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8 – 9	
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12 – 13	
TOTAL	

In the style of AQA

General Certificate of Secondary Education
Higher Tier

Mathematics 43602H

Past Paper Type Questions by Topic

Combined Booklets

H

For this paper you must have:
- a calculator
- mathematical instruments.

Time allowed
- 1 hour

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
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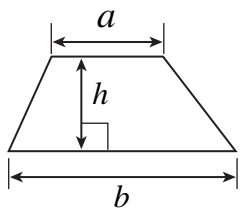
Advice
- In all calculations, show clearly how you work out your answer.

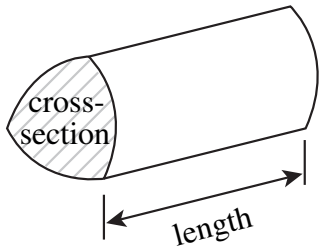
By Peter Bland

Formulae Sheet: Higher Tier

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

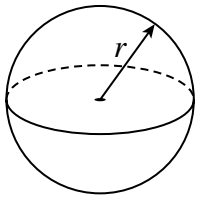


Volume of prism = area of cross-section × length



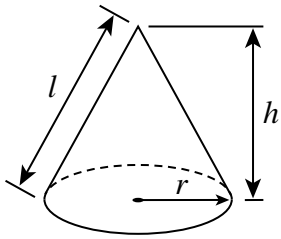
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

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

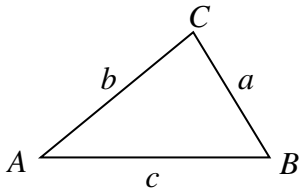


In any triangle ABC

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

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

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



The Quadratic Equation

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

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

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10–11	
TOTAL	

In the style of

General Certificate of Secondary Education
Foundation Tier

Mathematics 43601H

Past Paper Questions by Topic

A* Questions 1H

H

For this paper you must have: • mathematical instruments. You must **not** use a calculator.	

Time allowed
- 1 hour 15 minutes

Instructions
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Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1 The ticket office at an ice rink records the tickets that skaters buy. Here are Monday's sales, along with the charges.

Length of time (hours)	Number of skaters	Charge (£)
0 – 1	90	1.20
1 – 2	130	2.00
2 – 3	80	3.50
more than 3	60	5.00

Monday's results are equivalent to a 20% sample for the whole week, stratified by the four time intervals.

Work out the ice rink takings for the whole week.

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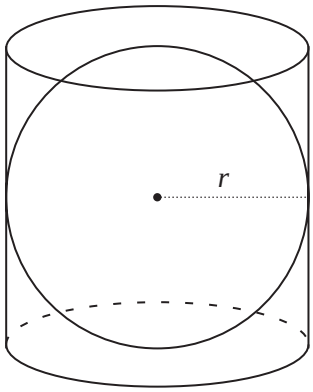
Answer £ ..... *(3 marks)*

2 A golf ball of radius r is packaged in a cylindrical box.
The ball touches the sides, top and base of the box.



What fraction of the volume of the box is empty space?
You **must** show all your working.

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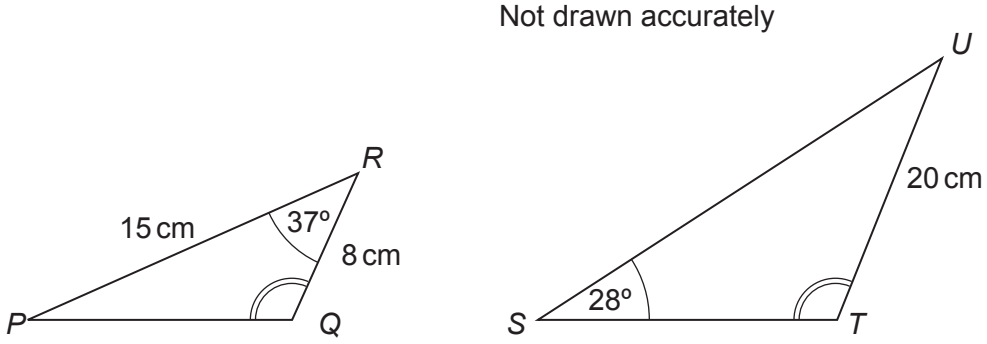
Answer ..... *(4 marks)*

3 Triangles *PQR* and *STU* are similar. Angle *PQR* = angle *STU*.



3 (a) Work out the size of angle *STU*.

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Answer ..... degrees *(2 marks)*

3 (b) Calculate the length of *SU*.

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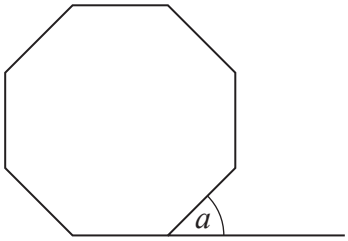
Answer ..... cm *(3 marks)*

4 The diagram shows a regular octagon.



Not drawn accurately

4 (a) Explain why the exterior angle of a regular octagon, marked a on the diagram, is 45°

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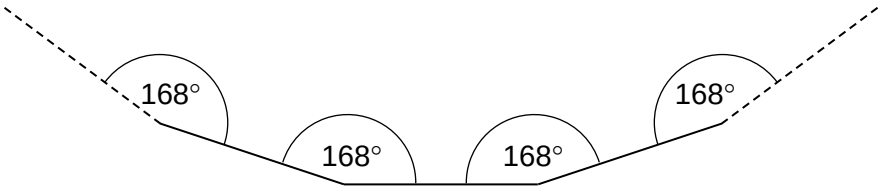
(1 mark)

4 (b) The diagram shows part of a regular polygon.
Each interior angle is 168°.



Not drawn accurately

Calculate the number of sides of this regular polygon.

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Answer ..... *(3 marks)*

5 The table shows the profits of a shop during each quarter from March 2010 to June 2011. The March 2011 entry is missing from the table.

Date	Mar 10	June 10	Sept 10	Dec 10	Mar 11	June 11
Profits	38 000	29 000	25 000	34 000		21 000

5 (a) Calculate the first four-point moving average.

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Answer £ ..... *(2 marks)*

5 (b) The second four-point moving average is £28 000

Calculate the missing entry for March 2011.

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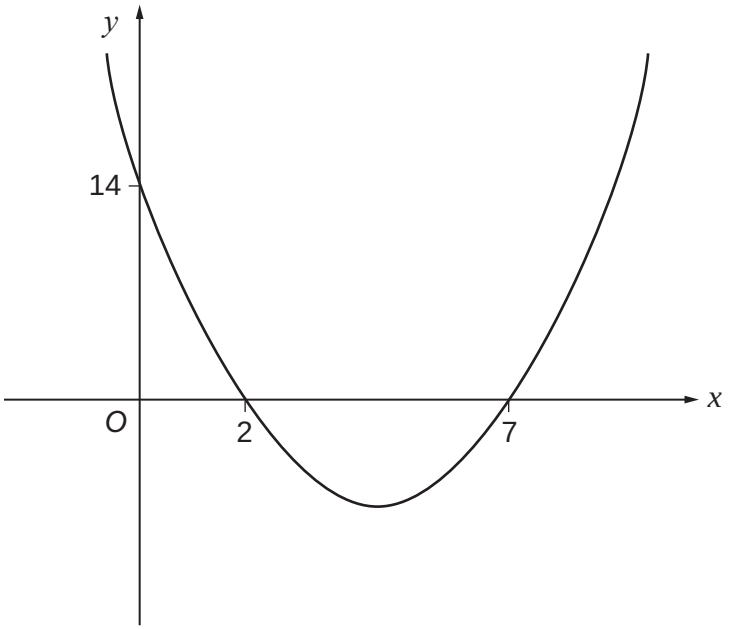
Answer £ ..... *(2 marks)*

6 This diagram shows the graph of $y = x^2 + px + q$

Not drawn accurately



Find the values of p and q. You **must** show all your working.

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Answer p = ... , q = ... *(3 marks)*

✳**7** A coffee machine dispenses 130 millilitres of black coffee into cups with a capacity of 175 millilitres.

These values are accurate to 3 significant figures.

Milk is supplied in small cartons which contain 21 millilitres, accurate to the nearest millilitre.

David likes milky coffee and always puts 2 cartons of milk in his coffee.

Will David's cup ever overflow?

You **must** show your working.

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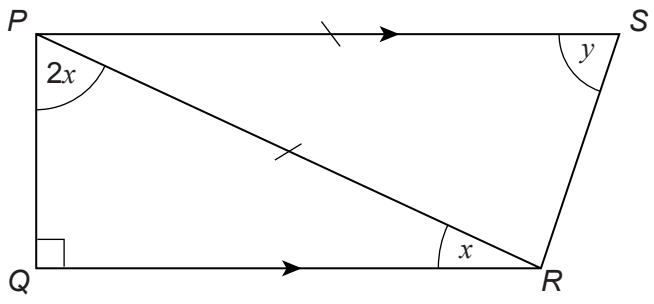
(5 marks)

8 *PQRS* is a trapezium with *PS* parallel to *QR*.
Triangle *PQR* is right-angled at *Q*.
Triangle *PSR* is isosceles with *PS* = *PR*
Angle *QPR* = $2x$
Angle *QRP* = x
Angle *PSR* = y

Not drawn accurately



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

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Answer ..... degrees *(2 marks)*

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

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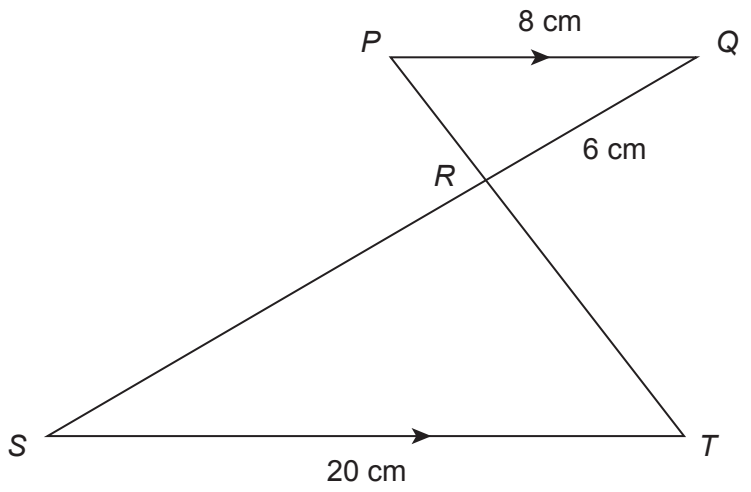
Answer ..... degrees *(3 marks)*

9 In the diagram, *PQ* is parallel to *ST*.
PQ = 8 cm, *QR* = 6 cm and *ST* = 20 cm



Not drawn accurately

9 (a) Explain why triangles *PQR* and *TSR* are similar.
You **must** give reasons for any statements you make.

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(3 marks)

9 (b) Work out the length of *SR*.

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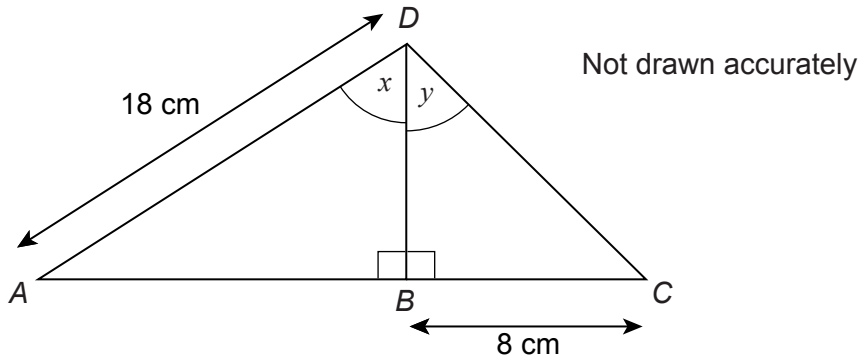
Answer ..... cm *(3 marks)*

10 The diagram shows two right-angled triangles *ABD* and *CBD*.
AD = 18 cm and *BC* = 8 cm
cos x = tan y



Work out the length of *BD*.

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Answer ..... cm *(3 marks)*

11 Make x the subject of the formula $y = \dfrac{w + x}{x - 2}$

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Answer ..... *(4 marks)*

12 Convert $\frac{7}{11}$ to a recurring decimal.

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Answer ..... *(2 marks)*

12 (b) Prove that the recurring decimal 0.3939... can be written as $\frac{13}{33}$

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(3 marks)

13 y is inversely proportional to x.
z is directly proportional to the square root of y.
When $x = 8$, $y = 9$
When $y = 16$, $z = 20$

Use this information to find the value of z when $x = 2$

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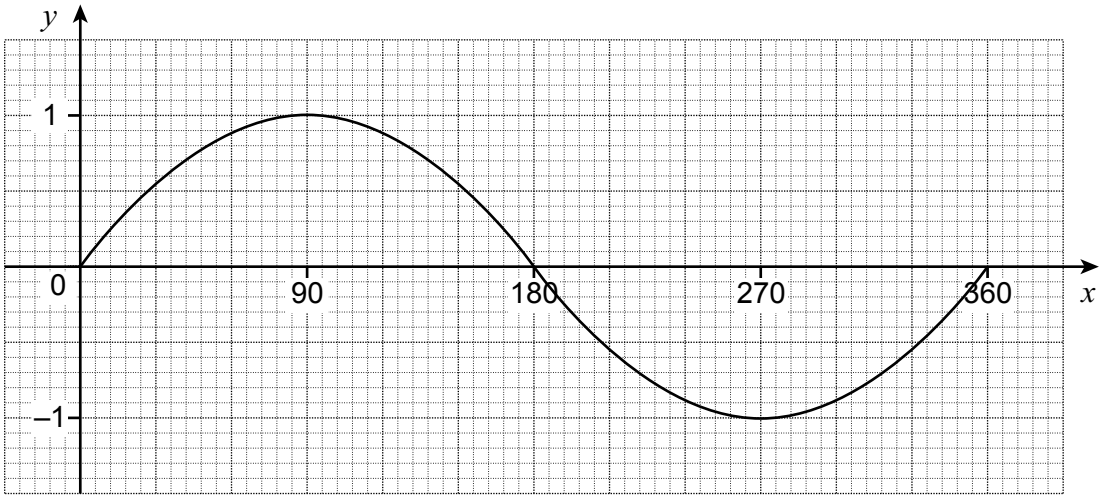
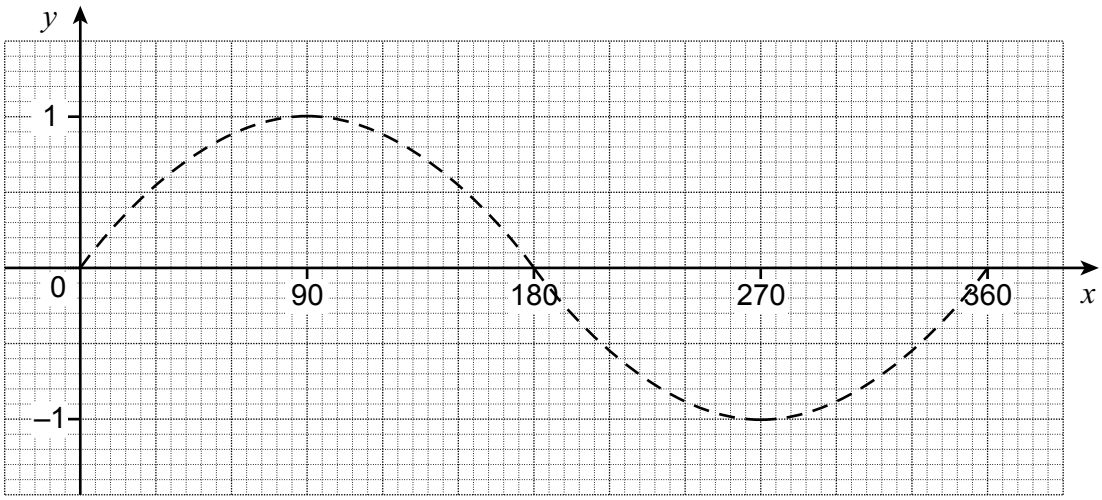
Answer ..... *(6 marks)*

