NA/SSM (Unit 3) Higher

Questions	Working	Answer	Mark	Notes
B1	Angle $BQP = 62^\circ$ (Opposite) $x = 180 - (39 + 62)$	79°	**3**	M1 for Angle $BQP = 62^\circ$ (Opposite) B1 for $x = 180 - (39 + 62)$ (Angles in triangle = 180°) A1 cao
B2 (i)		20.88	**1**	B1 cao
(ii)		0.058	**1**	B1 cao
B3 (a)		Straight line of grad 2 thro –3	**3**	B3 for correct straight line from (–2, –7) to (3, 3) (B2 for 5 or 6 correct points plotted or correct straight line within the points (–2, –7) to (3, 3)) (B1 for 3 correct points plotted)
(b)		Line parallel thro +1	**1**	B1 ft if parallel and through $y = +1$
B4	$(\frac{1}{2} \times 5 \times 12) \times 2 + (13 \times 10) +$ $(12 \times 10) + (5 \times 10)$	360	**3**	M1 for one correct area M1 for $(\frac{1}{2} \times 5 \times 12) \times 2 + (13 \times 10) + (12 \times 10) +$ (5×10) A1 cao
B5 (a)		9.3×10^7	**1**	B1 cao
(b)		0.000 003 94	**1**	B1 cao
B6 (a) (i)		$2x^2(3x + 4)$	**4**	M1 for $2x^2$ A1 for $(3x + 4)$
(ii)		$(y - 5)(y + 2)$		B2 cao (B1 for $(y \pm 5)(y \pm 2)$)
(b) (i)		$(p - q)(p + q)$	**3**	B1 cao
(ii)	$(69 - 31)(69 + 31) = 38 \times 100$	3800		M1 for $(69 - 31)(69 + 31)$ A1 cao
B7 (a)		16	**2**	M1 for sight of cube root of 64 is 4 oe A1 for 16
(b)		2	**2**	M1 for numerator is 44 A1 for 2

Unit 4: Number, Algebra and Shape, Space and Measures 2
(Terminal Unit)

Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Unit 4 – Section A (Calculator)

Foundation Tier

Specimen Terminal Paper

Time: 1 hour

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 17 questions in this question paper. The total mark for this paper is 60.
There are 16 pages in this question paper. Any blank pages are indicated.
Calculators may be used.
If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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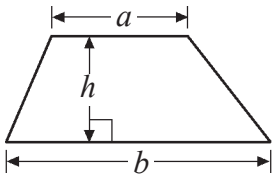
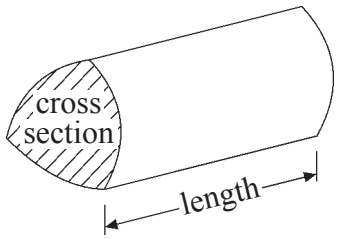
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



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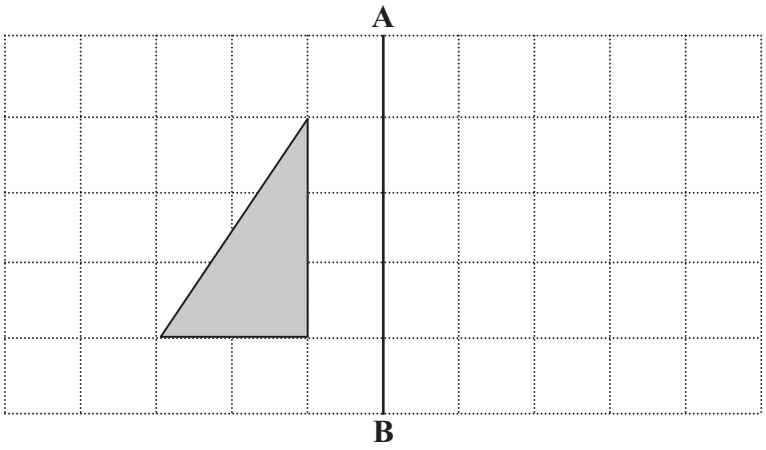
Answer ALL SEVENTEEN questions.

Write your answers in the spaces provided.

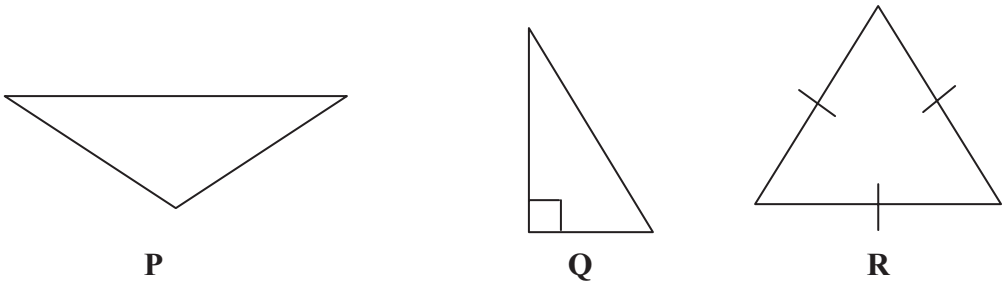
You must write down all stages in your working.

1.



(a) Reflect the shaded triangle in the line **AB**.

(1)



(b) (i) Draw a line of symmetry on triangle **P**.

(ii) Write down the mathematical name for triangle **Q**.

..... triangle

(iii) Write down the mathematical name for triangle **R**.

..... triangle

(3)

(Total 4 marks)

Q1

Leave blank

2. Here are two readings from a gas meter.

0	1	9	6	2

January

0	2	1	5	9

April

The difference in the meter readings gives the number of units of gas used.

(a) Work out the number of units of gas used.

.....

(2)

The cost of each unit of gas is 21p.

(b) Work out the cost of the gas used between January and April.
Give your answer in pounds (£).

£ .....

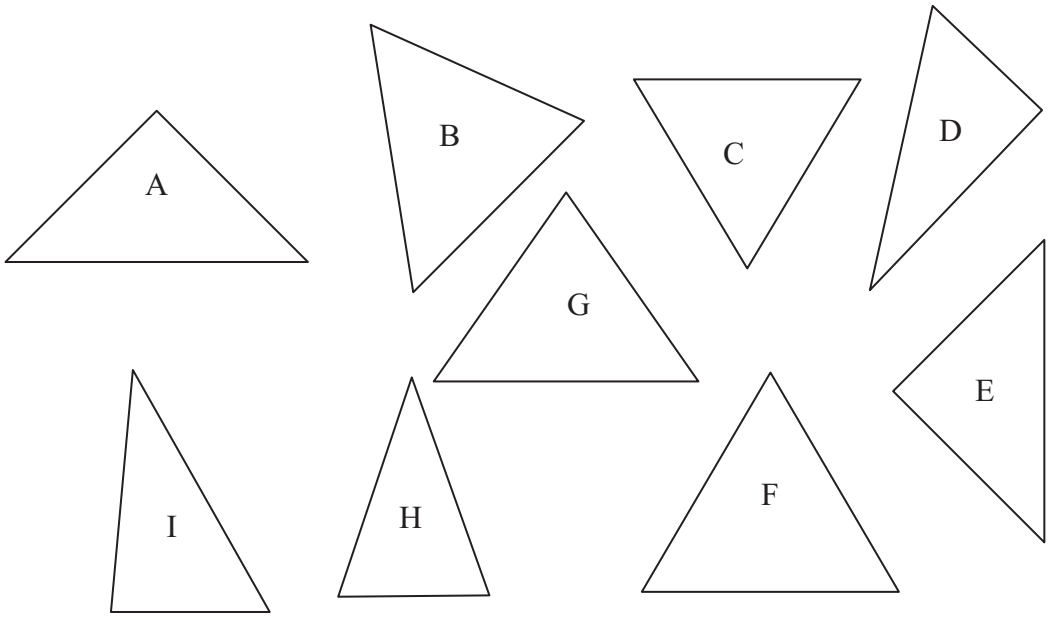
(2)

Q2

(Total 4 marks)

Leave blank

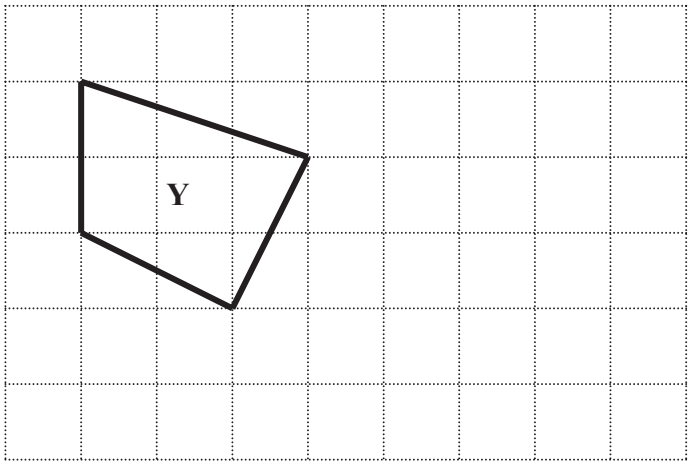
3. **Two** of these triangles are congruent.



(a) Write down the letters of the two triangles that are congruent.

....., ...

(1)



(b) On the grid draw a shape that is congruent to shape **Y**.

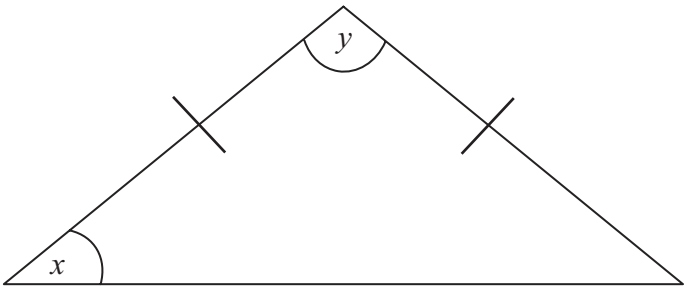
(1)

Q3

(Total 2 marks)

Leave blank

4. This triangle is accurately drawn.



(a) Write down the special name for this type of triangle.

.....

(1)

(b) What type of angle is angle x?

.....

(1)

(c) What type of angle is angle y?

.....

(1)

Q4

(Total 3 marks)

Leave blank

5. John used this formula to work out his overtime pay.

overtime pay = overtime rate × number of hours overtime worked

John's overtime rate was £7.20 per hour.
He worked 8 hours overtime.

(a) Work out his overtime pay.

£ .....

(2)

John used this formula to work out his total pay.

total pay = basic pay + overtime pay

John's basic pay was £234

(b) Work out his total pay.

£ .....

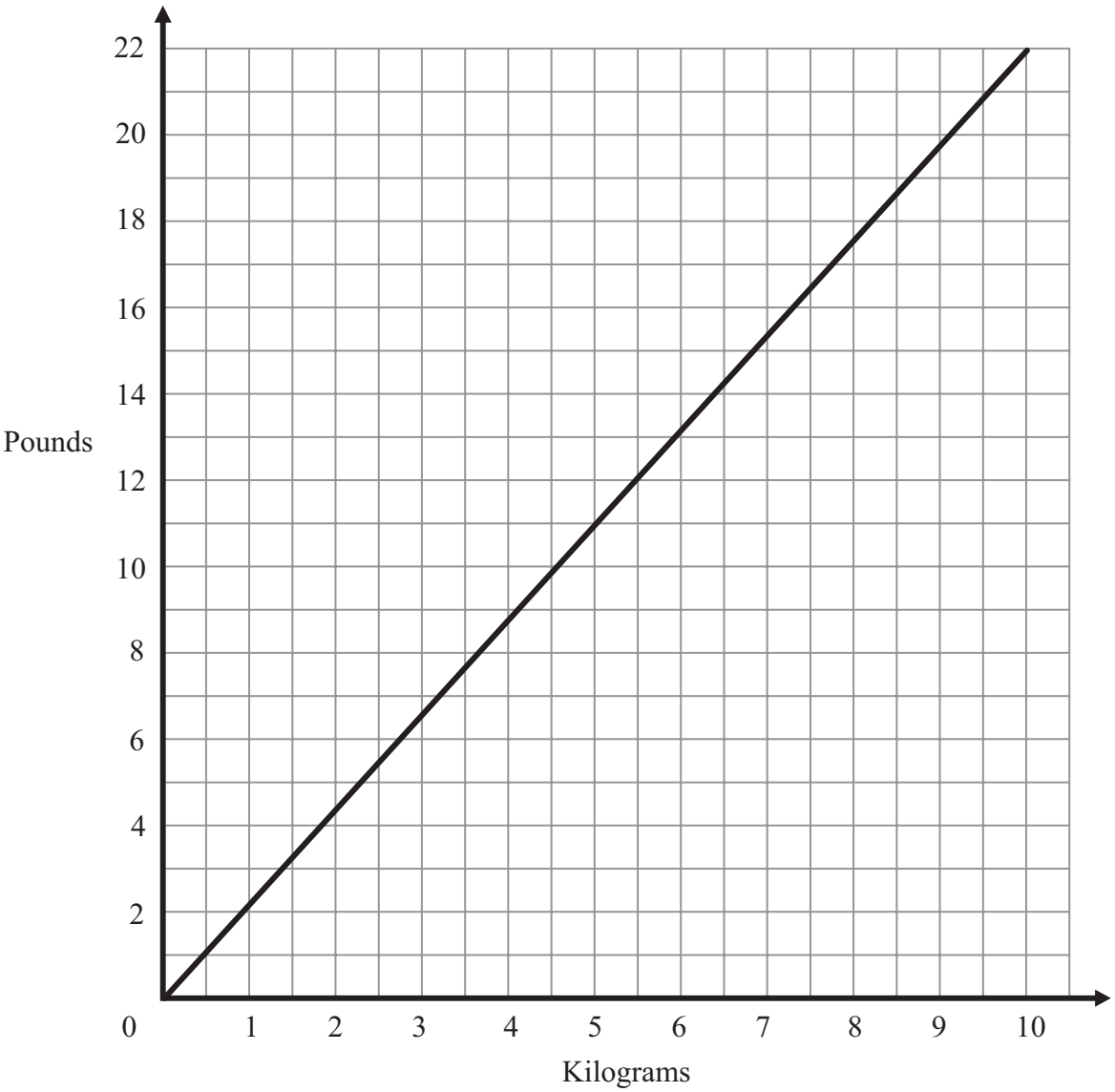
(1)

Q5

(Total 3 marks)

Leave blank

6. Here is a conversion graph for changing between kilograms and pounds.



(a) Use the graph to change 22 pounds to kilograms.

..... kg
(1)

(b) Use the graph to change 2.5 kilograms to pounds.

..... pounds
(1)

Fabio weighs 110 pounds.

(c) Change 110 pounds to kilograms.

..... kg
(2)

Q6

(Total 4 marks)

Leave blank

7. Write these numbers in order of size.
Start with the smallest number.

22% $\frac{1}{5}$ 0.3 $\frac{2}{7}$

.....

Q7

(Total 3 marks)

8. Simplify

(i) $2c + 3c + 4c$

.....

(ii) $f \times g \times 3$

.....

(iii) $x^2 + x^2 + x^2$

.....

Q8

(Total 3 marks)

Leave blank

9. (a) Use your calculator to work out

$5.2 + \sqrt{7.84}$

.....

(2)

(b) Make h the subject of the formula

$f = g + 3h$

(2) **Q9**

(Total 4 marks)

Leave blank

10.

The scale diagram shows a man and a dinosaur.

The man is 6 feet tall.

Estimate the height of the dinosaur:

(i) in feet,

..... feet

(ii) in metres.

..... metres

Q10

(Total 4 marks)

Leave blank

11.

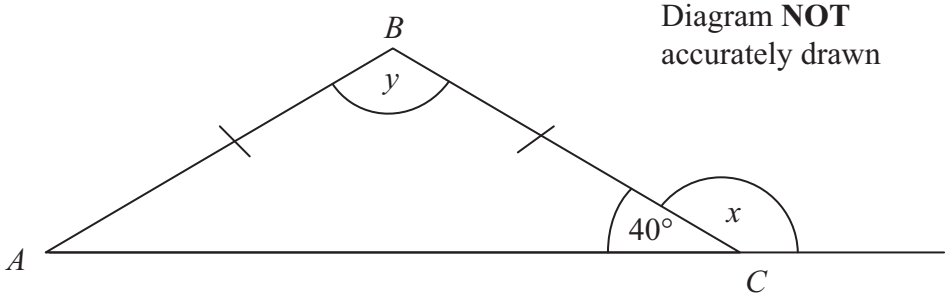


Diagram **NOT** accurately drawn

In triangle ABC,
$AB = BC$,
Angle $ACB = 40°$

(a) (i) Work out the size of angle x.

..... °

(ii) Give a reason for your answer.

.....

.....

(2)

(b) (i) Work out the size of angle y.

..... °

(ii) Give a reason for your answer.

.....

.....

(3) **Q11**

(Total 5 marks)

Leave blank

12. A group of students visited the USA.
A student bought a pair of sunglasses in the USA.
He paid $35.50

In England, an identical pair of sunglasses costs £26.99
The exchange rate was £1 = $1.42

(a) In which country were the sunglasses cheaper?

.....

(2)

(b) How much cheaper?

.....

(2) **Q12**

(Total 4 marks)

13. Here is a list of ingredients for making some Greek food for **6** people.

2 cloves of garlic
4 ounces of chick peas
4 tablespoons of olive oil
5 fluid ounces of Tahina paste

Work out the amount of ingredients to make the Greek food for **9** people.

..... cloves of garlic

..... ounces of chick peas

..... tablespoons of olive oil

..... fluid ounces of Tahina paste **Q13**

(Total 2 marks)

Leave blank

14.

Tigers Club

Admission:
£2.40
Special offer
20% off

Cheetahs Club

Admission:
£2.70
Special offer
$\frac{1}{3}$ off

It normally costs £ 2.40 to get into the Tigers Club but there is 20% off the price.

It normally costs £ 2.70 to get into the Cheetahs Club but there is $\frac{1}{3}$ off the price.

Which club is cheaper?
You **must** show all your working with your answer.

.....

Q14

(Total 4 marks)

Leave blank

15. The heat setting number of a gas oven is called its Gas Mark.
This rule may be used to change a Gas Mark to a temperature in °C.

Gas Mark → × 14 → + 121 → Temperature in °C

(a) Use the rule to change Gas Mark 7 to a temperature in °C.

.....°C
(2)

(b) Complete the formula for T, the temperature in °C, in terms of G, the Gas Mark.

T = ...
(2) **Q15**

(Total 4 marks)

16. Solve $4(y + 3) = 6$

..... **Q16**

(Total 3 marks)

Leave blank

17. The equation

$$x^3 + x = 37$$

has a solution between 3 and 4
Use a trial and improvement method to find this solution.
Give your answer correct to one decimal place.
You must show **ALL** your working.

$x =$ .....

Q17

(Total 4 marks)

TOTAL FOR SECTION A: 60 MARKS

END

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Terminal (Unit 4) Foundation Section A

Questions	Working	Answer	Mark	Notes
1 (a) (i)		reflection	**1**	B1
(b) (ii)		line	**1**	B1
(iii		right-angled	**1**	B1 for right-angled or scalene
		equilateral	**1**	B1
2 (a)	2159 – 1962	197	**2**	M1 for 2159 – 1962 A1 cao
(b)	197 × 21p	41.37	**2**	M1 for "197" × 21 or 0.21 or digits 4137 A1 cao
3 (a)		A, E	**1**	B1 for both, no extras
(b)		shape	**1**	B1
4 (a)		isosceles	**1**	B1
(b)		acute	**1**	B1
(c)		obtuse	**1**	B1
5 (a)	7.20 × 8	57.60	**2**	M1 for 7.20 × 8 or digits 576(000) seen A1 cao
(b)	57.60 + 234	291.60	**1**	B1 f.t. for "a" + 234
6 (a)		10	**1**	B1
(b)		5.5 ± 0.2	**1**	B1
c	10 × 5	50	**2**	M1 for "10" × 5 or any other valid method A1 cao
7		$\frac{1}{5}$, 22%, $\frac{2}{7}$, 0.3	**3**	M1 for converting $\frac{1}{5}$ or $\frac{2}{7}$ to a decimal or % A2 cao (M1A1 for one in the incorrect position)

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Terminal (Unit 4) Foundation Section A

Questions	Working	Answer	Mark	Notes
8 **(i)**		$9c$	**3**	B1
(ii)		$3fg$		B1
(iii)		$3x^2$		B1
9 **(a)**	$5.2 + 2.8$	6	**2**	B1 for 2.8 seen A1 cao
(b)	$f = g + 3h$ $f - g = 3h$ $\frac{f-g}{3} = h$	$\frac{f-g}{3} = h$	**2**	B1 for $f - g = 3h$ A1 cao
10 **(i)**	Dinosaur 3 - 3.5 taller than the man	19-21	**4**	M1 3-3.5 times taller
(ii)	"3.3" × 6 = "20" × 0.3	6.0-7.0		M1 "3.3" × 6 A1 20 (accept 19-21) B1 ft "20" × 0.3 = 6 (accept 6. – 7.0) Or "20" ÷ 3.3 = 6.6
11 **(a)**	$180 - 40 =$	140	**2**	B1 cao B1 reason (straight line)
(b)	$180 - 2 \times 40$	100	**3**	M1 2×40 A1 cao B1 reason (isosceles)