14 This is the graph of $y = \sin x$ for $0° \leqslant x \leqslant 360°$



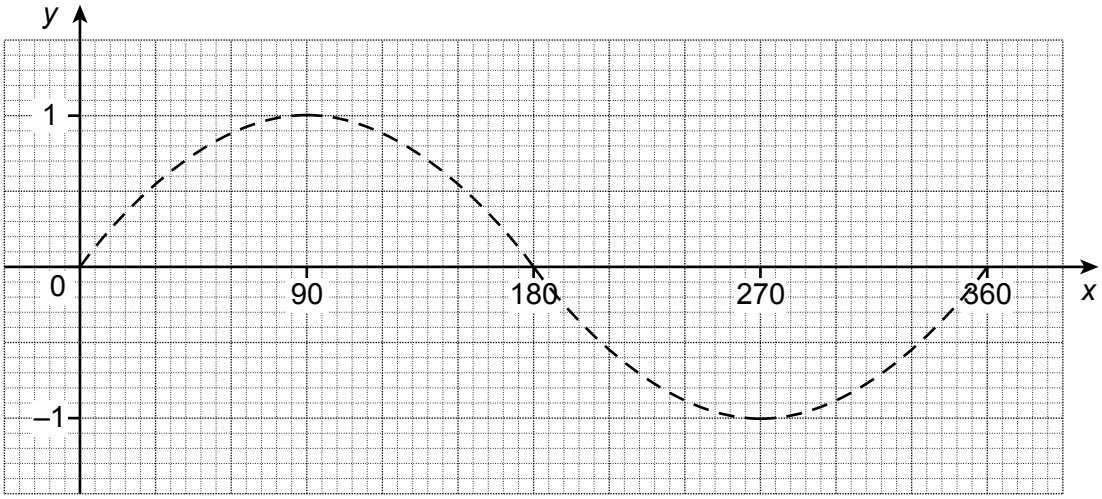
On the axes draw the following graphs for $0° \leqslant x \leqslant 360°$
The graph of $y = \sin x$ is shown dotted to help you.

14 (a) $y = \sin (x + 90)$



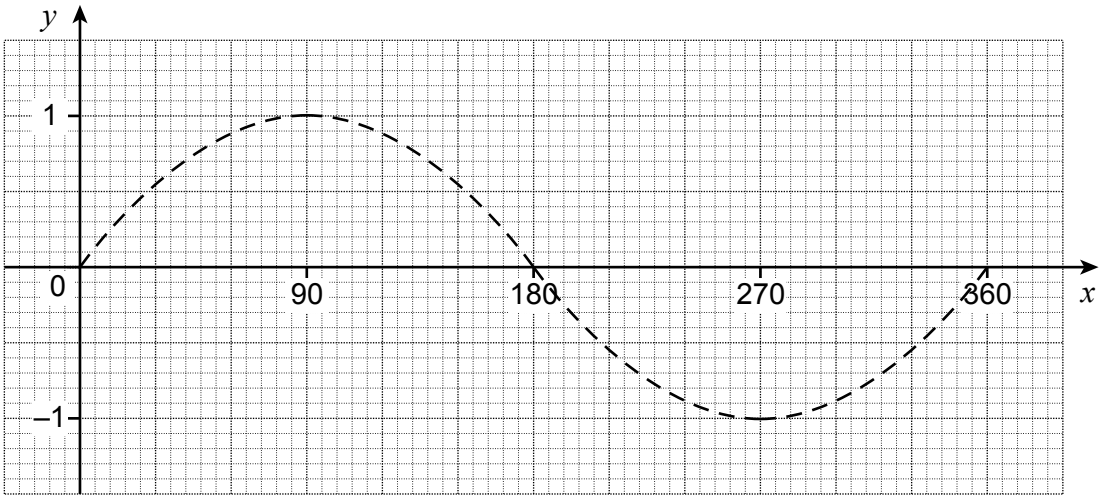
(1 mark)

14 (b) $y = \frac{1}{2} \sin x$



(1 mark)

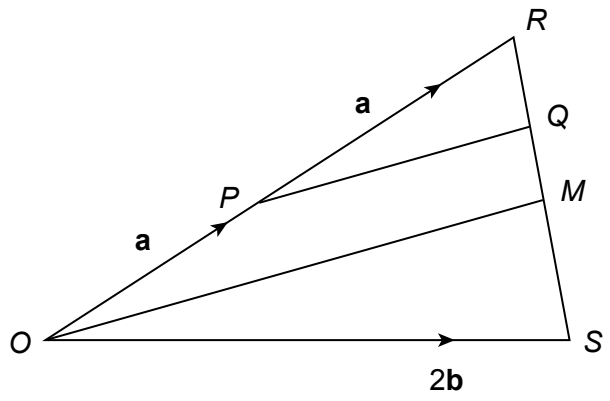
14 (c) $y = \sin \frac{x}{2}$



(1 mark)

15 *ORS* is a triangle with *P* the mid-point of *OR* and *M* the mid-point of *RS*.

$OP = \mathbf{a}$, $\overrightarrow{PR} = \mathbf{a}$ and $\overrightarrow{OS} = 2\mathbf{b}$



Not drawn accurately

15 (a) Write down an expression for *RS* in terms of **a** and **b**.

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Answer ..... *(1 mark)*

15 (b) *Q* lies on *RS* such that $\overrightarrow{RQ} = \frac{1}{4}\overrightarrow{RS}$

Show that $\overrightarrow{PQ} = \frac{1}{2}\mathbf{a} + \frac{1}{2}\mathbf{b}$

Explain your answer.

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Answer ..... *(2 marks)*

15 (c) Write down, and simplify, an expression for $\overrightarrow{OM}$ in terms of **a** and **b**.

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Answer ..... *(2 marks)*

(d) Explain why the answers for part (b) and part (c) show that *OPQM* is a trapezium.

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(1 mark)

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In the style of AQA

General Certificate of Secondary Education
Higher Tier

Mathematics 43602H

Past Paper Type Questions by Topic

A* Questions 2H

H

For this paper you must have:
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- mathematical instruments.

Time allowed
- 1 hour

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Advice
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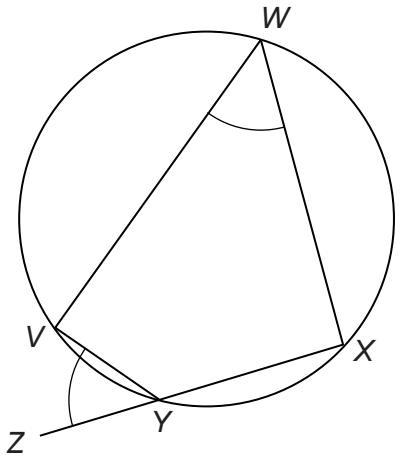
By Peter Bland

1 *VWXY* are points on the circumference of a circle.
The line *XY* is extended to *Z*.



Not drawn accurately

Prove that $\angle VWX = \angle VYZ$

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(3 marks)

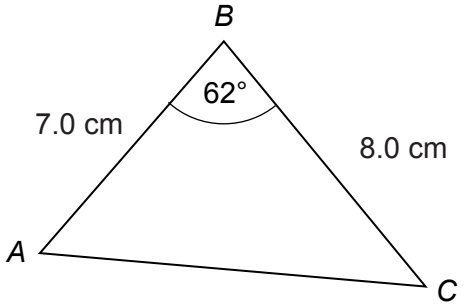
2 (a) Sophie draws a line 6.0 cm long to the nearest mm.

Which of the following is the upper limit of the length of the line?
Circle the correct answer.

6.04 cm 6.05 cm 6.1 cm 6.5 cm

(1 mark)

2 (b) Sophie constructs the triangle *ABC* using a ruler and protractor.
She draws *AB* = 7.0 cm, to the nearest mm.
She draws *BC* = 8.0 cm, to the nearest mm.
She draws angle *ABC* = 62° to the nearest degree.



Not drawn accurately

Calculate the greatest possible area of the triangle.

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Answer ..... cm^2

(4 marks)

3 A solution of $x^3 + 5x = 130$ is between 4 and 5

Use trial and improvement to find this solution.
Give your answer to one decimal place.

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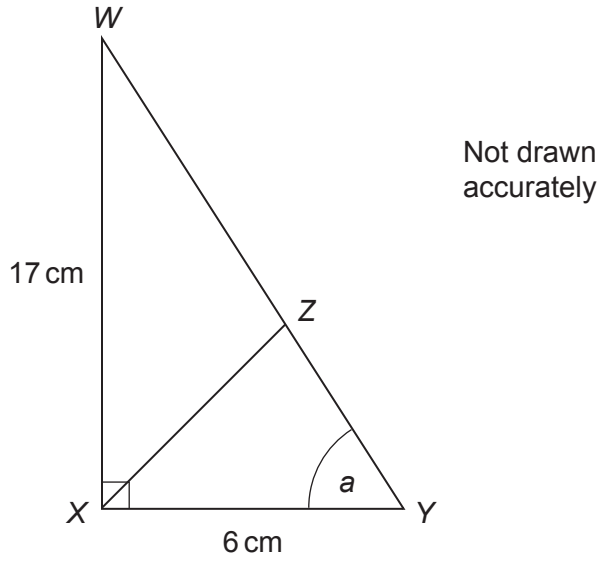
Answer x = ... *(3 marks)*

4 *WXY* is a right-angled triangle.
WX = 17 cm and *BC* = 6 cm.
The line *XZ* bisects the angle *WXY*.



4 (a) Write down the value of tan *a*.

Answer ..... *(1 mark)*

4 (b) Calculate the length *XZ*.

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Answer ..... cm *(5 marks)*

5 The diagram shows two circles, C_1 and C_2.

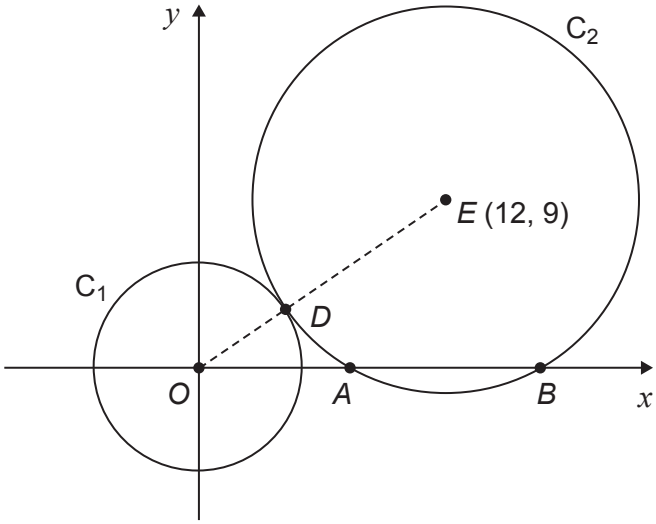
The centre of C_1 is at the origin, O.

The centre of C_2 is at E (12, 9).

The radius of C_2 is twice the radius of C_1.

The circles touch at the point D.

The circle C_2 crosses the x-axis at A and B.



Not drawn accurately

Calculate the distance AB.

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Answer ..... cm *(5 marks)*

6 Work out the value of y if $$\frac{y\sqrt{2}}{5-\sqrt{3}} = 5+\sqrt{3}$$

Give your answer in the form of $a\sqrt{b}$ where a and b are integers.

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Answer x = ... *(4 marks)*

***6** The sum of the squares of two consecutive integers is one greater than twice the product of the integers.

For example $8^2 + 9^2 = 64 + 81$ and $2 \times 8 \times 9 = 144$
$= 145$

Prove this result algebraically.

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(5 marks)

7 The costs per mile, in pence, and the flight distance, in thousands of miles, are shown for 10 flights on Easyway airlines.

Flight	A	B	C	D	E	F	G	H	I	J
Distance (Thousands of miles)	0.3	0.5	0.8	1.0	1.2	1.4	1.7	2.6	3.3	3.9
Cost per mile (pence)	6.4	5.8	6.2	5.7	5.0	4.6	4.4	3.4	2.4	1.8

7 (a) Calculate the cost of the ticket for flight A.

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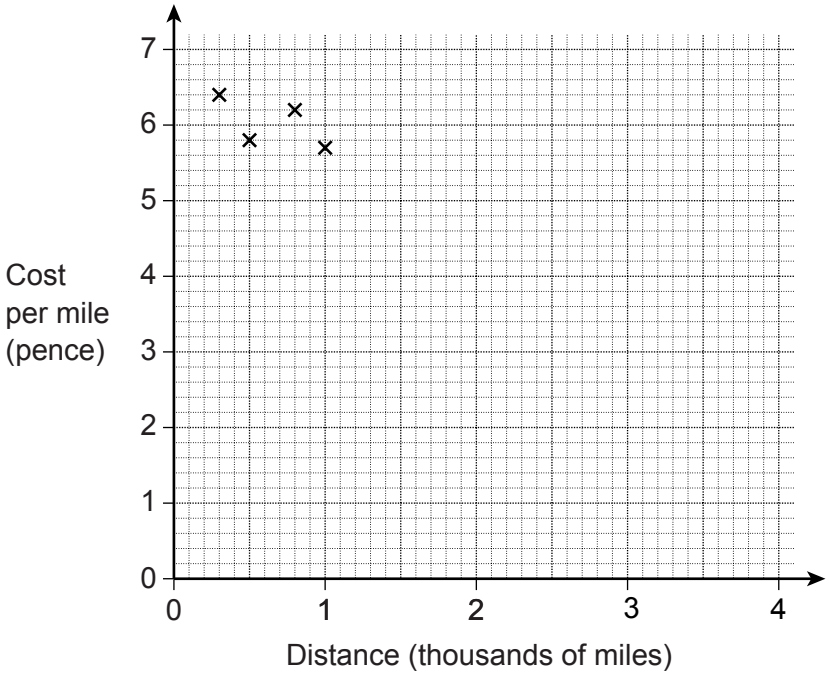
Answer £ ..... *(2 marks)*

7 (b) The data for the first four flights has been plotted on the scatter diagram.

Plot the data for the remaining flights.



(2 marks)

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

(1 mark)

7 (d) Estimate the cost per mile, in pence, of a flight of 2000 miles.

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Answer ..... pence *(1 mark)*

7 (e) The scatter diagram shows negative correlation.

Explain what this means for the relationship between the cost per mile and the distance of the flight.

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(1 mark)

8 The time, T, in seconds, that a pendulum takes to do a complete oscillation is given by the formula

$$T = 2\pi \sqrt{\frac{l}{g}}$$

where l is the length of the pendulum, in metres, and g is the acceleration due to gravity. Take the value of g to be 9.807 m/s^2.

In the Clock Tower of Big Ben in London there is a pendulum of length 4 m.

8 (a) (i) Calculate the value of T for this pendulum.
Give all the figures in your calculator display.
Give your answer as a decimal.

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Answer ..... seconds *(1 mark)*

8 (a) (ii) Give your answer to a suitable degree of accuracy.

Answer ..... seconds *(1 mark)*

8 (b) Calculate the length of a pendulum that will give a value of T = 1

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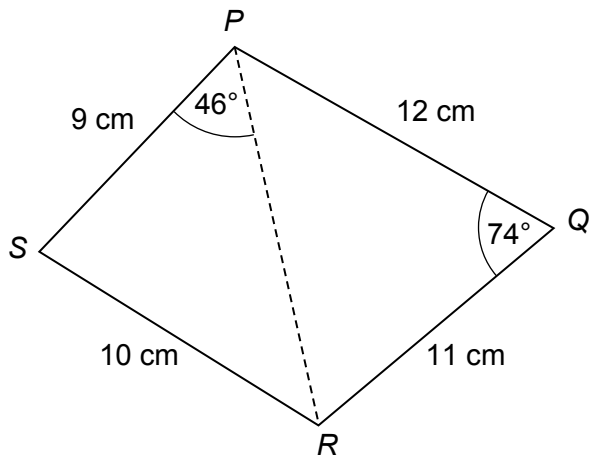
Answer ..... m *(4 marks)*

9 *PQRS* is a quadrilateral.
PQ = 12 cm, *QR* = 11 cm, *RS* = 10 cm and *SP* = 9 cm ∠ *PQR* = 74° and ∠ *SPR* = 46°



Not drawn accurately

9 (a) Use the cosine rule to find *PR*.

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Answer ..... cm *(3 marks)*

9 (b) Use the sine rule to find the size of angle *PRS*.

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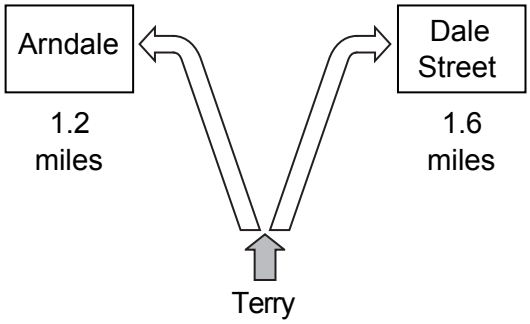
Answer ..... degrees *(3 marks)*

10 Terry is sitting in his car at some traffic lights.
He knows that he is 1.2 miles from Arndale and 1.6 miles from Dale Street.
He knows his average speed is 10 miles per hour in city traffic.



A sign on the traffic lights shows the number of spaces currently available in each car park. Terry is sitting at the lights for one minute.

In that time the sign changes as shown below.

START

	SPACES
Arndale	510
Dale Street	700

1 MINUTE LATER

	SPACES
Arndale	450
Dale Street	630

10 (a) It will take Terry 7.2 minutes to drive to Arndale at 10 mph.

How long will it take Terry to drive to Dale Street at 10 mph?

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Answer ..... minutes *(2 marks)*

10 (b) Which car park will give Terry the better chance of finding a space?
You **must** show your working.

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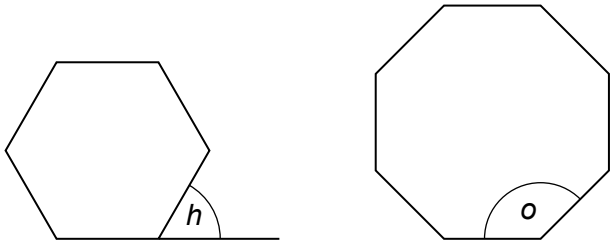
(4 marks)

11 A regular octagon and a regular hexagon have sides of the same length.



Not drawn accurately

11 (a) Write down the size of the exterior angle, *h*, of the hexagon.

.....

Answer ..... degrees *(1 mark)*

11 (b) Work out the size of the interior angle, *o*, of the octagon.

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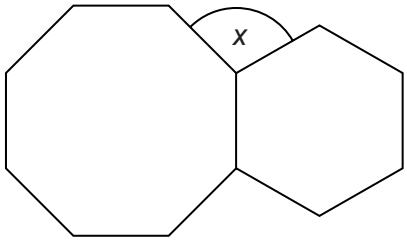
.....

Answer ..... degrees *(2 marks)*

11 (c) The octagon and the hexagon are placed together as shown.



Not drawn accurately

Work out the size of the angle marked *x*.

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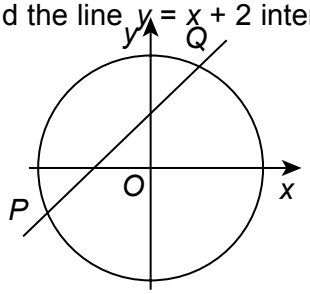
Answer ..... degrees *(2 marks)*

12 The circle $x^2 + y^2 = 16$ and the line $y = x + 2$ intersect at the points A and B.



Not drawn accurately

12 (a) Show algebraically that the x-coordinates of points P and Q satisfy the equation

$$x^2 + 2x - 6 = 0$$

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(3 marks)

12 (b) Write the equation $x^2 + 2x - 6 = 0$ in the form $(x + a)^2 - b = 0$

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Answer ..... *(2 marks)*

12 (c) Hence, or otherwise, solve the equation $x^2 + 2x - 6 = 0$
Give your answers in surd form.

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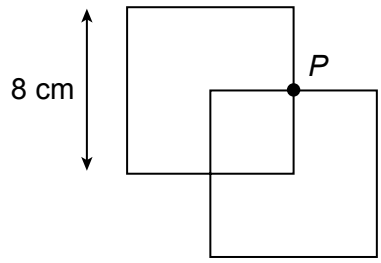
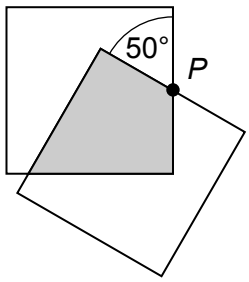
Answer ..... *(2 marks)*

13 Two squares with sides 8 cm overlap so that the corner of one square is at the centre of the other square, as shown in the first diagram.





Not drawn accurately

The lower square is rotated about the point *P* until the angle between the sides is 50° as shown in the second diagram.
The shaded area is a kite.

Calculate the shaded area.

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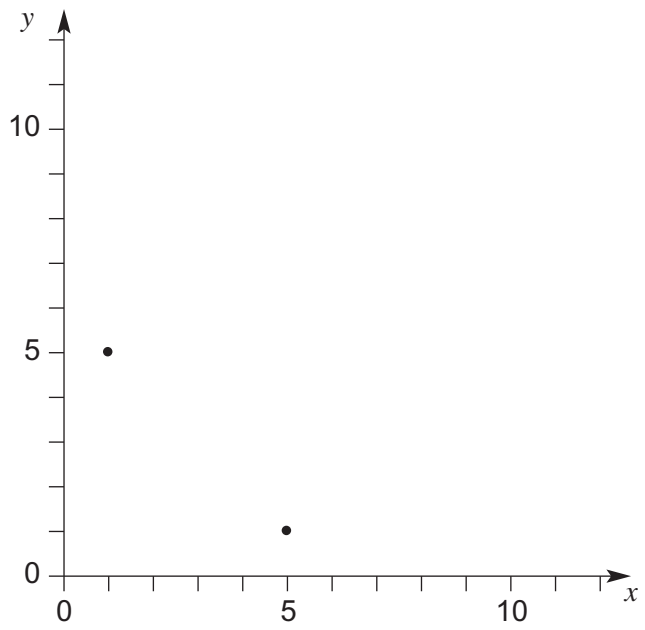
Answer ..... cm^2 *(5 marks)*

14 Two points (5, 1) and (1, 5) on the graph of $y = \frac{5}{x}$ for $x > 0$ are plotted.



14 (a) Complete a sketch of the graph of $y = \frac{5}{x}$ for $x > 0$

(2 marks)

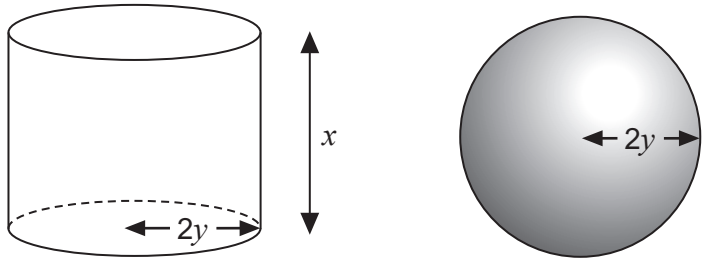
14 (b) Calculate the coordinates of the point where this curve intersects with the line $y = x$

.....

.....

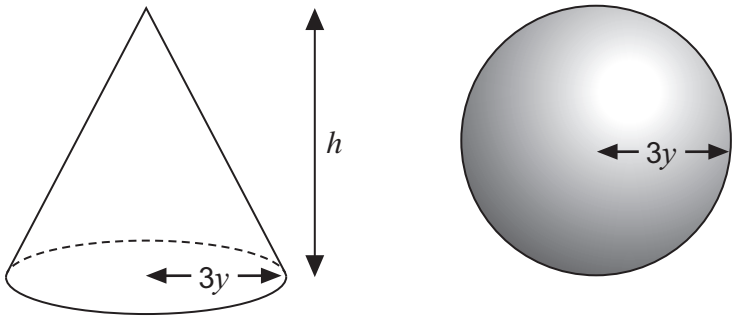
Answer (..... , ...) *(2 marks)*

15 This cylinder and sphere have the same volume.



Not drawn accurately

This cone and sphere also have the same volume



Not drawn accurately

Find h in terms of x

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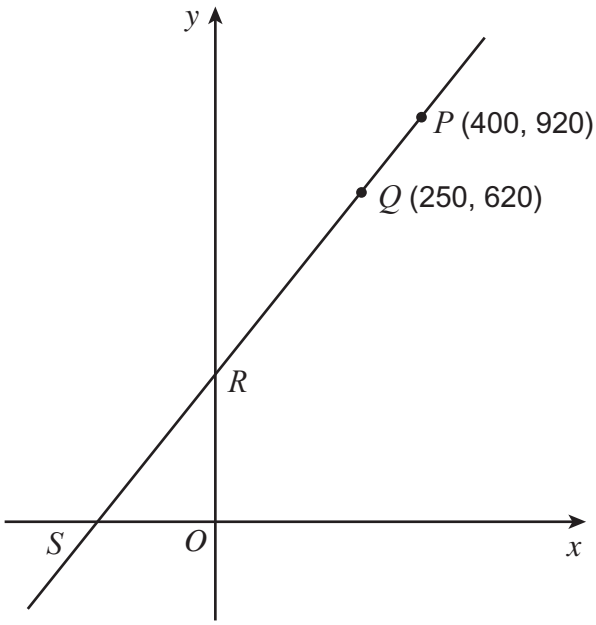
Answer ..... *(5 marks)*

16 The diagram shows a line $PQRS$.
P is the point (400, 920).
Q is the point (250, 620).
The line cuts the y-axis at R and the x-axis at S.

Not drawn accurately



Work out the coordinates of R and S.

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Answer R (..... , ...)

S (..... , ...) *(4 marks)*

Centre Number						Candidate Number				
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In the style of AQA

General Certificate of Secondary Education
Foundation Tier

Mathematics 43602F

Past Paper Type Questions by Topic

Algebra

F

For this paper you must have:
- a calculator
- mathematical instruments.

Time allowed
- 1 hour

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is.
- The quality of your written communication is specifically assessed in some questions. These questions are indicated with an asterisk (*)
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1 (a) Solve $4(y + 5) = 28$

.....

.....

.....

Answer y = ...

(3 marks)

1 (b) Factorise $x^2 + 8x$

.....

Answer .....

(1 mark)

2 You are given that 1 tonne = 1000 kilograms and 1 kilogram = 1000 grams

A skip contains half a tonne of magazines when full.
Each magazine weighs about 200 grams.

Approximately how many magazines would fill the skip?

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Answer .....

(4 marks)

3 (a) Work out the value of $3a + 4b$ when $a = 5$ and $b = \frac{1}{2}$

.....

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Answer ..... *(2 marks)*

3 (b) Solve $5x + 7 = x + 9$

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4 (a) Simplify $y^4 \times y^4$ Answer x =..... *(3 marks)*

.....

Answer .....

(1 mark)

4 (b) Simplify $y^4 \div y^4$

.....

Answer .....

(1 mark)

5 (a) Simplify $3x + 4x$

Answer ..... *(1 mark)*

5 (b) Simplify fully $\frac{12y}{6}$

Answer ..... *(1 mark)*

5 (c) $a = 5$ and $b = 4$

Work out the value $2a + 3b$

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Answer ..... *(2 marks)*

5 (d) Solve $7x + 1 = 36$

.....

.....

Answer $x =$ ..... *(2 marks)*

6 (a) Simplify 4x + 3x + 5x

.....

Answer .....

(1 mark)

6 (b) Work out the value of $7a + 2b$ when $a = 4$ and $b = 3$

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Answer .....

(2 marks)

7 Write 24 as the product of prime factors.

Give your answer in index form.

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Answer .....

(3 marks)

8 (a) Solve $7y > 2y + 20$

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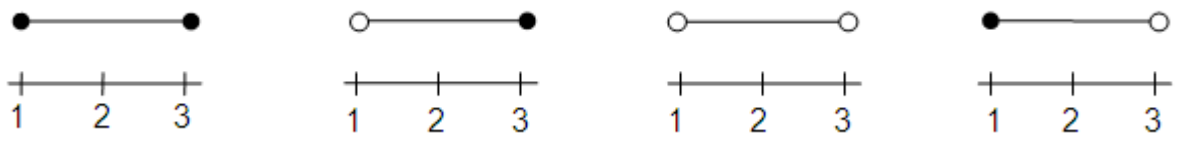
Answer .....

(2 marks)

8 (b) Circle the diagram that represents $1 \leq x < 3$



(*1 mark*)

9 A bag contains blue, red and yellow balls.

The number of blue balls is x

The number of red balls is $x + 3$

The number of yellow balls is $2x$

9 (a) Complete these sentences.

Choose from this list.

double | two more than | three more than | three times

9 (a) (i) The number of red balls is ..... the number of blue balls.

(1 mark)

9 (a) (ii) The number of yellow balls is ..... the number of blue balls.

(1 mark)

9 (b) The total number of balls in the bag is 67.

Work out the number of red balls in the bag.

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Answer .....

(4 marks)

10 Work out the value of $5x + 3y$ when $x = -2$ and $y = 6$

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Answer .....

(2 marks)

11 (a) Solve $a + 3 = 7$

.....

Answer a = ... *(1 mark)*

11 (b) Solve $2a + 5 = 1$

.....

.....

Answer a = ... *(2 marks)*

12 There are 320 people on a train.

20% are children.

One-half are men.

The rest are women.

How many women are on the train?

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Answer .....

(4 marks)

13 Here is a formula.

$$N = \frac{1}{4}xy$$

$x + y$ is less than 20.

Find **two** possible pairs of values of x and y when $N = 15$

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Answer x = ... x =.....

Answer y = ... y =.....

(3 marks)

14 (a) The numbers in this sequence go down by the same amount each time.

74 …… 58 50 42 ……

What are the **two** missing numbers?

.....

Answer ..... and ..... *(2 marks)*

14 (b) The numbers in this different sequence go down by the same amount each time.

26 …… …… …… 6

What are the **three** missing numbers?

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Answer ..... , ... , ... *(2 marks)*

15 (a) Solve $3x = 12$

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Answer x = ... *(1 mark)*

15 (b) Solve $\frac{a}{5} = -6$

.....

Answer a = ... *(1 mark)*

15 (c) Solve $5b + 4 = 19$

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Answer b = ... *(2 marks)*

15 (d) Factorise fully $4c - 20$

.....

Answer ..... *(1 mark)*

16 (a) Work out the value of $2x + 3y$ when $x = 5$ and $y = 8$

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Answer ..... *(2 marks)*

16 (b) Expand and simplify $3(2a - 4) + 5(a + 2)$

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Answer ..... *(2 marks)*

17 Peter thinks of a number. Two-thirds of the number is 60.

What is $1\frac{1}{2}$ times the number?