Questions	Working	Answer	Mark	Notes
12 (a)	\$35.50 ÷ 1.42 = £25; £26.99 – £25 = £1.99 Cheaper in the USA Or £26.99 × 1.42 = \$38.33; \$38.33 – 35.50= \$2.83 Cheaper in the USA	USA	**2**	M1 \$35.50 ÷ 1.42 A1 £25 OR: M1 £26.99 × 1.42 A1 \$38.33
(b)	£1.99 or \$2.83	£1.99 or \$2.83	**2**	B1 conclusion B1 difference found
13		3, 6, 6, 7.5	**2**	B2 all four correct (B1 for two correct)
14	£2.40 × 0.8 = £1.92 £2.70 × $\frac{2}{3}$ = £1.80	Cheetah at £1.80	**4**	M1 for 2.40 × 0.8 (oe) A1 for £1.92 M1 for £2.70 × $\frac{2}{3}$ or £1.80 seen A1 for £1.80 **and** Cheetah as cheapest
15 (a)	7 × 14 + 121 = 219	219	**2**	M1 7× 14 + 121 A1 cao
(b)		14*G* + 121	**2**	B2 cao (B1 for 14*G*)

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Terminal (Unit 4) Foundation Section A

Questions	Working	Answer	Mark	Notes
16	$4(y + 3) = 6$ $4y + 12 = 6$ $4y = -6$ $y = -1.5$	-1.5	**3**	B1 for $4y + 12$ or $y + 3 = 6 \div 4$ M1 for isolating $4y$ A1 oe
17		3.2	**4**	B2 for a trial between 3.1 and 3.5 incl (B1 for a trial between 3 and 4 incl) B1 for a trial between 3.2 and 3.3 excl B1 for 3.2 (dep on at least B1)

Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Unit 4 – Section B – (Non-Calculator)

Foundation Tier

Specimen Terminal Paper

Time: 1 hour

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 18 questions in this question paper. The total mark for this section is 60.
There are 16 pages in this question paper. Any blank pages are indicated.
Calculators must not be used.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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Turn over

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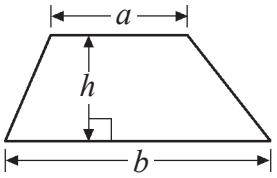
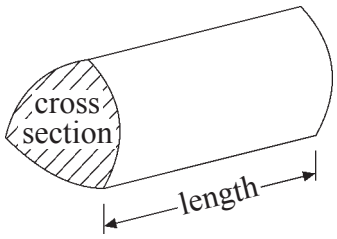
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



Leave blank

Answer ALL EIGHTEEN questions.
Write your answers in the spaces provided.
You must NOT use a calculator.
You must write down all stages in your working.

1. (a) Write as a percentage

$\frac{1}{4}$

..... %
(1)

(b) Write as a fraction

63%

.....
(1)

(c) Write 7% as a decimal.

.....
(1)

(Total 3 marks)

Q1

2. Sally wrote down the temperature at different times on 1st January 2003.

Time	Temperature
midnight	– 6 °C
4 am	– 10 °C
8 am	– 4 °C
noon	7 °C
3 pm	6 °C
7 pm	– 2 °C

(a) Write down

(i) the **highest** temperature,

.....°C

(ii) the **lowest** temperature.

.....°C
(2)

(b) Work out the difference in the temperature between

4 am and 8 am.

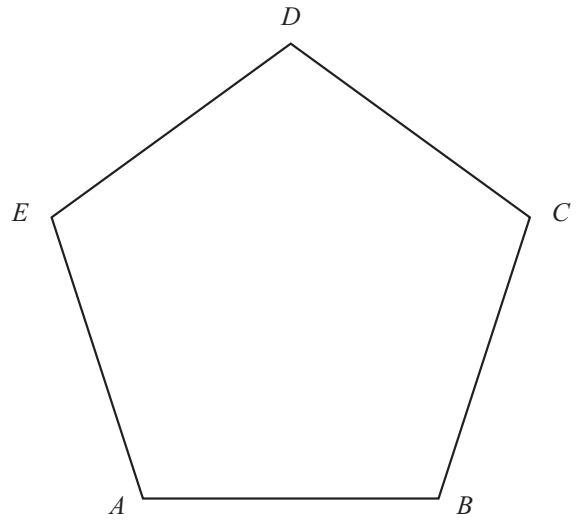
.....°C
(1)

(Total 3 marks)

Q2

Leave blank

3.



(a) (i) Measure the length of *AB*.

..... cm

(ii) Measure the size of angle *A*.

..... °

(2)

(b) In the space below, draw a line that is 12 cm long.

(1)

(c) Mark with a cross (×) the midpoint of the line that you have drawn.

(1)

Q3

(Total 4 marks)

4. (a) Work out 50% of £640

£ ..... .

(2)

(b) Work out 10% of £56

£ ..... .

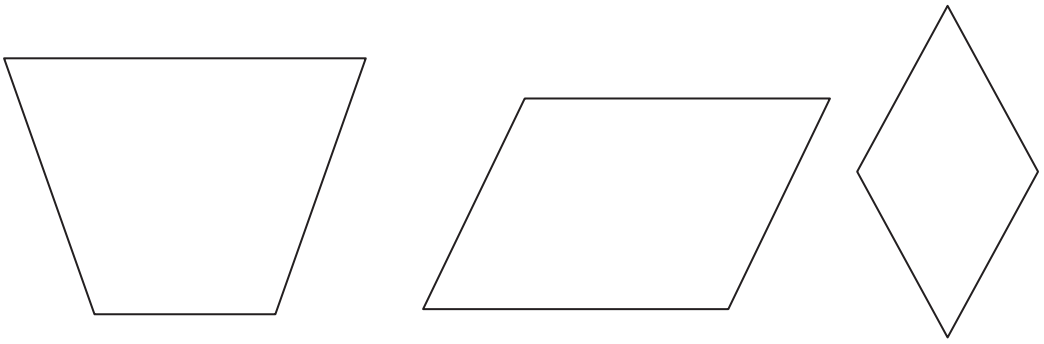
(2)

Q4

(Total 4 marks)

Leave blank

5. Here are three shapes.



A **B** **C**

One of these shapes has **no** lines of symmetry.

(a) Write down the letter of this shape.

.....

(1)

One of these shapes does **not** have rotational symmetry.

(b) Write down the letter of this shape.

.....

(1)

Q5

(Total 2 marks)

6. (a) Work out $\frac{1}{3}$ of 21

.....

(1)

(b) Work out $\frac{3}{5}$ of 35

.....

(2)

Q6

(Total 3 marks)

Leave blank

7. The chart shows the shortest distances, in kilometres, between pairs of cities.
For example, the shortest distance between London and Manchester is 290 km.

London				
196	**Nottingham**			
290	101	**Manchester**		
325	158	56	**Liverpool**	
639	446	346	348	**Glasgow**

(a) Write down the shortest distance between **Nottingham** and **Liverpool**.

..... km
(1)

Daniel drives from London to Manchester by the shortest route.
He drives 137 km and stops for a rest.

(b) Work out how many more kilometres he must drive.

..... km
(2)

(c) Write down the names of the two cities which are the **least** distance apart.

..... and .....
(1)

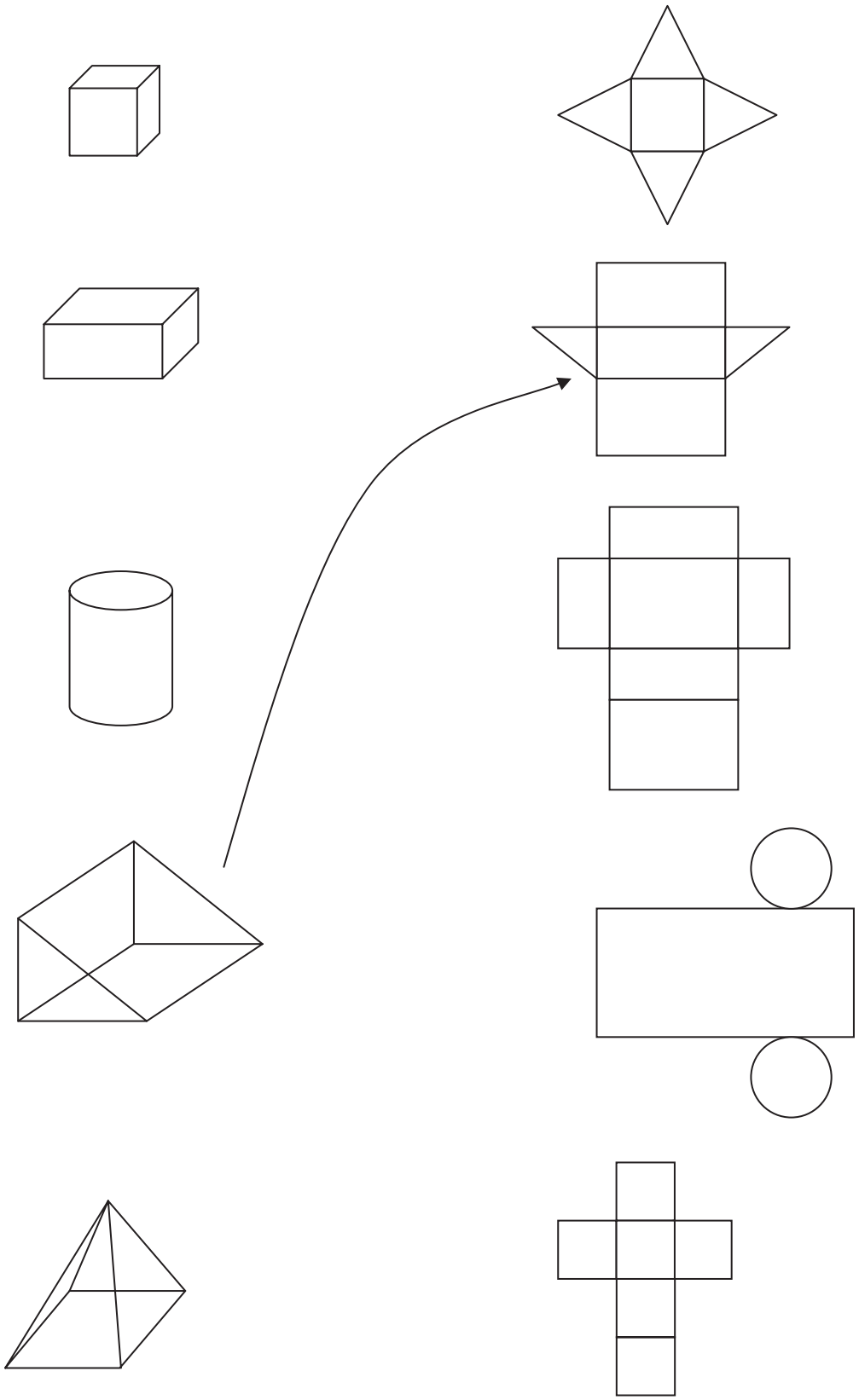
(Total 4 marks)

Q7

Leave blank

8. The diagram shows some solid shapes and their nets.
An arrow has been drawn from one solid shape to its net.

Draw an arrow from each of the other solid shapes to its net.



Q8

(Total 3 marks)

Leave blank

9. (a) Work out $\frac{2}{5} + \frac{1}{10}$

.....

(2)

(b) Work out $\frac{2}{3} \times \frac{1}{4}$

Write your answer as a fraction in its simplest form.

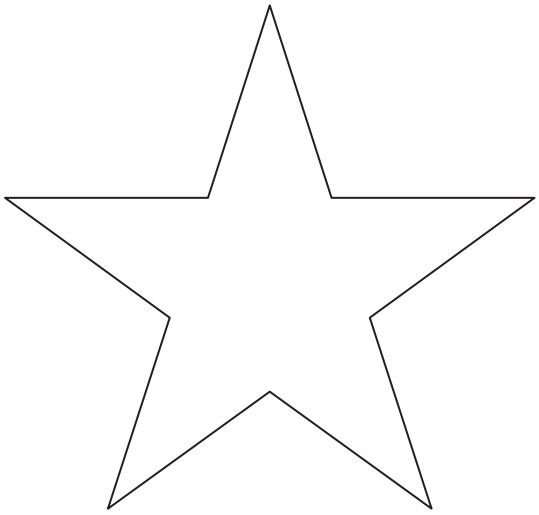
.....

(2)

(Total 4 marks)

Q9

10. (a) Write down the order of rotational symmetry of this star.



order .....

(1)

(b) On the star draw in all the lines of symmetry.

(1)

(Total 2 marks)

Q10

Leave blank

11. Simplify $3f + 2g - f + 5g$

.....

(Total 2 marks)

Q11

12. This diagram shows a sketch of a triangle.

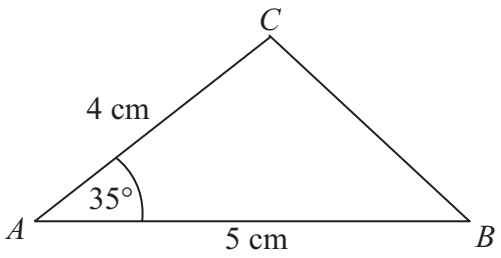


Diagram **NOT** accurately drawn

$AC = 4$ cm
$AB = 5$ cm
Angle $A = 35°$

Complete the accurate drawing of triangle ABC.
The line AB has been accurately drawn below to help you.

A B

(Total 2 marks)

Q12

Leave blank

13. Solve these equations

(a) $x + 5 = 2$

$x =$ .....
(1)

(b) $5p - 3 = 4$

$p =$ .....
(2)

(c) $2q - 4 = 5q + 5$

$q =$ .....
(2)

(d) $5(2r + 7) = 70$

$r =$ .....
(2)

Q13

(Total 7 marks)

14. Rashmi pays his motorbike repair bill.

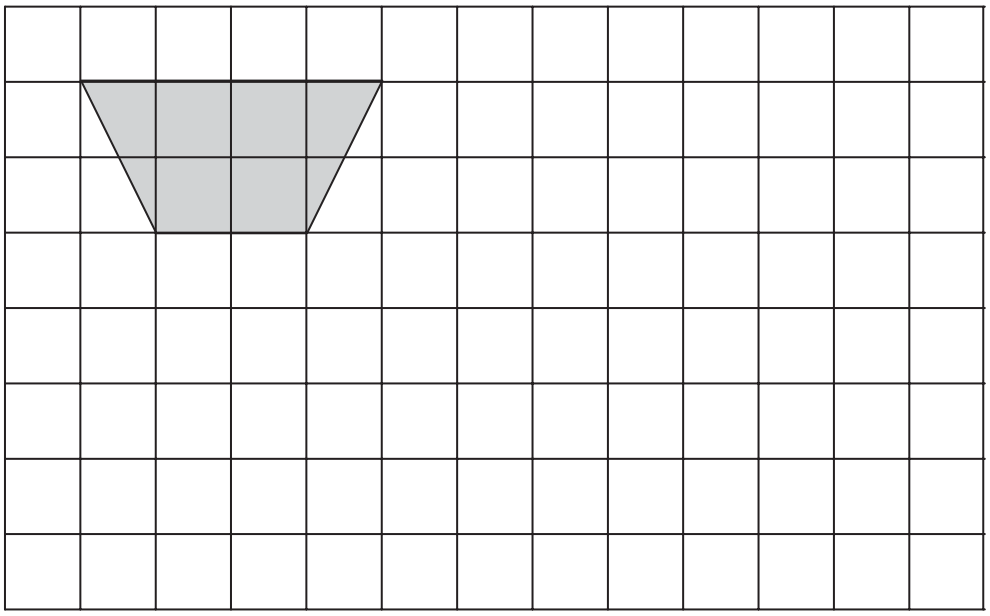
His bill was £80
Then the VAT was added.
Work out how much VAT was added to Rashmi's bill.

£ .....
(Total 2 marks)

Q14

Leave blank

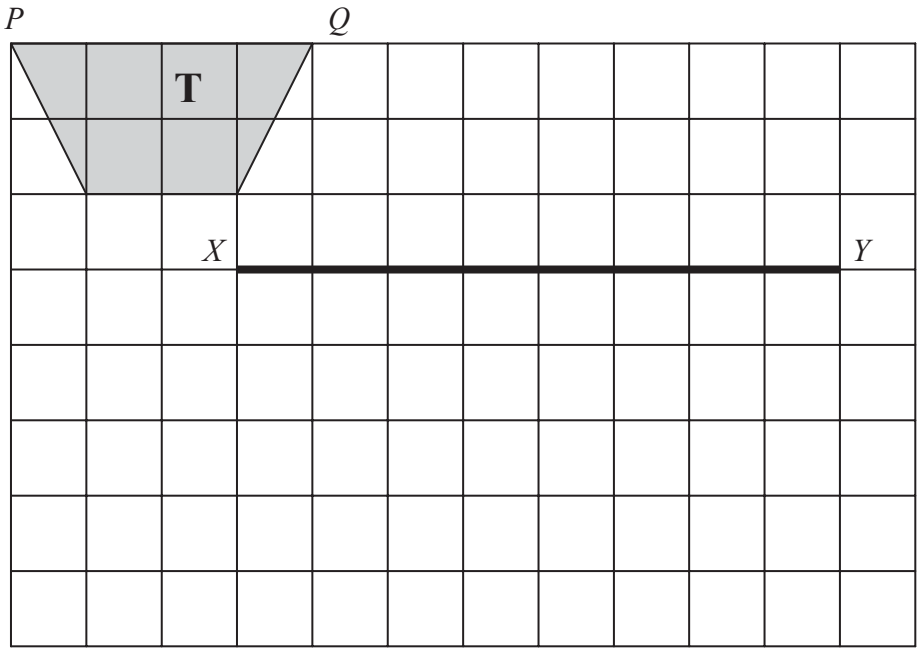
15. The diagram shows a trapezium on a grid.



(a) Show how the trapezium tessellates.

You should draw at least 6 shapes on the grid.

(2)



The trapezium **T** is enlarged.

The line PQ becomes the line XY.

(b) On the grid, complete the enlargement of trapezium **T**.

(2)

Q15

(Total 4 marks)

Leave blank

16.

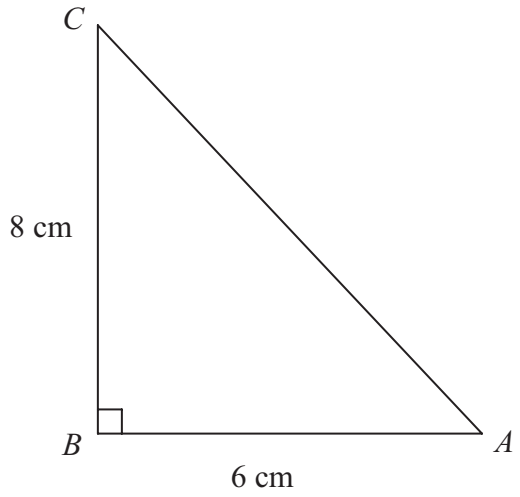


Diagram **NOT** accurately drawn

(a) Calculate the area of the triangle.

..... cm^2

(2)

(b) Calculate the length of AC.

..... cm

(3)

Q16

(Total 5 marks)

Leave blank

17. Rosa makes pizzas.

She uses cheese, topping and dough in the ratios 2 : 3 : 5
Rosa uses 70 grams of dough.

Work out the number of grams of cheese and the number of grams of topping Rosa uses.

Cheese ..... g

Topping ..... g

Q17

(Total 3 marks)

18. Write as a power of 7

(i) $7^5 \times 7^3$

.....

(ii) $7^{10} \div 7^4$

.....

(iii) $\dfrac{7^5 \times 7^3}{7^{10} \div 7^4}$

.....

Q18

(Total 3 marks)

TOTAL FOR SECTION B: 60 MARKS

END

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GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Terminal (Unit 4) Foundation Section B

Questions	Working	Answer	Mark	Notes
1 (a)		25	**1**	B1
(b)		$\frac{63}{100}$	**1**	B1
(c)		0.07	**1**	B1
2 (a) (i)		7	**2**	B1 for 7
(ii)		−10		B1 for −10
(b)		6	**1**	B1 for 6 (accept −6)
3 (a) (i)		4 cm ± 0.2	**1**	B1
(ii)		108° ± 2	**1**	B1
(b)		line of 12 cm	**1**	B1 for line of 12 cm ± 2 mm
(c)		midpoint	**1**	B1 ft for midpoint drawn ± 2 mm
4 (a)	50 ÷ 100 × 640	320	**2**	M1 for 50 ÷ 100 × 640 A1 cao
(b)	10 ÷ 100 × 56	5.60	**2**	M1 for 10 ÷ 100 × 56 A1 cao
5 (a)		B	**1**	B1
(b)		A	**1**	B1
6 (a)		7	**1**	B1
(b)	3 ÷ 5 × 35	21	**2**	M1 for 3 ÷ 5 × 35 A1 cao
7 (a)		158	**1**	B1
(b)	300 – 137	153	**2**	M1 for 290 – 137 A1 ft
(c)		cities	**2**	B1 for Manchester & Liverpool
8		1 to 5 2 to 3 3 to 4 5 to 1	**3**	B3 for all four matchings correct (B2 for 2 correct) (B1 for one correct)

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Terminal (Unit 4) Foundation Section B

Questions	Working	Answer	Mark	Notes
9 (a)	$\frac{4}{10} + \frac{1}{10}$	$\frac{5}{10}$	**2**	M1 for $\frac{4}{10} + \frac{1}{10}$ A1 for $\frac{1}{2}$ oe
(b)	$\frac{2}{12}$	$\frac{1}{6}$	**2**	M1 for $\frac{2}{12}$ oe A1 cao
10 (a)		5	**1**	B1
(b)		5 lines	**1**	B1
11		$2f + 7g$	**2**	B2 (B1 for $2f$ or $7g$ seen)
12		construction	**2**	B2 for triangle within overlay (B1 for 4cm ± 2 mm or 35° ± 2°)
13 (a)		-3	**1**	B1
(b)	$5p = 4 + 3 = 7$	1.4	**2**	M1 for 7 seen A1 cao
(c)	$2q - 5q = 5 + 4$ $-3q = 9$	-3	**2**	M1 for $2q - 5q = 5 + 4$ oe A1 cao
(d)	$10r + 35 = 70$, $10r = 35$	3.5	**2**	M1 for $10r + 35$ or $70 \div 5$ or 14 seen A1 cao
14	$80 + \frac{17.5}{100} \times 80 = 80 + 14$	94	**2**	M1 for $\frac{17.5}{100} \times 80$ or 14 seen A1 for £94 or £94.00
15 (a)		tessellation	**2**	B2 for at least 6 shapes drawn correctly (B1 for at least 4 shapes drawn correctly)
(b)		enlargement	**2**	B2 for correct enlargement (B1 for one line correctly enlarged)