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Answer ..... *(3 marks)*

18 You are given that $P = x^2 - y^2$

18 (a) Show that P is a prime number when $x = 4$ and $y = 3$

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(2 marks)

18 (b) Work out **two** other pairs of values for x and y so that P is a prime number.

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Answer x = ... and y = ...

x = ... and y = ... *(3 marks)*

***19 (a) (i)** Simplify the expression $y \times 5$

Answer ..... *(1 mark)*

19 (a) (ii) Simplify fully $2x + 5y + 3x - 2y$

Answer ..... *(2 marks)*

19 (b) z represents an even number.

Explain why $(z + 1)(z - 1)$ is always odd.

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(2 marks)

20 (a) Circle **all** the prime numbers in this list.

3 6 7 9 10 13 15 17

(2 marks)

20 (b) x is a positive whole number.
$6x - 1$ is **not** a prime number. Work out a possible value for x.

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Answer ..... *(2 marks)*

There are no questions printed on this page

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TOTAL	

In the style of AQA

General Certificate of Secondary Education
Higher Tier

Mathematics 43602H

Past Paper Type Questions by Topic

Algebra

H

For this paper you must have:
- a calculator
- mathematical instruments.

Time allowed
- 1 hour

Instructions
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- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1 Solve this equation

$$\frac{x+3}{2} - \frac{x-2}{3} = 3$$

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Answer x = ... *(4 marks)*

2 Solve the equation $x^2 - 2x - 6 = 0$
Give your answers to three significant figures.

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Answer ..... *(3 marks)*

3 (a) Solve $7x = 15 - 3x$

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Answer x = ... *(2 marks)*

3 (b) $2(x + 16) + 4(x - 5)$ simplifies to $p(x + q)$

Work out the values of p and q.

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Answer p = ... , q = ... *(3 marks)*

4 Solve the simultaneous equations

$$x = 3 + 2y$$

$$x^2 + 2y^2 = 27$$

Do **not** use trial and improvement.
You **must** show your working.

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Answer ..... *(6 marks)*

5 (a) Expand $3(2a - 4)$

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Answer ..... *(1 mark)*

5 (b) Factorise $b^2 - 3b$

.....

Answer ..... *(1 mark)*

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

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Answer ..... *(2 marks)*

5 (d) Solve the equation $3(4d + 1) = 21$

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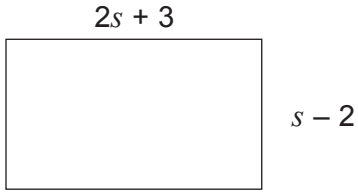
Answer d = ... *(3 marks)*

6 A rectangle has sides of $(2s + 3)$ cm and $(s - 2)$ cm.
The perimeter is 32 cm.



Not drawn accurately

Work out the value of s.

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Answer s = ... *(3 marks)*

7 Simplify fully $\dfrac{6y^2 + y - 1}{4y^2 - 1}$

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Answer ..... *(4 marks)*

8 Show that $7 + \dfrac{10}{y+2} = \dfrac{9}{y}$

simplifies to $y^2 + 15y - 18 = 0$

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(3 marks)

9 (a) Simplify $a^3b^2 \times 4ab^5$

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Answer ..... *(2 marks)*

9 (b) Factorise fully $b^2 - 8\,ab$

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Answer ..... *(2 marks)*

9 (c) Make x the subject of $s = y + \frac{x}{r}$

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Answer ..... *(2 marks)*

9 (d) Work out the least common multiple (LCM) of $6ab^2$ and $3a^2b$

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Answer ..... *(2 marks)*

10 Solve the equations

10 (a) $3y - 8 = 7 - y$

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Answer y = ... *(2 marks)*

10 (b) $\frac{y+4}{5} + \frac{y-2}{3} = 4$

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Answer y = ... *(4 marks)*

11 (a) Show that the algebraic expression

$$\frac{2y-3}{y-3}-\frac{2y-1}{2y+1}$$

Can be written as

$$\frac{2y^2+3y-6}{(y-3)(2y+1)}$$

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(4 marks)

11 (b) Hence, or otherwise, solve the equation

$$\frac{2y-3}{y-3}-\frac{2y-1}{2y+1}=1$$

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Answer ..... *(3 marks)*

12 Solve the following equations.

12 (a) $3x - 7 = x + 5$

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Answer x = ... *(2 marks)*

12 (b) $5(y - 3) = 3(y + 1)$

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Answer y = ... *(3 marks)*

12 (c) $\frac{y+1}{2} - \frac{y-3}{5} = 2$

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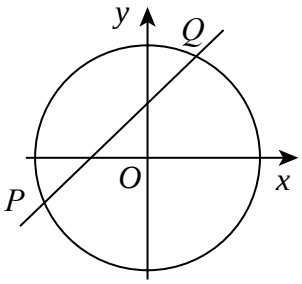
Answer y = ... *(4 marks)*

13 The circle $x^2 + y^2 = 16$ and the line $y = x + 2$ intersect at the points P and Q.



Not drawn accurately

13 (a) Show algebraically that the x-coordinates of points P and Q satisfy the equation

$$x^2 + 2x - 6 = 0$$

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(3 marks)

13 (b) Write the equation $x^2 + 2x - 6 = 0$ in the form $(x + a)^2 - b = 0$

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Answer ..... *(2 marks)*

13 (c) Hence, or otherwise, solve the equation $x^2 + 2x - 6 = 0$
Give your answers in surd form.

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Answer ..... *(2 marks)*

14 (a) Factorise $y^2 + 7y$

.....

Answer ..... *(1 mark)*

14 (b) Expand $5(3b + 8)$

.....

Answer ..... *(1 mark)*

14 (c) Expand and simplify $3(2b + 1) - 2(b - 3)$

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Answer ..... *(2 marks)*

15 Rearrange the formula $z = \dfrac{3x - 1}{2x + 5}$ to make x the subject.

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Answer ..... *(4 marks)*

***16** Solve the equation $\frac{2y-3}{4}+\frac{y-1}{3}=2$

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Answer y = ... *(5 marks)*

17 (a) Factorise $x^2 + 7x + 6$

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Answer ..... *(2 marks)*

17 (b) Hence, or otherwise, write 176 as the product of its prime factors.
Give your answer in index form.

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Answer ..... *(3 marks)*

18 Solve the simultaneous equations

$$z^2 = 2x + 29$$
$$z = x - 3$$

You **must** show your working.

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Answer ..... *(5 marks)*

✳**19** Solve $\dfrac{10}{2y-1}-\dfrac{3}{y}=3$

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Answer ..... *(6 marks)*

There are no questions printed on this page

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Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

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4–5	
6–7	
8–9	
10–11	
TOTAL	

In the style of

General Certificate of Secondary Education
Foundation Tier

Mathematics 43601F

Past Paper Questions by Topic

Bearings

F

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.

Time allowed
- 1 hour 15 minutes

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
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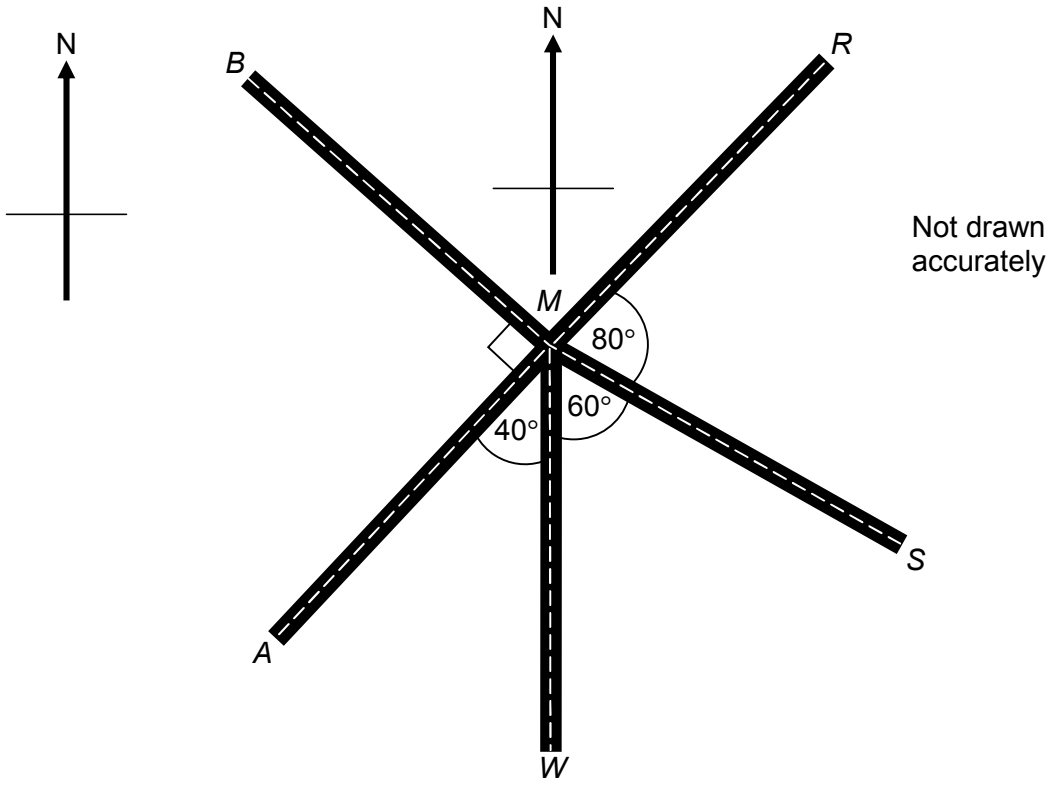
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

Advice
- In all calculations, show clearly how you work out your answer.

by Peter Bland

✳**1** Five roads meet at *M*.

W is due South of *M*.



1 (a) Is *AMR* a straight line?

Tick a box.

☐ Yes ☐ No

Show how you decide.

.....

.....

(1 mark)

1 (b)(i) What is the bearing of R from *M*?

.....

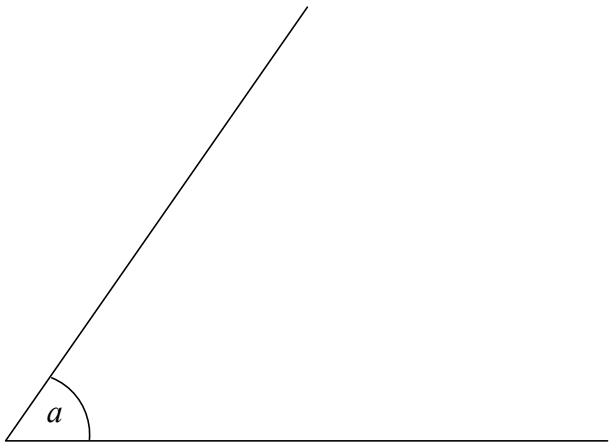
Answer ..... ° *(2 marks)*

1 (b)(ii) What is the bearing of *M* from *R*.

.....

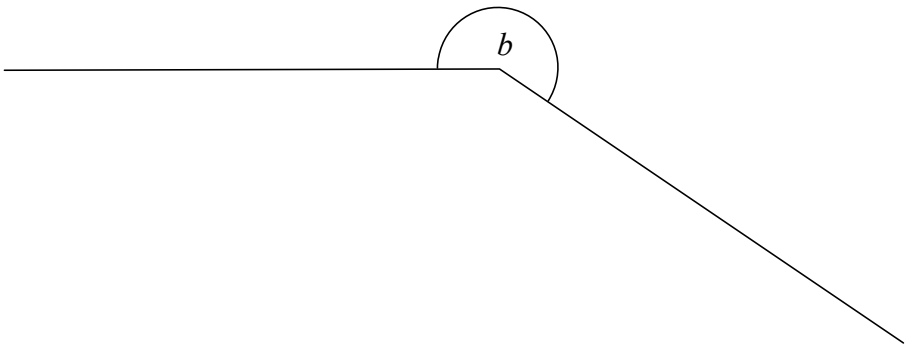
Answer ..... ° *(2 marks)*

2 (a) Measure the acute angle a.



Answer ..... degrees *(1 mark)*

2 (b) Use measurements to work out the size of angle b.



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Answer ..... degrees *(2 marks)*

2 (c) An acute angle and an obtuse angle fit together to make an angle of 200°

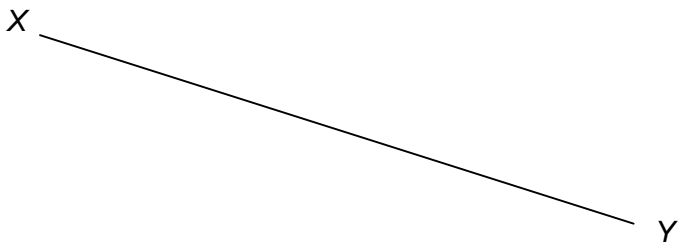
Work out two possible values for the angles

.....

Answer .....degrees and..... degrees *(2 marks)*

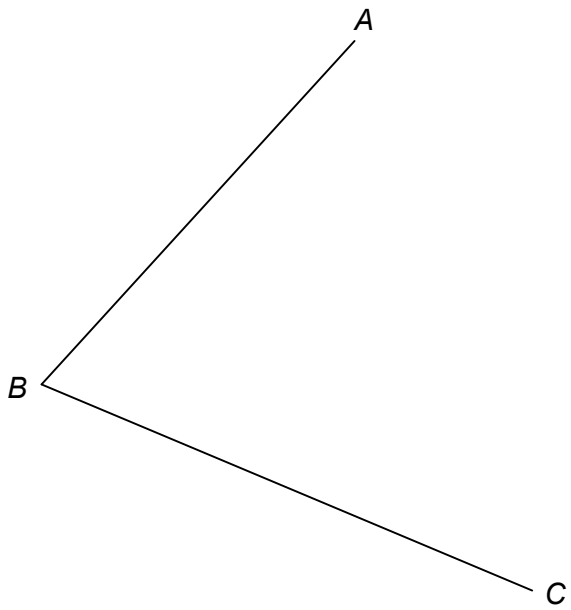
3 Use a ruler and compasses in this question.
Remember to show all construction lines and arcs clearly.

3 (a) Construct the perpendicular bisector of *XY.*



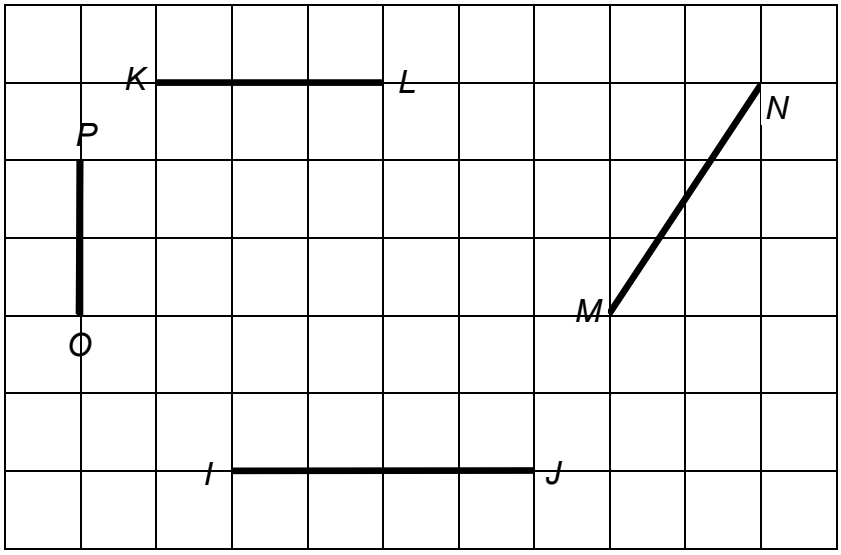
(2 marks)

3 (b) Construct the angle bisector of the angle *ABC*.