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Terminal (Unit 4) Foundation Section B

Questions	Working	Answer	Mark	Notes
16 (a)	$(8 \times 6) \div 2$	24	**2**	M1 for $(8 \times 6) \div 2$ A1 cao
(b)	$\sqrt{8^2 + 6^2} = \sqrt{100}$	10	**3**	M1 for $8^2 + 6^2$ or 64 + 36 or 100 seen M1 for $\sqrt{"8^2 + 6^2"}$ A1 cao
17	$70 \div 5 \times 2$ $70 \div 5 \times 3$	28, 42	**3**	B3 for both correct B2 for one correct B1 for $70 \div 5$ seen
18 (i)		7^8	**2**	B1 cao
(ii)		7^6		B1cao
(iii)		7^2	**1**	B1 ft from their (i) and (ii)

Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Unit 4 – Section A (Calculator)

Higher Tier

Specimen Terminal Paper

Time: 1 hour 10 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator.
Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 17 questions in this question paper. The total mark for this paper is 60.
There are 16 pages in this question paper. Any blank pages are indicated.
Calculators may be used.
If your calculator does not have a π button, then take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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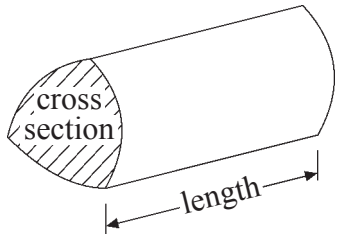
Formulae: Higher Tier

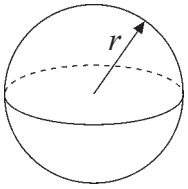
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



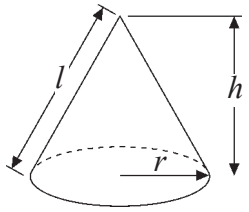
Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$

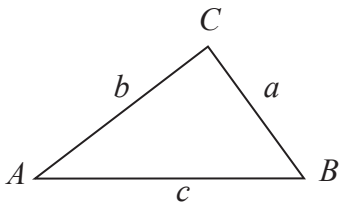


Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$



In any triangle ABC



Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle $= \frac{1}{2}ab\sin C$

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

Leave blank

Answer ALL SEVENTEEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. Here is a list of ingredients for making some Greek food for **6** people.

2 cloves of garlic
4 ounces of chick peas
4 tablespoons of olive oil
5 fluid ounces of Tahina paste

Work out the amount of ingredients to make the Greek food for **9** people.

..... cloves of garlic

..... ounces of chick peas

..... tablespoons of olive oil

..... fluid ounces of Tahina paste

Q1

(Total 2 marks)

2. A regular polygon has an exterior angle of 20°

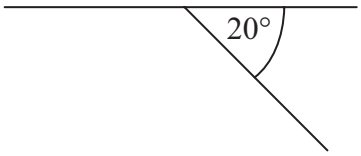


Diagram **NOT** accurately drawn

How many sides has this regular polygon?

.....

Q2

(Total 2 marks)

Leave blank

3. The heat setting number of a gas oven is called its Gas Mark.
This rule may be used to change a Gas Mark to a temperature in °C.

Gas Mark → × 14 → + 121 → Temperature in °C

Complete the formula for T, the temperature in °C, in terms of G, the Gas Mark.

$T =$ .....

Q3

(Total 2 marks)

4.

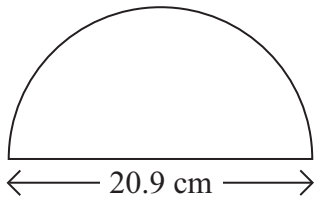


Diagram **NOT** accurately drawn

A semicircle has a diameter of 20.9 cm.

Work out the perimeter of the semicircle.
Give your answer to an appropriate degree of accuracy.

..... cm

Q4

(Total 4 marks)

Leave blank

5.

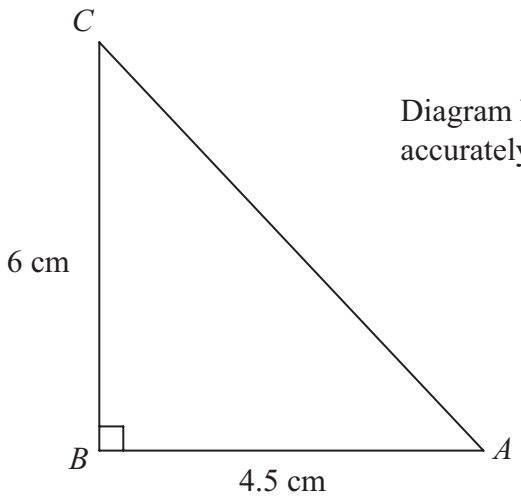


Diagram **NOT** accurately drawn

(a) Calculate the length of AC.

..... cm

(2)

(b) ABC is the side of a triangular prism of length 10cm.

Calculate the volume of the triangular prism.

..... cm

(3)

Q5

(Total 5 marks)

6. Simplify $3x^3y^2 \times x^2y^3$

.....

Q6

(Total 2 marks)

Leave blank

7. The equation

$$x^3 + x = 37$$

has a solution between 3 and 4
Use a trial and improvement method to find this solution.
Give your answer correct to one decimal place.
You must show **ALL** your working.

$x =$ .....

Q7

(Total 4 marks)

8. The table shows some expressions.
a, b, c and *d* represent lengths.
π and 3 are numbers which have no dimensions.

$3a^2$	$\frac{\pi ab^3}{3d}$	πbc	$ac + bd$	$\pi(a + b)$	$3(c + d)^3$	$3\pi bc^2$

Tick (✓) the boxes underneath the **three** expressions which could represent volumes.

Q8

(Total 3 marks)

Leave blank

9. A company gives a discount of $7\frac{1}{2}$ % off invoices that are paid within 3 weeks.
An invoice for £84 was paid within 3 weeks.

(a) How much was paid?

£ .....
(3)

The company bought a van that had a value of £12 000
Each year the value of the van depreciates by 25%

(b) Work out the value of the van at the end of three years.

£ .....
(3)

The company bought a new truck.
Each year the value of the truck depreciates by 20%
The value of the new truck can be multiplied by a number to find its value at the end of four years.

(c) Find this number as a decimal.

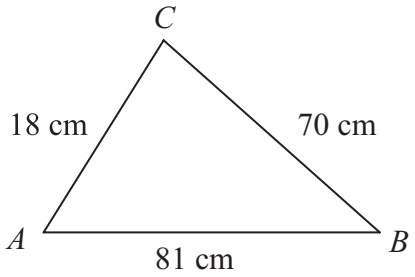
.....
(2)

Q9

(Total 8 marks)

Leave blank

10. Triangle *ABC* is similar to triangle *DEF*.
Angle *BAC* = angle *EDF*.



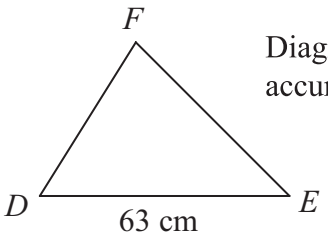


Diagram **NOT** accurately drawn

In triangle *ABC*, *AB* = 81 cm, *BC* = 70 cm, *AC* = 18 cm.
In triangle *DEF*, *DE* = 63 cm.

(a) Calculate the length of *DF*.

..... cm
(2)

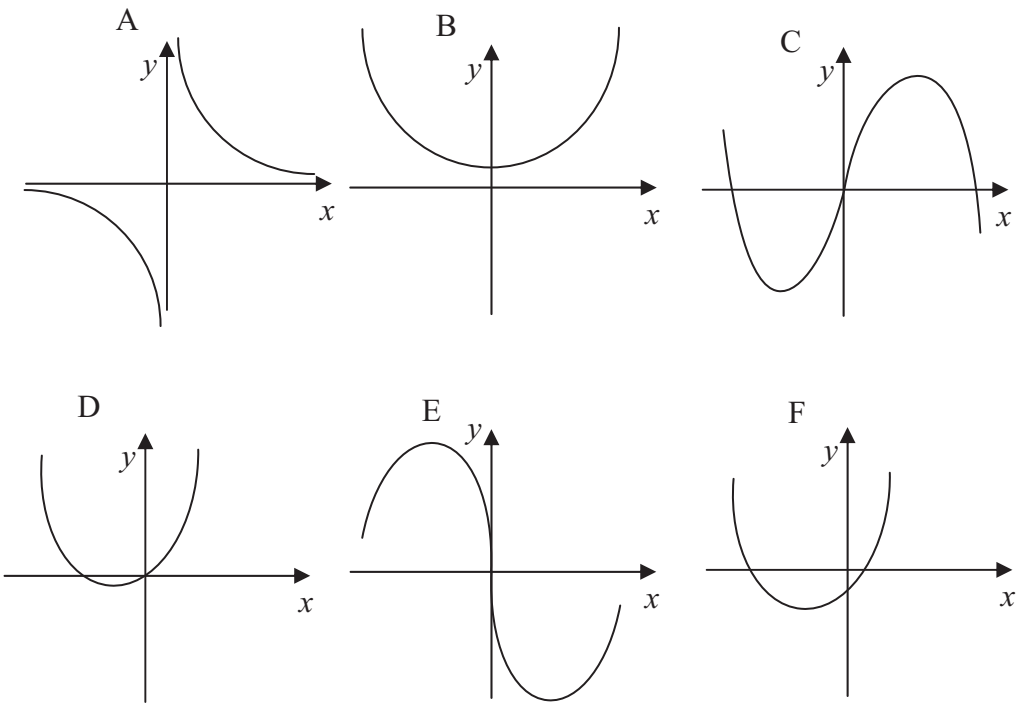
(b) Calculate the size of angle *BAC*.
Give your answer correct to 1 decimal place.

.....°
(3) **Q10**

(Total 5 marks)

Leave blank

11.



Each of the equations in the table represents one of the graphs *A* to *F*.

Write the letter of each graph in the correct place in the table.

Equation	**Graph**
$y = x^2 + 3x$	
$y = x - x^3$	
$y = x^3 - 2x$	
$y = x^2 + 2x - 4$	
$y = \frac{4}{x}$	
$y = x^2 + 3$	

Q11

(Total 3 marks)

Leave blank

12. Solve the inequality $5x + 7 \leqslant 3x + 14$

.....

(Total 2 marks)

Q12

13. Use your calculator to work out

$$\frac{27.2 - 8.35}{\sqrt{9.7 + 3.26}}$$

Write down all the figures on your calculator display.