(2 marks)

4 Here are some lines drawn on a grid.



4 (a) Measure the length of *MN.*

Answer ..... cm (*1 mark*)

4 (b) Which line is parallel to *KL.*

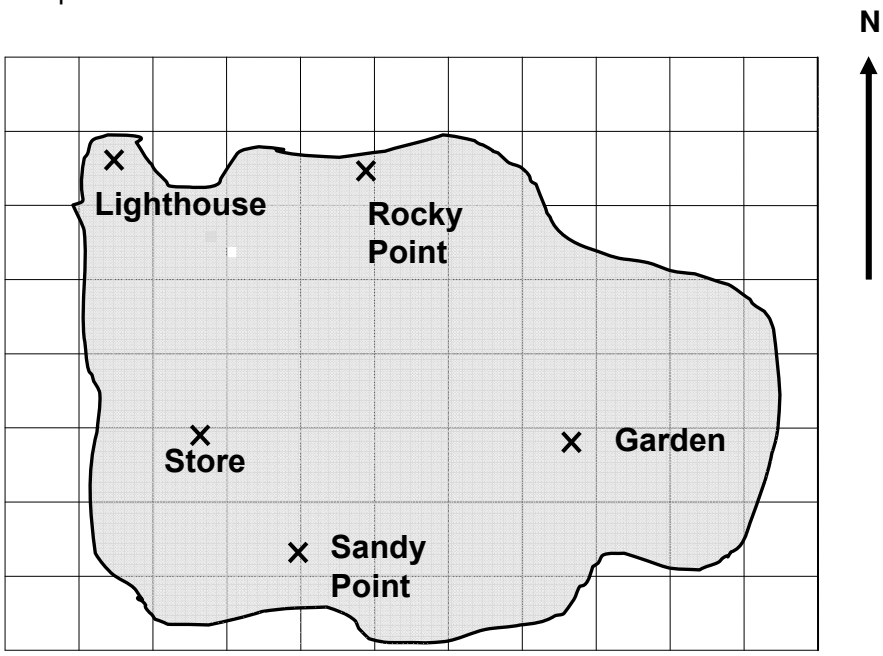
Answer ..... (*1 mark*)

4 (c) Draw a line at right angles to *IJ.*

(*1 mark*)

5 The diagram shows the map of an island drawn on a grid.

Each square represents 10 000 m².



5 (a) Estimate the area of the island.

Give your answer in square metres.

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Answer ..... m² (*4 marks*)

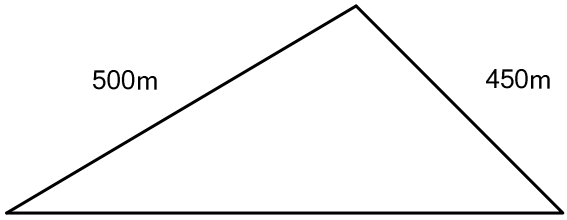
5 (b) Measure the bearing of Sandy Point from Rocky Point.

Answer ……..... (*1 mark*)

5 (c) A Football Stadium is on a bearing of 200° from Rocky Point and 070° from the Store

Mark with a cross the position of the Football Stadium on the map. (*3 marks*)

6 Here is a triangle.



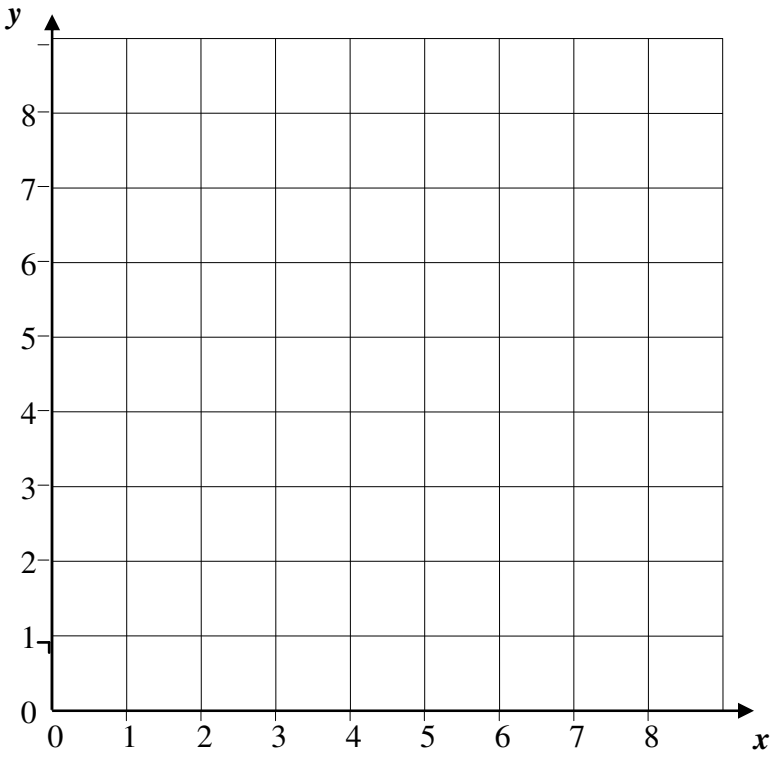
Not drawn accurately

Using ruler and compasses only, construct an accurate scale drawing of the triangle.

Use the scale 1 cm represents 50 m.

(*3 marks*)

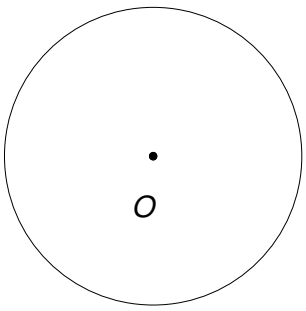
7 Here is a centimetre grid.



7 (a) On the grid, draw a circle of radius 3 centimetres with centre (5, 6).

(2 marks)

7 (b) Here is a circle, centre *O*.



7 (b)(i) Mark with a cross a point on the circumference.

(*1 mark*)

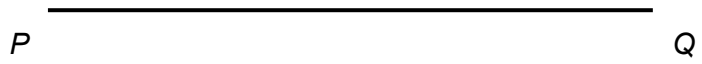
7 (b)(ii) Draw a diameter.

(*1 mark*)

7 (b)(iii) Draw a tangent.

(*1 mark*)

8 (a) Measure the length of line *PQ* in centimetres.



Answer ..... cm (*1 mark*)

8 (b) The length of line *CE* is 12 centimetres.

D is a point on *CE*.

CD is $\frac{1}{4}$ of *CE*.

Work out the length of *DE*.

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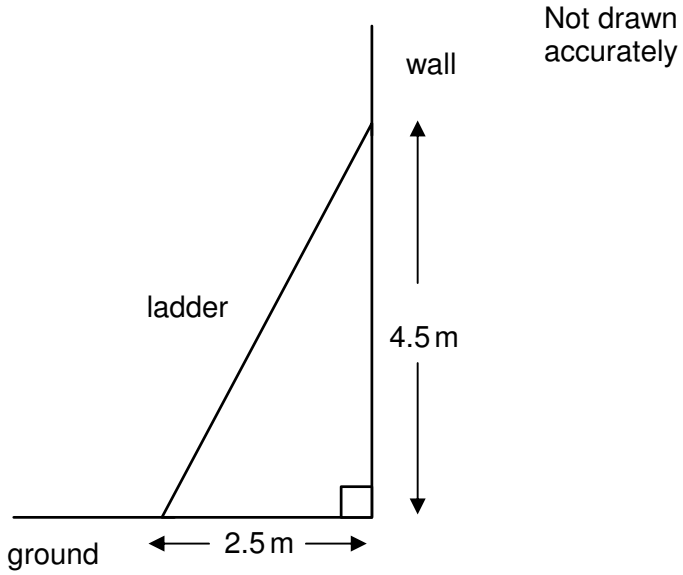
.....

Answer ..... cm (*3 marks*)

9 Sophie has put a ladder against a vertical wall.

The wall is at right angles to the ground.



9 (a) Make a scale drawing of this diagram.

The ground has been drawn for you.

Use a scale of 2 cm to represent 1 metre.

ground

(*3 marks*)

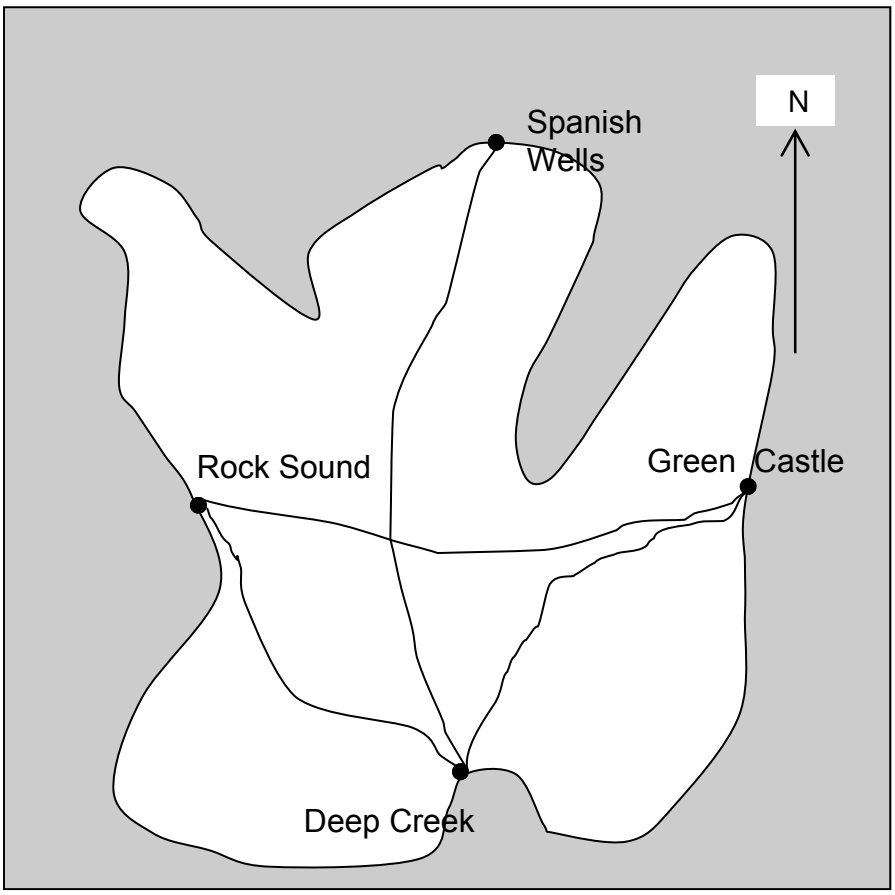
9 (b) For the ladder to be safe to use, the angle between the ladder and the ground must be between 70° and 75°

Is the ladder safe for Sophie to use?
Give a reason for your answer.

.....

(*1 mark*)

10 The diagram shows a map of an island with roads joining four towns.



10 (a) Choose the correct direction from the list to complete each sentence.

North	North-east	North-west	East
South	South-east	South-west	West

Green Castle is..... of Deep Creek.

Deep Creek is ..... of Rock Sound.

(*2 marks*)

(b) A ring is hidden on one of the roads.

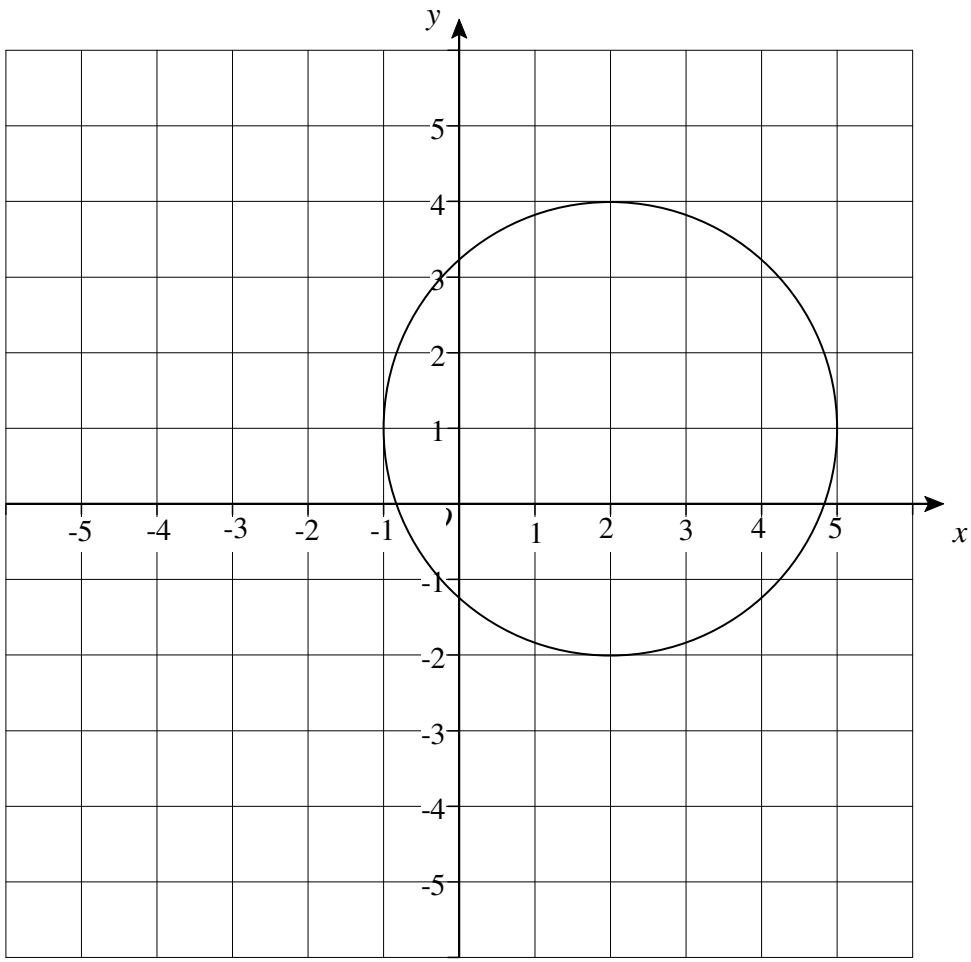
Here are some clues to find it.

The closest town to the ring is Green Castle.
The ring is twice as far from Rock Sound as from Deep Creek.

Mark with a cross, the approximate position of the ring on the map.

(*2 marks*)

11 The diagram shows a circle on a centimetre grid.



11(a) Write down the length of a diameter of the circle.

Answer ..... cm (*1 mark*)

11 (b) Write down the coordinates of the centre of the circle.

Answer (....., ...) (*2 marks*)

11 (c) Draw a tangent to the circle.

(*1 mark*)

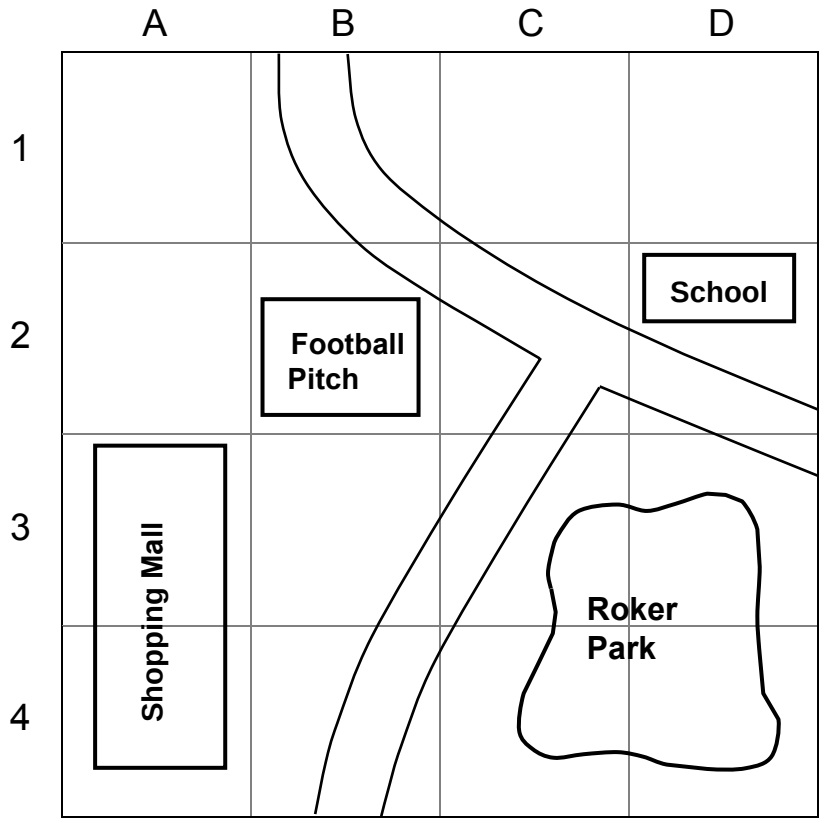
11 (d) State the units for the area of the circle.

Answer ..... (*1 mark*)

12 Part of a map is shown.

A location can be given by a letter and a number.

For example, the school is in D2.



12 (a) In which square is the football pitch?

Answer ..... *(1 mark)*

12 (b) Roker Park occupies several squares.

List all the squares.

.....

.....

Answer ..... *(2 marks)*

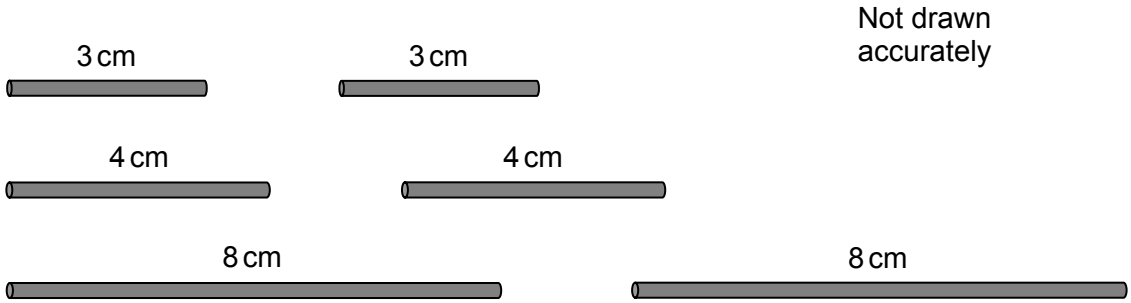
12 (c) The school is due East of the football pitch.

Complete this sentence.

The football pitch is due ..... of the school.

(1 mark)

13 Louis has 6 rods.



13 (a) He makes **two** isosceles triangles using all six of the rods.

Draw **two** different triangles that he can make using all of the rods.
Show the lengths on each side.

(2 marks)

13 (b) He tries to make a triangle using one rod of each length.
Explain why he **cannot** do this.

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Answer ..... *(1 mark)*

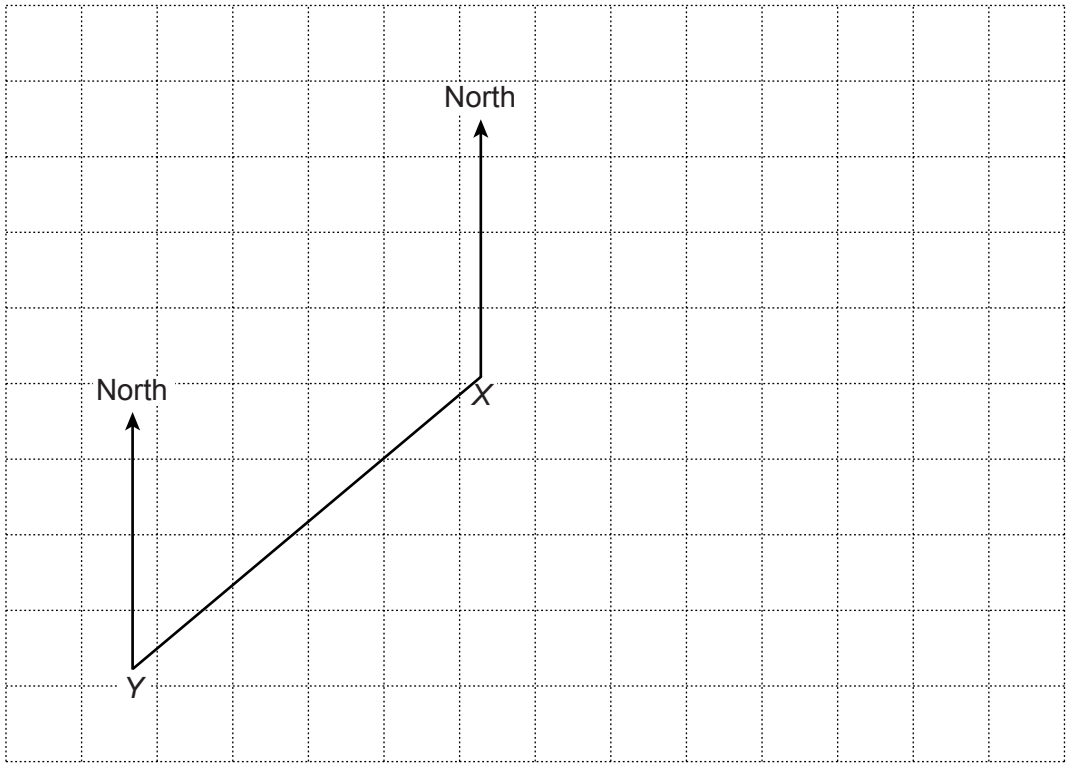
13 (c) Hassan says that it is impossible to have an isosceles triangle with a right angle.

Draw a fully labelled diagram to show that Hassan is wrong.

(2 marks)

14 A boat goes from *X* to *Y*.
The diagram shows the position of *X* and *Y*.
The diagram is drawn to scale.

Scale: 1 cm represents 50 km



14 (a) (i) Use the diagram to find the actual distance from *X* to *Y*.

.....

Answer ..... km *(1 mark)*

14 (a) (ii) Measure and write down the three figure bearing of *Y* from *X*.

Answer ..... ° *(1 mark)*

14 (b) The boat then goes to *Z*.
The bearing of *Z* from *X* is 110°
The bearing of *Z* from *Y* is 080°

Mark the position of *Z* on the diagram.

(3 marks)

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
2 – 3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
TOTAL	

In the style of AQA

General Certificate of Secondary Education
Higher Tier

Mathematics

43602H

Past Paper Type Questions by Topic

Circle Theorems

H

For this paper you must have:
- a calculator
- mathematical instruments.

Time allowed
- 1 hour

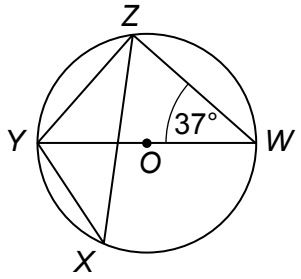
Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.

Information
- The marks for questions are shown in brackets.
- The quality of your written communication is specifically assessed in some questions . These questions are indicated with an asterisk (*)
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1 (a) *WXYZ* are points on the circumference of a circle centre *O*.
Angle *ZWY* = 37°



Not drawn accurately

Write down the value of

1 (a) (i) Angle *ZXY*

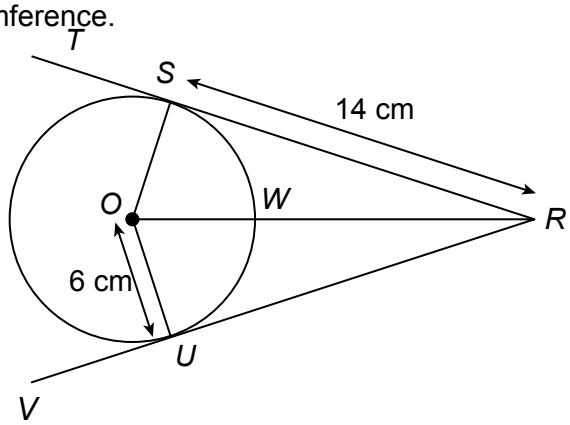
Answer ..... degrees *(1 mark)*

1 (a) (ii) Angle *WYZ*

Answer ..... degrees *(1 mark)*

1 (b) In the diagram below *RST* and *RUV* are tangents to the circle centre *O*, radius 6 cm.

The distance *RS* = 14 cm.
W is the point where *RO* meets the circumference.



Not drawn accurately

Work out the distance *RW*.

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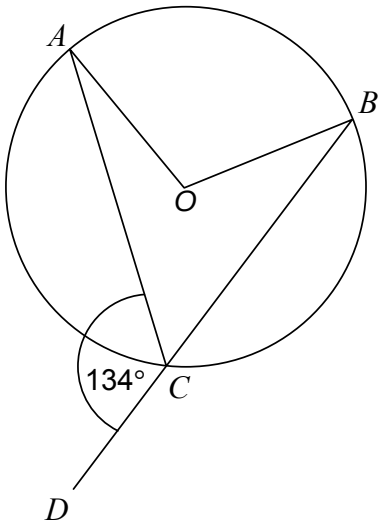
Answer ..... cm *(4 marks)*

2. O is the centre of the circle. Angle ACD = 134°

Not drawn accurately



Work out the size of the reflex angle *AOB*. You **must** show your working.

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Answer ..... degrees *(3 marks)*

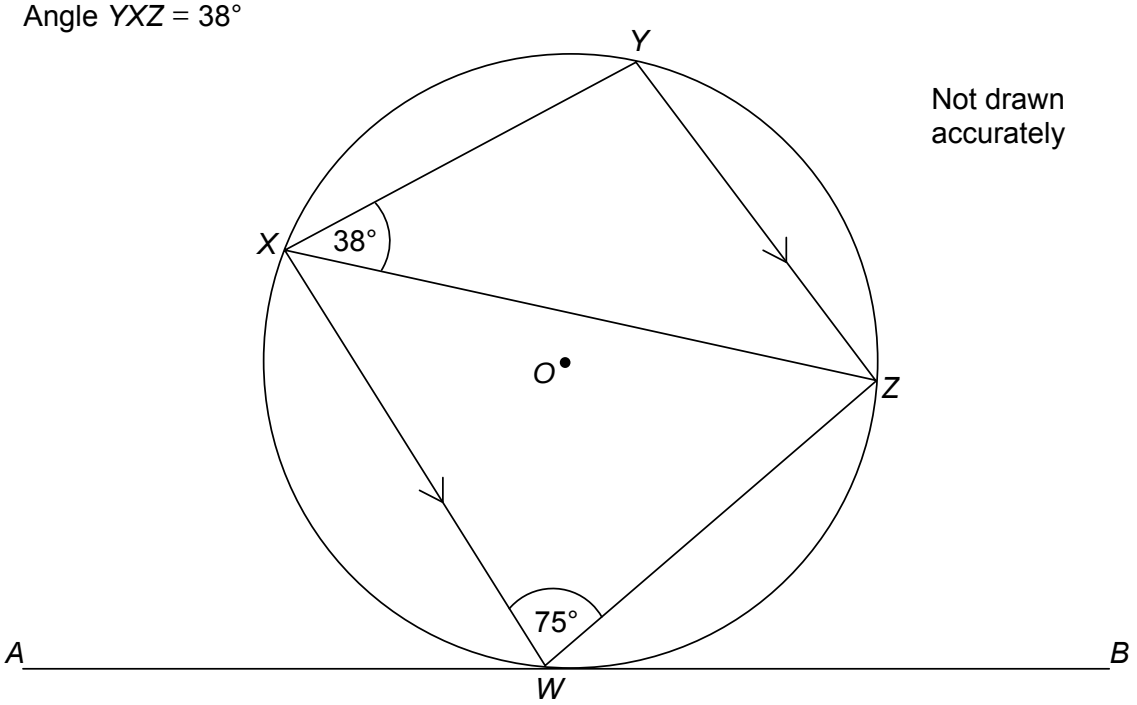
3 *WXYZ* is a cyclic quadrilateral within a circle centre *O*.

AB is the tangent to the circle at *W*.

YZ is parallel to *XW*.

Angle *XWZ* = 75°

Angle *YXZ* = 38°



3 (a) Give a reason why angle *XYZ* = 105°

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(1 mark)

3 (b) Work out the value of angle *XWA*

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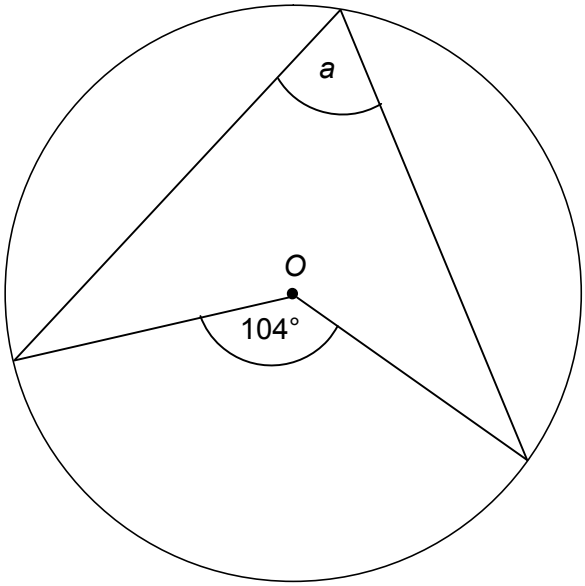
Answer ..... degrees *(3 marks)*

4 (a) Here is a circle with centre *O*.



Not drawn accurately

Write down the value of *a*.

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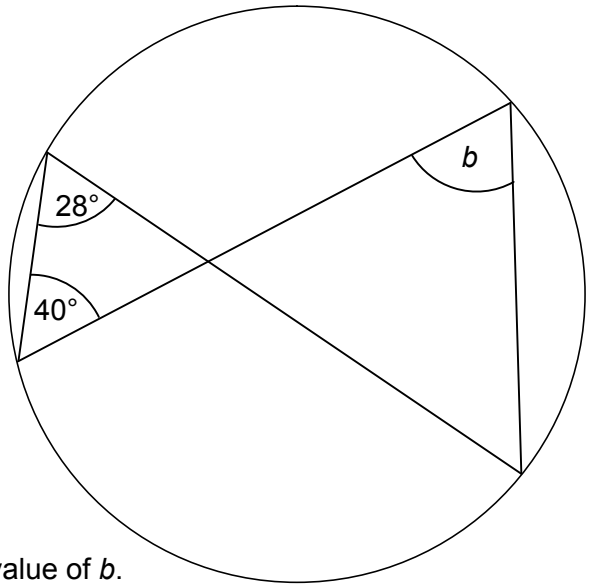
Answer ..... degrees *(1 mark)*

4 (b) Here is a different circle.



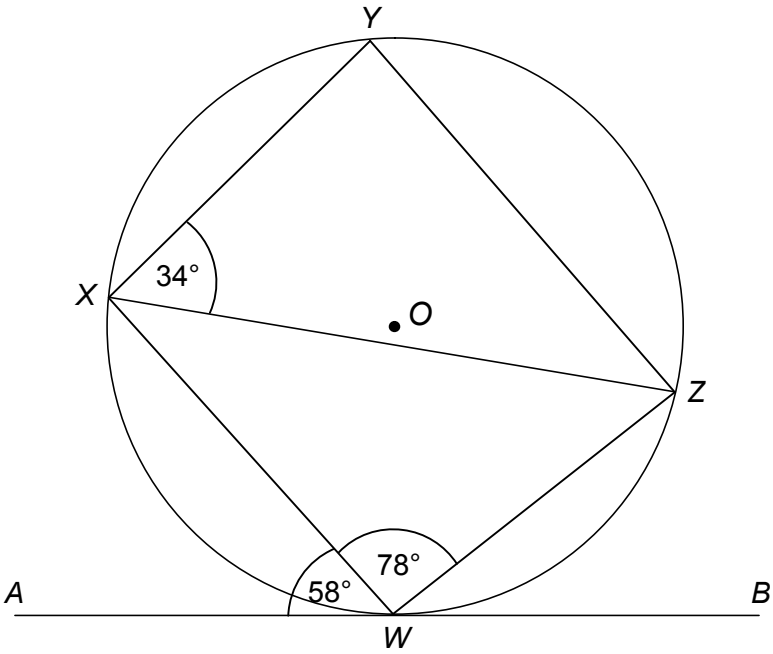
Not drawn accurately

Write down the value of *b*.