.....

(Total 2 marks)

Q13

Leave blank

14. The number 1998 can be written as $2 \times 3^n \times p$, where n is a whole number and p is a prime number.

(a) Work out the value of n and the value of p.

$n =$ .....

$p =$ .....

(2)

(b) Using your answers to part (a), or otherwise, find the factor of 1998 which is between 100 and 200

.....

(1)

Q14

(Total 3 marks)

15. Evaluate $\left(2+\sqrt{5}\right)^2$, writing your answer in the form $a+b\sqrt{5}$

.....

Q15

(Total 2 marks)

Leave blank

16. Fred cycled from home to his friend's house and back again.
The distance from Fred's home to his friend's house is 20 km.
On his way from home to his friend's house, Fred cycled at x km per hour.
On his way back, Fred's speed had decreased by 2 km per hour.
It took Fred 4 hours altogether to cycle to his friend's house and back.

(a) Write down an equation for x.

.....

(2)

(b) Show that the equation can be written as

$$x^2 - 12x + 10 = 0$$

(2)

(c) Solve the equation in part (b).
Give your answers correct to 1 decimal place.

.....

(3)

Only one of the answers in part (c) can be Fred's speed.

(d) Explain why.

.....

.....

(1)

Q16

(Total 8 marks)

Leave blank

17. Two similar tins have heights 12 cm and 20 cm.
The volume of the smaller tin is 162 cm^3.

Calculate the volume, in cm^3, of the larger tin.

..... cm^3 **Q17**

(Total 3 marks)

TOTAL FOR SECTION A: 60 MARKS

END

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GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Terminal (Unit 4) Higher Section A

Questions	Working	Answer	Mark	Notes
1		3, 6, 6, 7.5	**2**	B2 all four correct (B1 for two correct)
2	360° ÷ 20° =	18	**2**	M1 360 ÷ 20 A1 cao
3		$14G + 121$	**2**	B2 cao (B1 for $14G$)
4	3.142 × 20.9 = 65.6678 (65.6-65.7) 65.6678 ÷ 2 = 32.8339 (32.8 - 32.9) 32.8339 + 20.9 =	53.7	**4**	M1 for 3.142 × 20.9 or $\pi \times 20.9$ or 3.142 × 20.9/2 or π × 20.7/2 or 65.7 seen A1 for 32.8-32.9 seen for arc length B1 ft (indep) for "32.8" + 20.9 or 53.7-53.8 A1 for rounding to 53.7 NB: allow use of 3.14, 22/7 instead of 3.142
5 (a) **(b)**	$6^2 + 4.5^2 = 56.25$ $\sqrt{56.25} = 7.5$ 6 × 4.5 ÷ 2 = 13.5 13.5 × 10	7.5 135	**2** **3**	M1 for $6^2 + 4.5^2$ A1 cao M1 for 6 × 4.5 ÷ 2 M1 (dep) for 13.5 A1 cao
6		$3x^5y^5$	**2**	B2 cao (B1 for $3x^?y^5$ or $3x^5y^?$ where ? is not 5)
7		3.2	**4**	B2 for a trial between 3.1 and 3.5 incl (B1 for a trial between 3 and 4 incl) B1 for a trial between 3.2 and 3.3 excl B1 for 3.2 (dep on at least B1)
8		2^{nd} , 6^{th} , 7^{th}	**3**	B3 (B1 for each, –1 each extra)

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Terminal (Unit 4) Higher Section A

Questions	Working	Answer	Mark	Notes
9 (a)	$84 \times 92.5 =$	£77.70	**3**	M2 84×92.5 (M1 for $84 - (84 \times 7.5/100)$ A1 cao
(b)	$12\,000 \times 0.75 = 9000$ $9000 \times 0.75 = 6750$ $6750 \times 0.75 = 5062.5$	£5062.50	**3**	M1 for $12\,000 \times 0.75$ or sight of 9000 M1 for continued use of 0.75 (at least one further step) A1 cao
(c)	$0.8 \times 0.8 \times 0.8 \times 0.8$	0.4096	**2**	M1 $0.8 \times 0.8 \times 0.8 \times 0.8$ or 0.8^4 A1 cao
10 (a)	$18 \times (63/81) =$	14	**2**	M1 63/81 or 81/63 or 1.2857.. or 0.7777.. A1 cao
(b)	Cosine Rule: $70^2 = 18^2 + 81^2 - 2 \times 18 \times 81 \times \cos A$	47.1°	**3**	M1 $70^2 = 18^2 + 81^2 - 2 \times 18 \times 81 \times \cos A$ M1 either $\cos A = \frac{18^2 + 81^2 - 70^2}{2 \times 18 \times 81}$ or $70^2 = 6885 - 2916 \cos A$ A1 cao
11	D, C, E, F, A, B	DCEFAB	**3**	B3 cao (B2 for 4 correct B1 for 2 correct)
12	$5x - 3x \leq 14 - 7$ $2x \leq 7$	$x \leq 3.5$	**2**	M1 for $5x - 3x \leq 14 - 7$ o.e. A1 for $x \leq 3.5$ o.e.
13	$18.85 \div 3.6$	5.23611111	**2**	B1 for 18.85 as numerator or 3.6 as denominator B1 5.23611 or better
14		$n = 3$ $p = 37$ 111	**2** **1**	B1 for n cao B1 for p cao B1 cao
15	$(2 + \sqrt{5})(2 + \sqrt{5}) = 4 + 2\sqrt{5} + 2\sqrt{5} + 5$	$9 + 4\sqrt{5}$	**2**	M1 for $4 + 2\sqrt{5} + 2\sqrt{5} + 5$ or better A1 cao (accept $a = 9$, $b = 4$)

Questions	Working	Answer	Mark	Notes
16 (a)	Total time = $\frac{D_1}{V_1} + \frac{D_2}{V_2} = \frac{20}{x} + \frac{20}{x-2}$ So $\frac{20}{x} + \frac{20}{x-2} = 4$		**2**	M1 any two of $\frac{20}{x}$, $\frac{20}{x-2}$, =4 A1 cao
(b)	$20(x-2) + 20x = 4x(x-2)$ $20x - 40 + 20x = 4x^2 - 8x$ $4x^2 - 48x + 40 = 0$ $x^2 - 12x + 10 = 0$		**2**	M1 Correct removal of denominators A1 Convincing algebra throughout .
(c)	$\frac{-(-12) \pm \sqrt{(12^2 - 4.1.10)}}{2}$ $\frac{12 \pm \sqrt{104}}{2}$ $x = 11.099$ or 0.90098	11.1, 0.9	**3**	M1 correct substitution A2 11.1 and 0.9 (A1 one answer)
(d)			**1**	B1: Substitution of 0.9 into the speed for the return home ($x - 2$) would give a negative value
17	Height s.f. = $20 \div 12 = \frac{5}{3}$ Vol s.f. = $(\frac{5}{3})^3$ V = $162 \times (\frac{5}{3})^3$	750	**3**	B1 for volume s.f. M1 for vol s.f. × 162 A1 cao

Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics

Unit 4 – Section B (Non-Calculator)

Higher Tier

Specimen Terminal Paper

Time: 1 hour 10 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
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Advice to Candidates

Show all stages in any calculations.
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If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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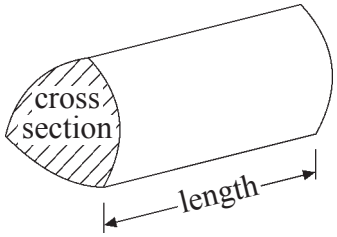
Formulae: Higher Tier

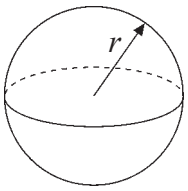
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



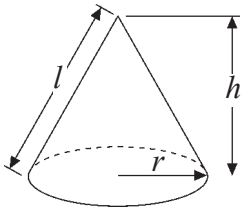
Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$

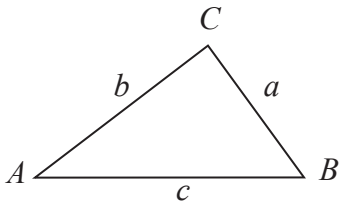


Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$



In any triangle ABC



Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle $= \frac{1}{2}ab\sin C$

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

Leave blank

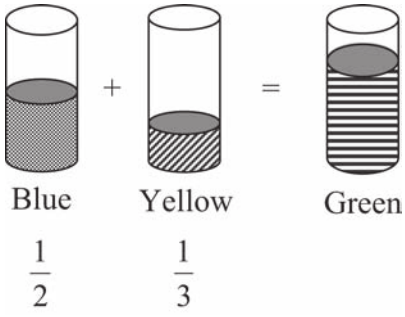
Answer ALL SEVENTEEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. Malcolm has half of a tin of blue paint.

Stuart has a third of a tin of yellow paint.



Stuart pours all his paint into Malcolm's tin to make green paint.

What fraction of a tin of paint is now in Malcolm's tin?

.....

Q1

(Total 3 marks)

2. The total cost of a TV is £60 plus VAT at $17\frac{1}{2}\%$

Work out the total cost.

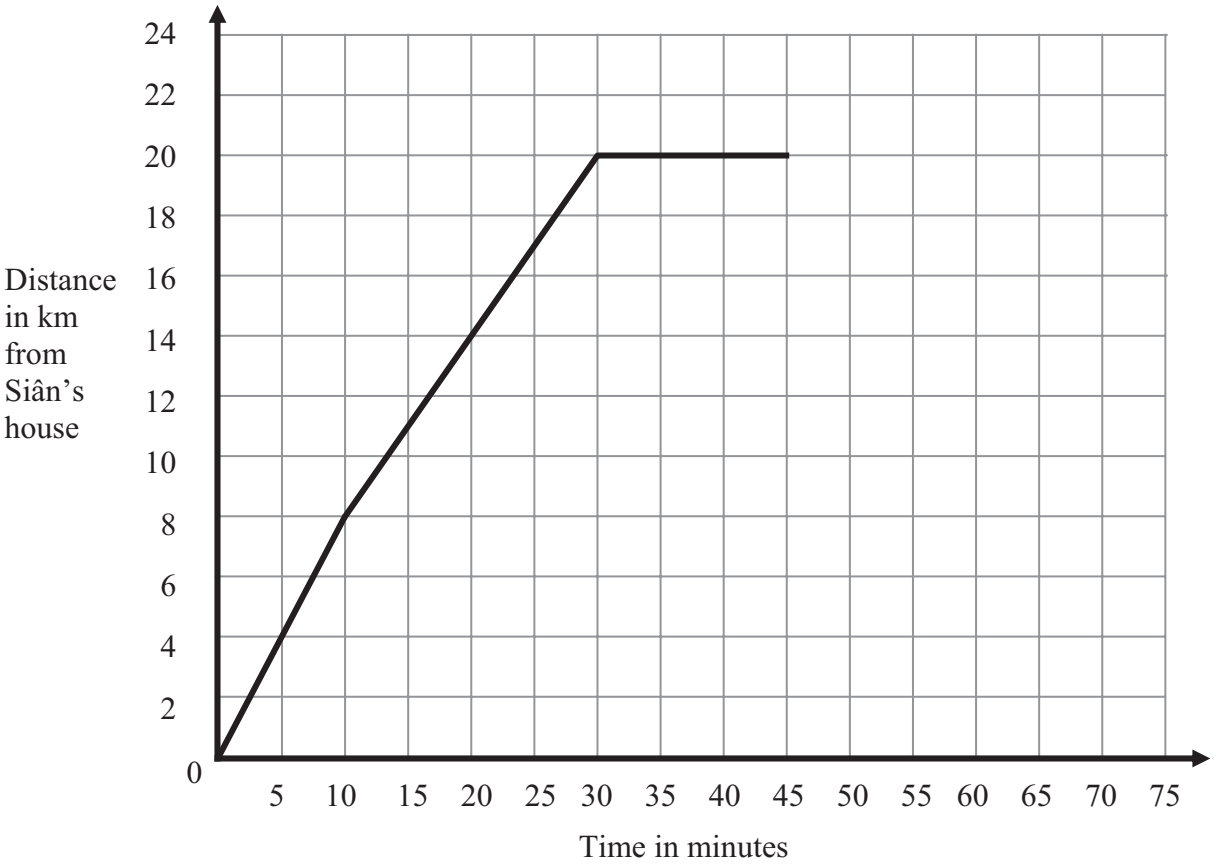
£ .....