.....

Answer ..... degrees *(1 mark)*

5 *WXYZ* is a cyclic quadrilateral within a circle centre *O*.
AB is the tangent to the circle at *W*.
Angle *AWX* = 58°
Angle *XWZ* = 78°
Angle *ZXY* = 34°



Not drawn accurately

Prove that XW is parallel to *YZ*.

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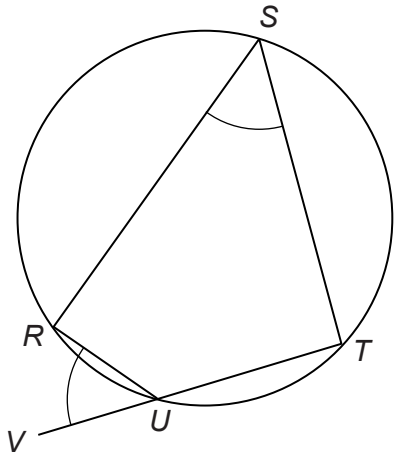
(5 marks)

6 *RSTU* are points on the circumference of a circle.

The line *TU* is extended to *V*.



Not drawn accurately

Prove that $\angle RST = \angle RUV$

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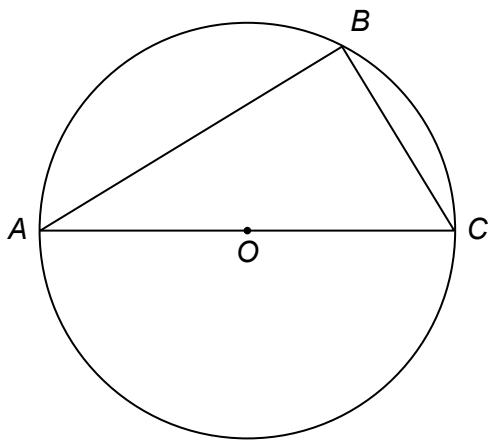
(3 marks)

7 (a) *A*, *B* and *C* are points on the circumference of a circle, centre *O*.
AC is a diameter of the circle.

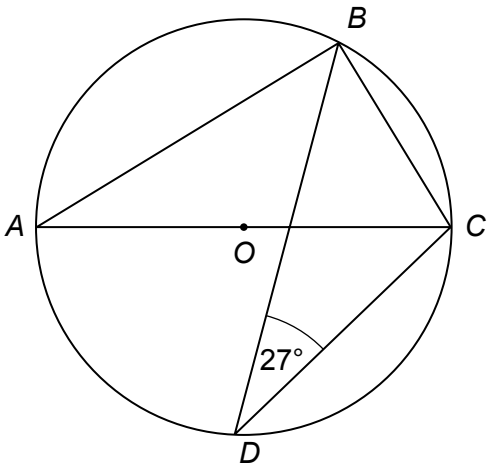


Not drawn accurately

Write down the size of angle *ABC*.

Answer ..... degrees *(1 mark)*

7 (b) *D* is also a point on the circumference of the circle in part (a).
Angle *BDC* = 27°



Not drawn accurately

7 (b) (i) Write down the size of angle *CAB*.

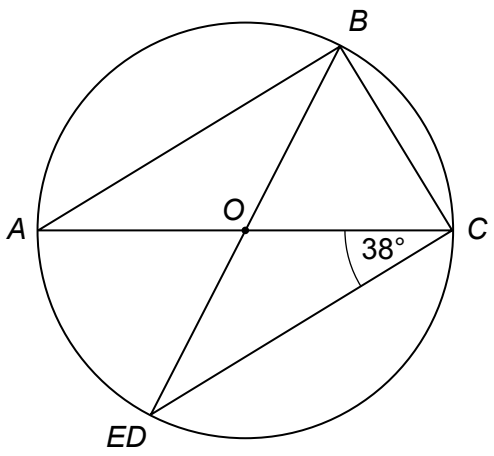
Answer ..... degrees *(1 mark)*

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

.....

Answer ..... degrees *(1 mark)*

7 (c) *D* is another point on the circumference of the circle in part (a).
BD is a diameter of the circle.
Angle *ACD* = 38°



Not drawn accurately

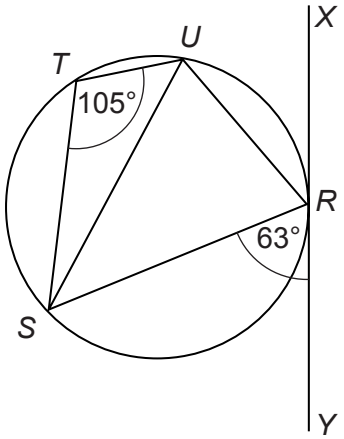
Work out the size of angle *DBC*.

.....

Answer ..... degrees *(1 mark)*

8 In the diagram, *RSTU* is a cyclic quadrilateral and *XRY* is a tangent to the circle at *R*.

Angle *UTS* = 105° and angle *SRY* = 63°.



Not drawn accurately

8 (a) Work out the size of angle *URS*.
Give a reason for your answer.

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Answer ..... degrees *(1 mark)*

Reason ..... *(1 mark)*

8 (b) Work out the size of angle *RSU*.
You **must** show your working.

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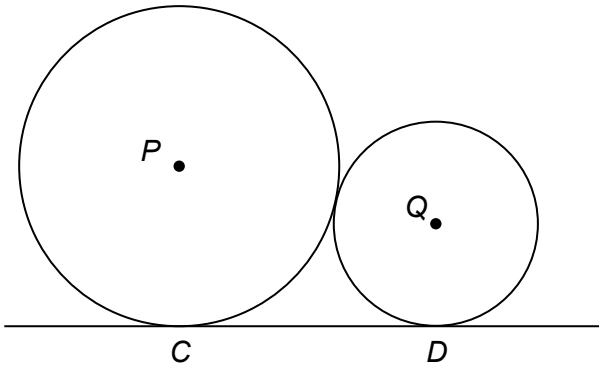
Answer ..... degrees *(2 marks)*

9 The circle, with centre *P*, has a radius of 5 cm.
The circle, with centre *Q*, has a radius of 3 cm.
The circles touch externally.
The circles have a common tangent *CD*.



Not drawn accurately

9 (a) Explain why *CDQP* is a trapezium.

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(2 marks)

9 (b) Show that *CD* = 7.75 cm to 3 significant figures.

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(3 marks)

There are no questions printed on this page

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ANSWER IN THE SPACES PROVIDED

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
TOTAL	

In the style of

AQA

General Certificate of Secondary Education
Higher Tier

Mathematics 43601H

Past Paper Questions by Topic

Cumulative Frequency

H

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.

Time allowed
- 1 hour 15 minutes

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.

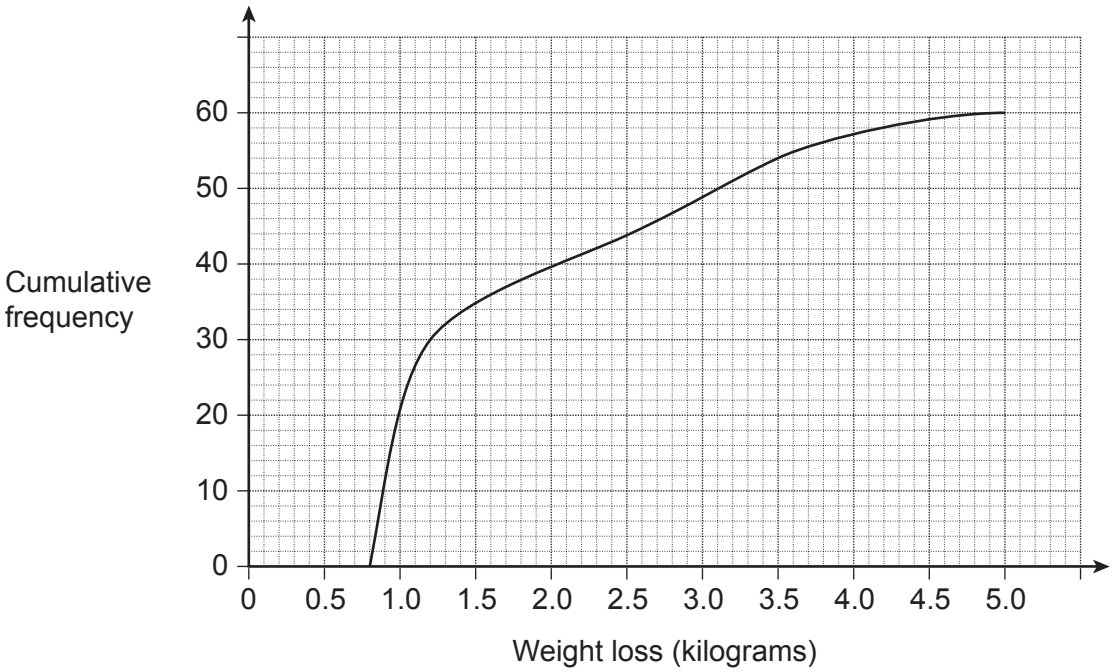
Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is.
- The quality of your written communication is specifically assessed in questions indicated with an asterisk (*)
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

***1** Two groups of people are trying to lose weight.

1 (a) Group A start running.
The graph shows information about their weight loss after one month.



1 (a) (i) How many people are in group A?

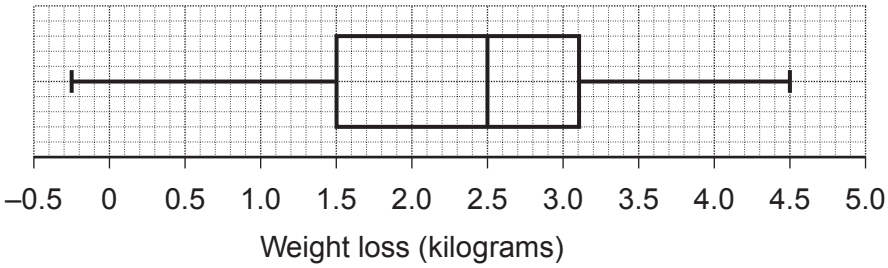
Answer ..... *(1 mark)*

1 (a) (ii) Does everyone in group A lose weight?
Write down how you decide.

.....

.....
(1 mark)

1 (b) Group B start swimming.
The box plot shows information about their weight loss after one month.



Does everyone in group B lose weight?
Write down how you decide.

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(1 mark)

1 (c) Compare the weight loss of group A with group B.

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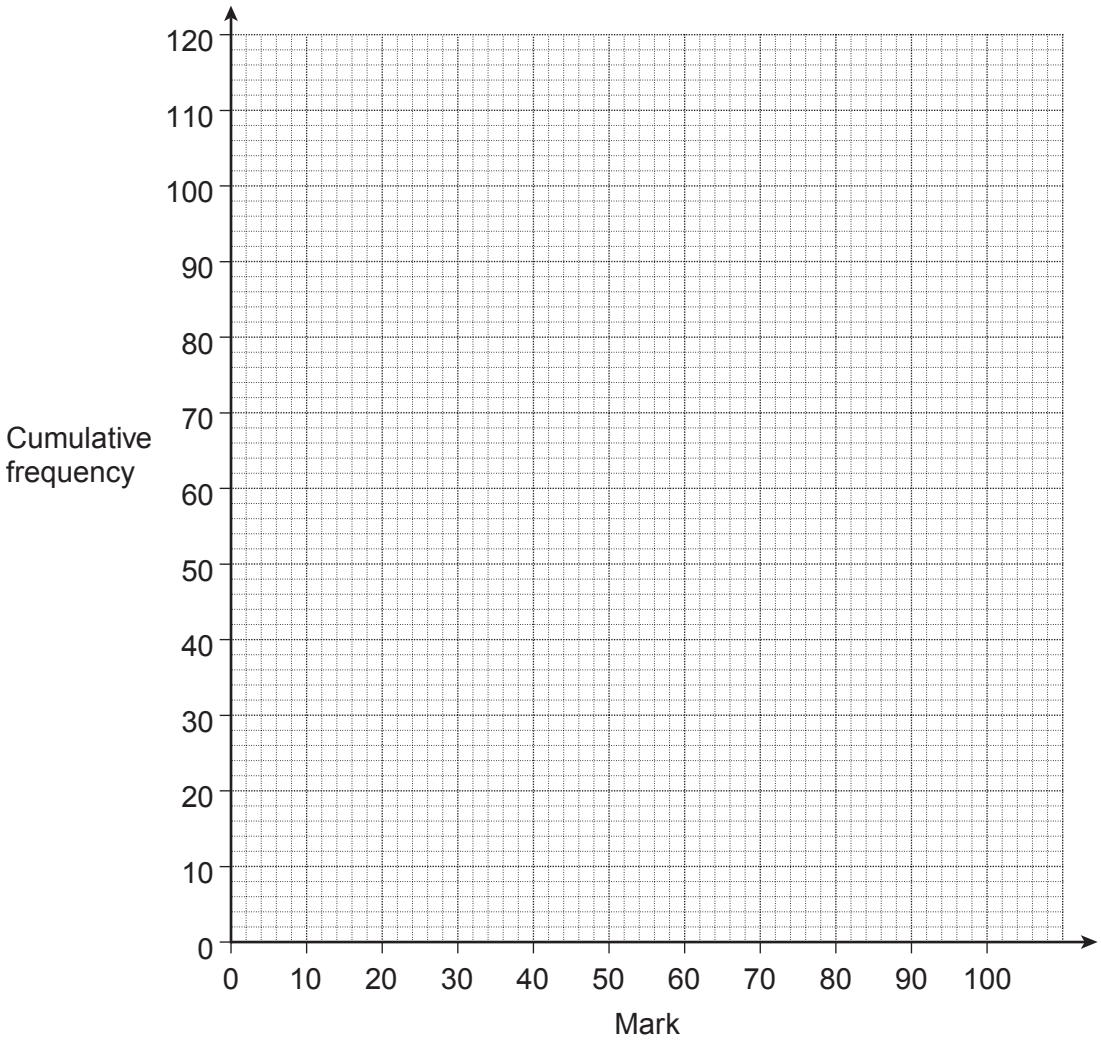
(5 marks)

2 The table shows a summary of the scores of 120 children in an examination.

Mark	Frequency
$0 < \text{mark} \leqslant 20$	8
$20 < \text{mark} \leqslant 40$	12
$40 < \text{mark} \leqslant 60$	46
$60 < \text{mark} \leqslant 80$	35
$80 < \text{mark} \leqslant 100$	19

2 (a) Three-quarters of the children pass the test.

Use a cumulative frequency graph to estimate the pass mark.



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Answer ..... *(5 marks)*

2 (b) Here is the table again.

Score	Frequency
$0 < \text{mark} \leqslant 20$	8
$20 < \text{mark} \leqslant 40$	12
$40 < \text{mark} \leqslant 60$	46
$60 < \text{mark} \leqslant 80$	35
$80 < \text{mark} \leqslant 100$	19

Two of these 120 children are chosen at random.