Q2

(Total 3 marks)

Leave blank

3. Here is part of a travel graph of Siân's journey from her house to the shops and back.



(a) Work out Siân's speed for the first 10 minutes of her journey.
Give your answer in km/h.

..... km/h
(2)

Siân spent 15 minutes at the shops.
She then travelled back to her house at 60 km/h.

(b) Complete the travel graph.

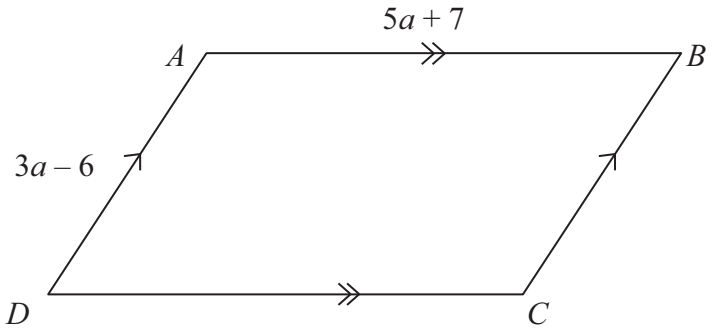
(2)

Q3

(Total 4 marks)

Leave blank

4. *ABCD* is a parallelogram.



The diagram shows the lengths in centimetres of two sides of the parallelogram.
The perimeter of the parallelogram is 58 cm.

Work out the length *AB*.

..... cm

(Total 4 marks)

Q4

5. A college wants to buy 570 calculators.
They are sold in boxes of 50.
Work out the number of boxes the college should buy.

.....

(Total 2 marks)

Q5

Leave blank

6. Rosa makes pizzas.

She uses cheese, topping and dough in the ratios 2 : 3 : 5
Rosa uses 70 grams of dough.

Work out the number of grams of cheese and the number of grams of topping Rosa uses.

Cheese ..... g

Topping ..... g

(Total 3 marks)

Q6

7. (a) Work out:

$$2\frac{11}{12} \div 1\frac{7}{8}$$

Write your answer as a mixed number in its simplest form.

.....

(3)

(b) Work out the value of $1\frac{2}{5} + 2\frac{3}{7}$

Give your answer as a fraction in its simplest form.

.....

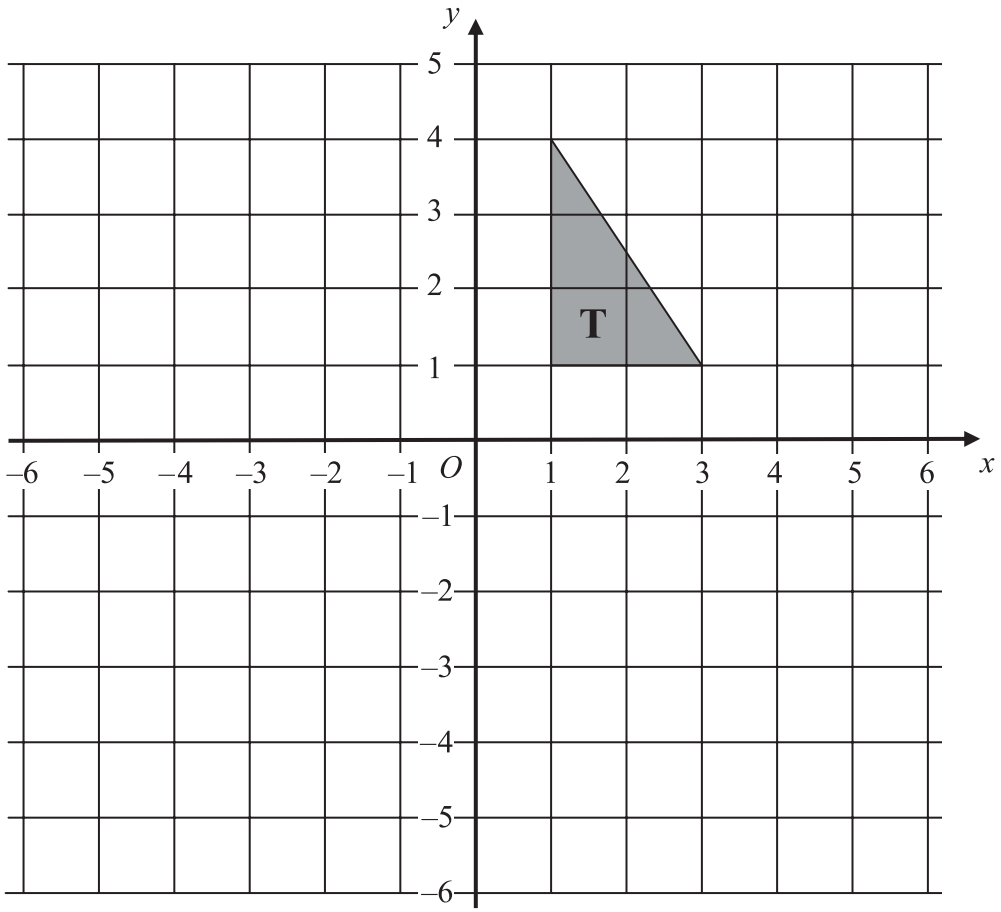
(3)

(Total 6 marks)

Q7

Leave blank

8.



(a) Reflect triangle **T** in the line $x = -1$.

(2)

(b) Rotate triangle **T** 90° clockwise using centre (0, 0).

(3) **Q8**

(Total 5 marks)

9. A straight line is given by the equation $y = \frac{1}{2}x + 7$

Write down the gradient of the line (m) and the y-coordinate of the point where it cuts the y-axis (c).

m = ...

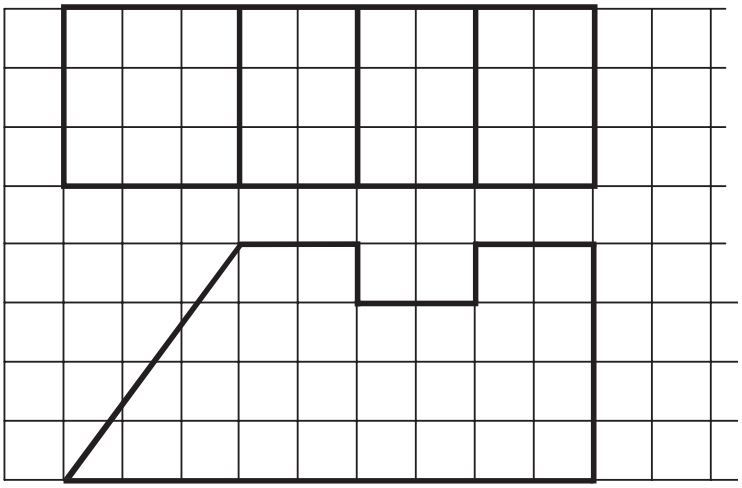
c = ... **Q9**

(Total 2 marks)

Leave blank

10. Here are the plan and front elevation of a prism.
The front elevation shows the cross section of the prism.

Plan



Front Elevation

In the space below, draw a 3-D sketch of the prism.

Q10

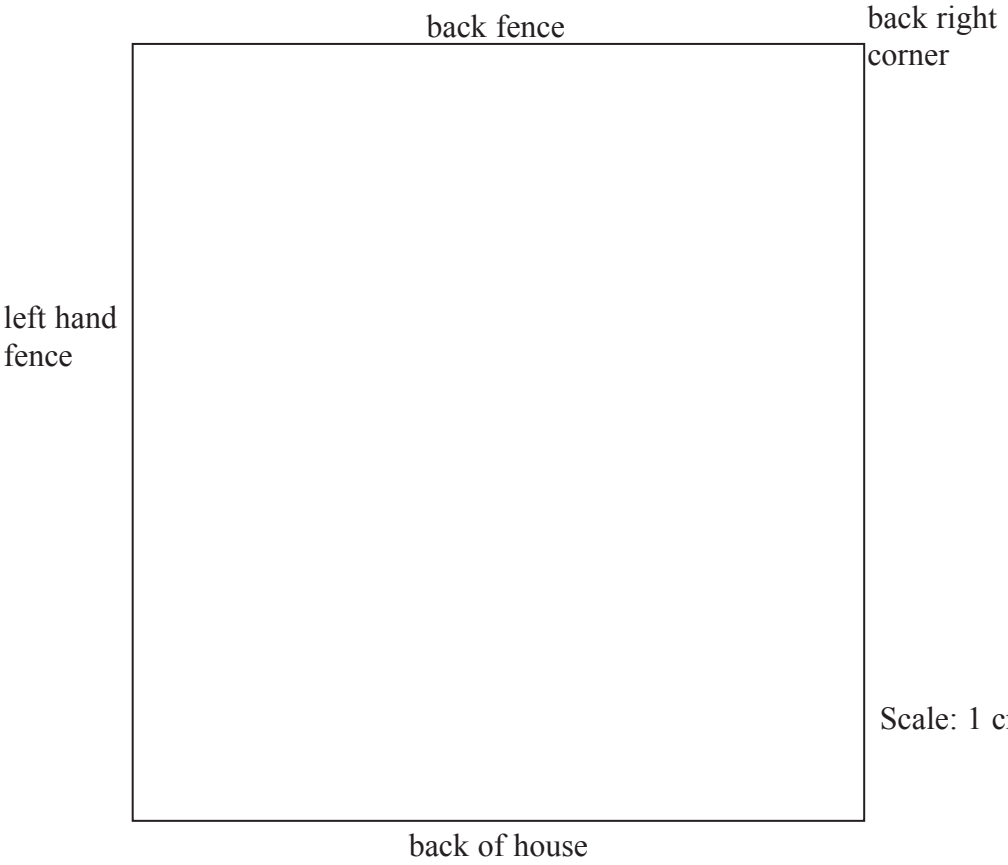
(Total 2 marks)

Leave blank

11. Derek wants to plant a tree in his rectangular garden.

The tree has to be:
more than 5 metres from the back of the house,
nearer to the left hand fence than the back fence,
less than 8 metres from the back right hand corner of the garden.

On the diagram, shade the region where the tree could be planted.
Use a scale of 1 cm to represent 1 m.



Q11

(Total 6 marks)

Leave blank

12. A haulage contractor has two types of lorry.

The type *A* lorries can carry 50 tonnes and make a profit of £400 each day.
The type *B* lorries can carry 60 tonnes and make a profit of £750 each day.

The contractor used *a* type *A* lorries and *b* type *B* lorries on one day.
On this day the lorries carried 730 tonnes and made a profit of £8000

Work out the number of type *A* lorries and type *B* lorries the contractor used that day.

..... type *A* lorries

..... type *B* lorries **Q12**

(Total 5 marks)

Leave blank

13. The loudness (L) of a loudspeaker, in decibels, varies inversely as the square of the distance (d), in metres, from the loudspeaker.

When $L = 200$ decibels, $d = 5$ metres

Calculate the distance you need to be from the loudspeaker when the loudness is 50 decibels.

..... m

(Total 4 marks)

Q13

Leave blank

14.

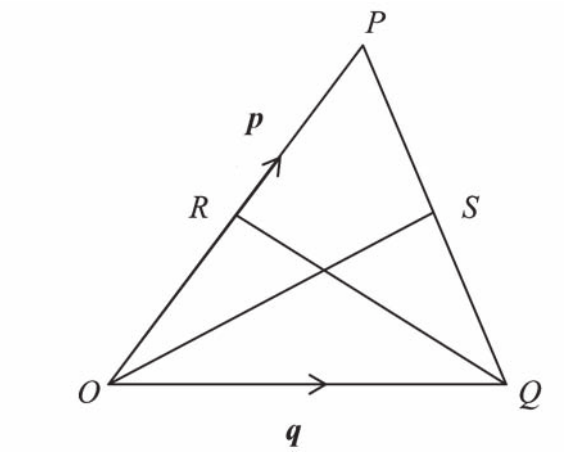


Diagram **NOT** accurately drawn

OPQ is a triangle
R is the midpoint of *OP*
S is the midpoint of *PQ*

$\overrightarrow{OP} = \boldsymbol{p}$ and $\overrightarrow{OQ} = \boldsymbol{q}$

(i) Express $\overrightarrow{OS}$ in terms of $\boldsymbol{p}$ and $\boldsymbol{q}$.

$\overrightarrow{OS}$ = ...

(ii) Prove that *RS* is parallel to *OQ*.

Q14

(Total 5 marks)

Leave blank

15. Solve $\dfrac{2}{x+1} + \dfrac{3}{x-1} = \dfrac{5}{x^2-1}$

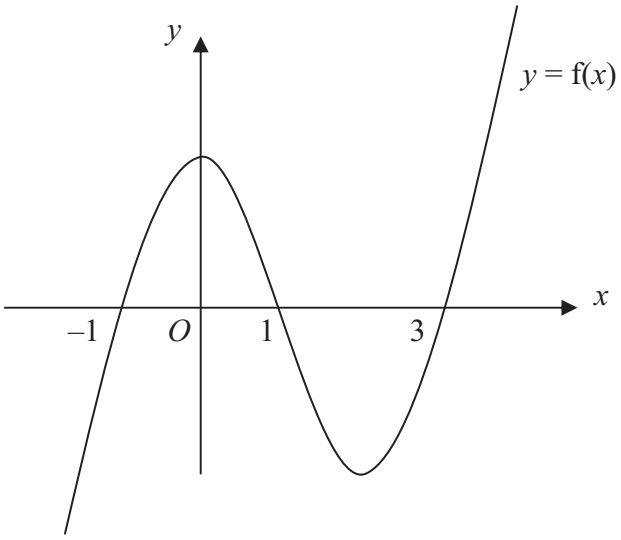
$x =$ .....

Q15

(Total 4 marks)

Leave blank

16. $y = f(x)$ is a function of x.



The graph of $y = f(x)$ cuts the x axis when $x = –1$, 1 and 3

Write down the coordinates of the points where these graphs cut the x axis.

(i) $y = f(– x)$

.....

(ii) $y = –f(x + 5)$

.....

Q16

(Total 2 marks)

TOTAL FOR SECTION B: 60 MARKS

END

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GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Terminal (Unit 4) Higher Section B

Questions	Working	Answer	Mark	Notes
1	$\frac{3}{6}+\frac{2}{6}$	$\frac{5}{6}$	**3**	M1 for using 6ths oe M1 for $\frac{3}{6}$ and $\frac{2}{6}$ or $\frac{10}{12}$ A1 for $\frac{5}{6}$ cao
2	10% of £60 = £6 5% of £60 = £3 $2\frac{1}{2}$% of £60 = £1.50 £60 + £10.50	£70.50	**3**	M1 for $17\frac{1}{2}$% of £60 M1ft for adding their $17\frac{1}{2}$% A1 cao
3 (a)		48	**2**	M1 for realising 6 × 10 = 60 so 8 × 6 A1 for 48
(b)			**2**	B2 for connecting (45, 20) to (65, 0) (B1 for connecting (30, 20) to (50, 0)
4	$10a + 14 + 6a – 12 = 58$ $16a + 2 = 58$ $16a = 56$ $a = 3.5$ length = 5 × 3.5 + 7	24.5	**4**	M1 for forming equation M1 for $16a + 2 = 56$ A1 for $a = 3.5$ B1 for length = 24.5
5	570 ÷ 50 = 11.4	12	**2**	M1 for 570 ÷ 50 A1 cao
6	70 ÷ 5 × 2 70 ÷ 5 × 3	28, 42	**3**	B3 for both correct B2 for one correct B1 for 70 ÷ 5 seen

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Terminal (Unit 4) Higher Section B

Questions	Working	Answer	Mark	Notes
7 (a)	$2\frac{11}{12} \div 1\frac{7}{8} = \frac{35}{12} \div \frac{15}{8}$ $\frac{35}{12} \div \frac{15}{8} = \frac{35\times8}{12\times15} = \frac{14}{9} = 1\frac{5}{9}$	$\frac{14}{9}$ or $1\frac{5}{9}$	**3**	M1 for converting to 12ths and 8ths M1 for reversing one fraction and multiplying A1 cao
(b)	$1\frac{2}{5} + 2\frac{3}{7} = \frac{7}{5} + \frac{17}{7}$ $\frac{7}{5} + \frac{17}{7} = \frac{49+85}{35} = \frac{134}{35}$	$3\frac{29}{35}$	**3**	M1 for converting to 5ths and 7ths M1 for cross-multiplying A1 cao
8 (a)	Reflection in $x = -1$		**2**	M1 for any reflection in a line parallel to $x = -1$ A1 for correct position
(b)	Rotation 90º about the origin		**3**	M1 for any rotation of 90º M1 if centre (0,0) used as centre A1 for correct position
9		$m = \frac{1}{2}$ c = 7	**2**	B1 B1
10		3-D sketch	**2**	B1 for cross-section correct B1 for 3-D image
11			**6**	B1 for line 5 cm from house and parallel to house B1 for angle bisector of top LH corner B1 for accuracy 45 ± 2º B1 for circular arc center top RH corner B1 for accuracy ± 2 mm B1 for shading combined region

Questions	Working	Answer	Mark	Notes
12	$50a + 60b = 730$ [1] $400a + 750b = 8000$ [2] Mult eqn [1] by 8 $400a + 480b = 5840$ $400a + 750b = 8000$ Subtract $270b = 2160$ $b = 8$ $50a + 480 = 730$ $a = 250/50$	$A = 5$ $B = 8$	**5**	B2 for both equations (B1 for 1 equation correct) M1 for isolating a or b A1 for one value correct A1 for second value correct
13	$200 = \frac{k}{25}$ $k = 5000$ $L = 50$ $50 = \frac{5000}{d^2}$ $d^2 = 100$	10	**4**	M1 for $200 = \frac{k}{25}$ A1 for $k = 5000$ M1 for $50 = \frac{5000}{d^2}$ A1 for 10

GCSE MATHEMATICS
MARK SCHEME – Specimen Paper – Terminal (Unit 4) Higher Section B

Questions	Working	Answer	Mark	Notes
14 **(i)**	$PS = \frac{1}{2}(\mathbf{q} - \mathbf{p})$ $OS = \mathbf{p} + \frac{1}{2}(\mathbf{q} - \mathbf{p})$	$= \frac{1}{2}(\mathbf{p} + \mathbf{q})$	**3**	B1 for $\overrightarrow{PS} = \frac{1}{2}(\mathbf{q} - \mathbf{p})$ M1 for $\overrightarrow{RS} = \frac{1}{2}\mathbf{p} + \frac{1}{2}(\mathbf{q} - \mathbf{p})$ A1 for $\frac{1}{2}(\mathbf{p} + \mathbf{q})$
(ii)	$\overrightarrow{RS} = \overrightarrow{RP} + \overrightarrow{PS}$ $\overrightarrow{RS} = \frac{1}{2}\mathbf{p} + \frac{1}{2}(\mathbf{q} - \mathbf{p})$ $\overrightarrow{RS} = \frac{1}{2}\mathbf{q}$ $\overrightarrow{OQ} = \mathbf{q}$ Therefore RS is parallel to OQ		**2**	B1 for $\overrightarrow{RS} = \frac{1}{2}\mathbf{q}$ and $\overrightarrow{OQ} = \mathbf{q}$ B1 for RS parallel to OQ
15	$2(x - 1) + 3(x + 1) = 5$ $2x - 2 + 3x + 3 = 5$ $5x + 1 = 5$ $5x = 4$	$x = 0.8$	**4**	M2 for $2(x - 1) + 3(x + 1) = 5$ (M1 if only one expression correct) M1 for $5x + 1 = 4$ A1 for 0.8 oe
16	(–3, 0), (–1, 0), (1, 0) (–6, 0), (–4, 0), (–2, 0)		**1** **1**	B1 cao B1 cao

NOTES ON MARKING PRINCIPLES

1 Types of mark

- M marks: method marks
- A marks: accuracy marks
- B marks: unconditional accuracy marks (independent of M marks)

2 Abbreviations

cao – correct answer only
ft – follow through
isw – ignore subsequent working
SC: special case
oe – or equivalent (and appropriate)
dep – dependent
indep - independent

3 No working

If no working is shown then correct answers normally score full marks
If no working is shown then incorrect (even though nearly correct) answers score no marks.

4 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.
If there is no answer on the answer line then check the working for an obvious answer.

5 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

6 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. incorrect cancelling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

7 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

8 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

9 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

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