2(b) (i) Work out the probability that both scored **over** 60.

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Answer ..... *(2 marks)*

2(b) (ii) Work out the probability that one scored **over** 80 and the other scored 80 or **under**.

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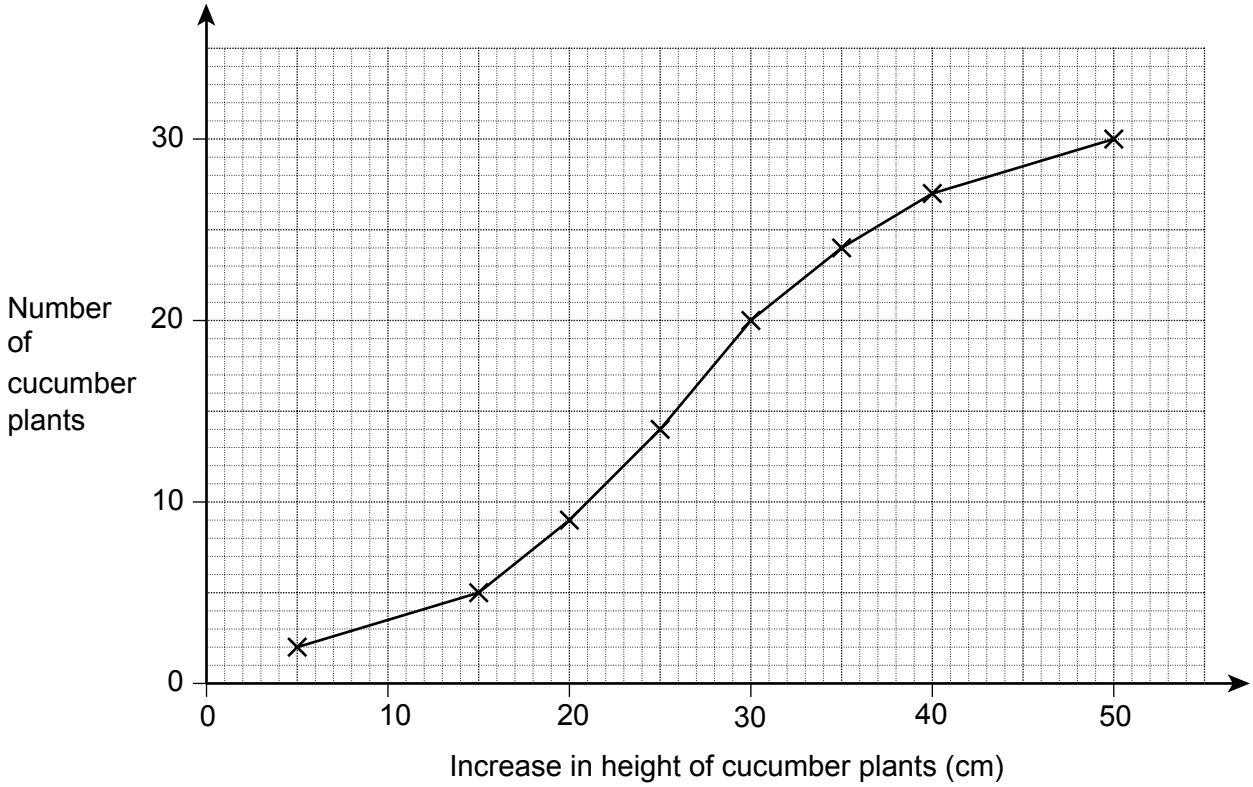
Answer ..... *(3 marks)*

3 Helen bought 60 cucumber plants and split them into two identical batches of 30 plants.
The **first** batch of 30 plants was allowed to grow naturally.
Helen measured the increase in their heights six weeks later.
The results for the **first** batch are shown on this cumulative frequency graph.



3 (a) How many cucumber plants from the **first** batch have increased in height by more than 31 cm?

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Answer ..... *(2 marks)*

3 (b) The smallest increase in height was 5 cm.
On the graph paper at the top of the next page, draw a box plot from the cumulative frequency diagram for the **first** batch of cucumber plants.

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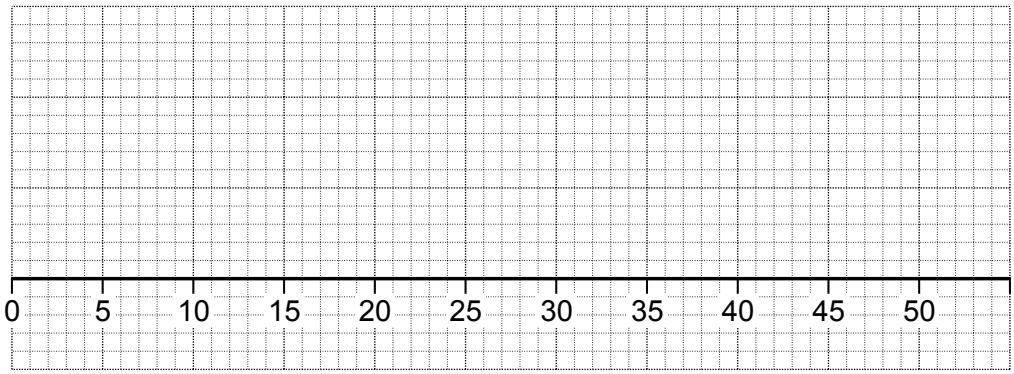
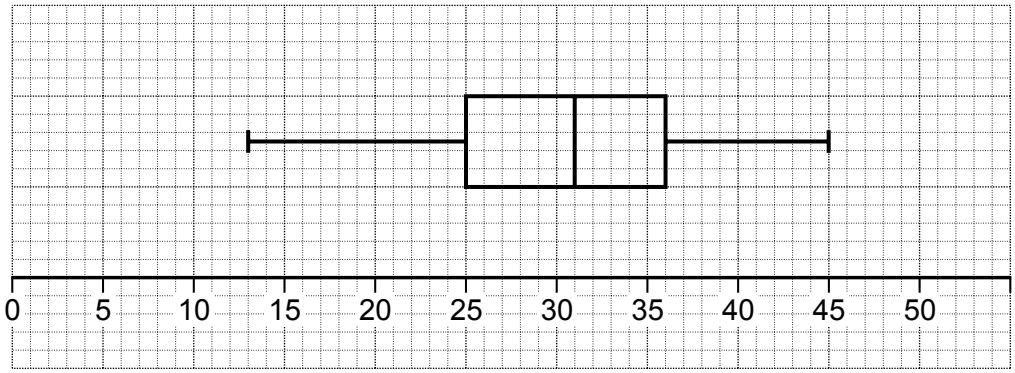


(3 marks)

The **second** batch of 30 cucumber plants was treated with *Speedygrow*.

This box plot shows the results of the **second** batch when Helen measured the increase in their heights six weeks later.



3 (c) The label on the packet of *Speedygrow* says

Use *Speedygrow* for consistent results. Make your plants bigger.

Give **two** reasons to support the claims on the packet.

Reason 1 .....

.....

.....

Reason 2 .....

.....

.....

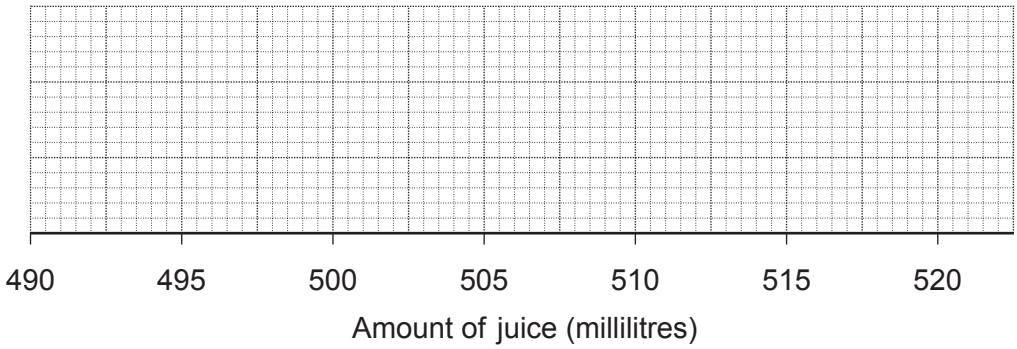
(2 marks)

4 In a factory two machines, A and B, fill bottles with juice.
Each bottle should contain 500 millilitres of juice.

4 (a) Here is some information about the amount of juice contained in a sample of bottles from machine A.

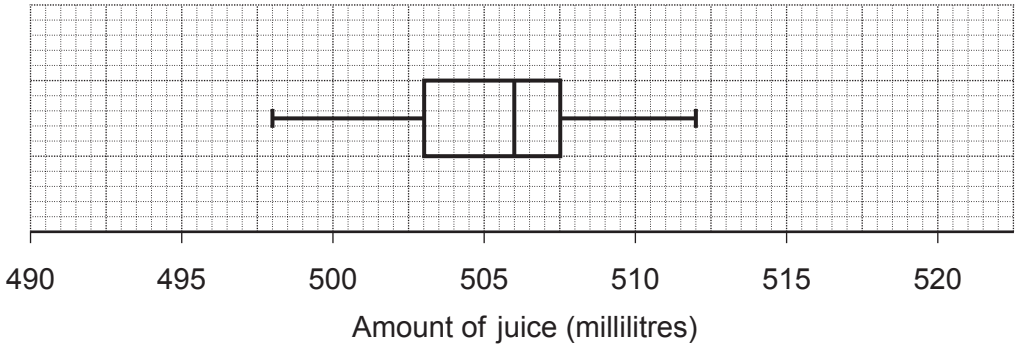
Minimum	Lower quartile	Median	Upper quartile	Maximum
496 ml	502 ml	508 ml	510 ml	514 ml

4 (a) (i) Draw a box plot to represent this information.



(2 marks)

4 (a) (ii) The box plot shows information about a sample of bottles from machine B.



Derek wants to replace one of the machines. Which machine should he replace?
Tick a box ☐ machine A ☐ machine B

Give **two** reasons for your answer.

Reason 1 .....

.....

Reason 2 .....

.....

(2 marks)

4 (b) The contents of the sample bottles are given to the nearest millilitre.

Work out the greatest possible difference between the contents of two of the sample bottles from machine A.

.....

.....

.....

Answer ..... ml *(2 marks)*

4 (c) The factory buys two more machines, C and D.
The four machines fill a total of 6000 bottles each day.

A sample, stratified by the number of bottles filled per day, is taken.
Some information about the sample is given in the table.

Machine	**A**	**B**	**C**	**D**
Number of bottles per day	1550			1800
Number in sample	31	24		

Complete the table.

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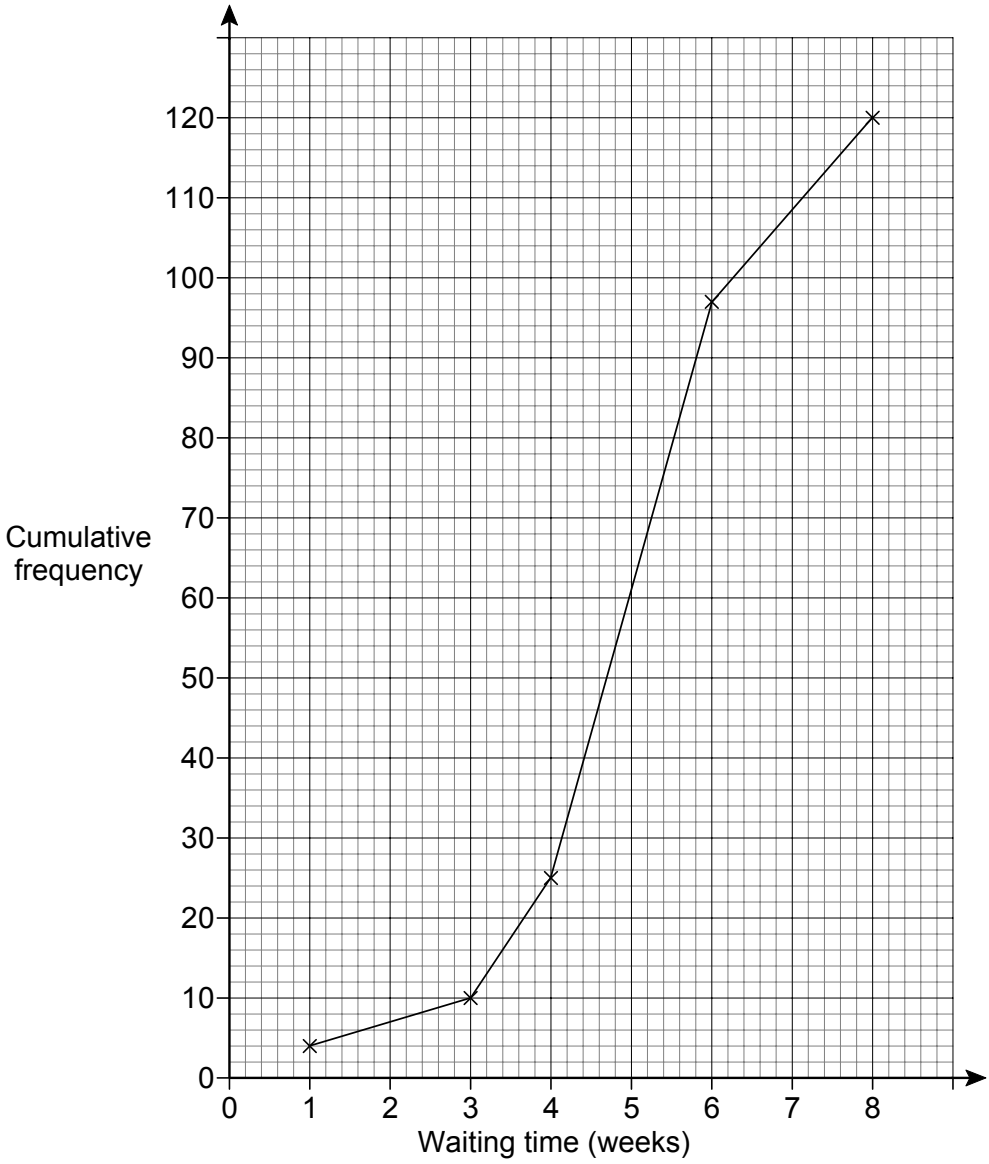
(4 marks)

5 The cumulative frequency diagram shows the waiting times for 120 learner drivers wanting to take their practical driving test.



5 (a) The test centre claims that 75% of learners wait less than 40 days for the test.

Comment on this claim.

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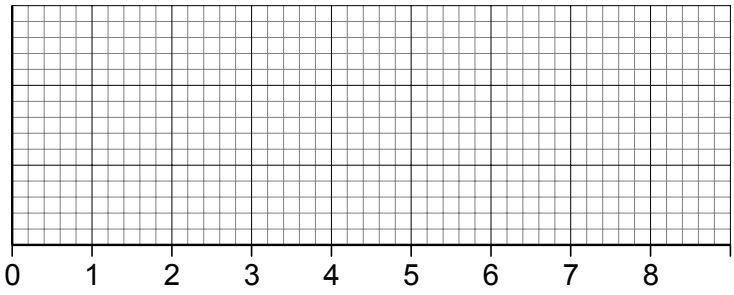
(3 marks)

5 (b) The least waiting time was 1 week.
The range of waiting times was 7 weeks.

Use this information and the cumulative frequency diagram to draw a box plot for the waiting times



(3 marks)

5 (c) At a different test centre 746 took the driving test. This table shows the age and gender of the patients.

	Age		
	Under 18	**18 – 65**	**Over 65**
Male	84	3	50
Female	39	1	37

Sheila wants the test centre to take a stratified sample of 80 patients.

Complete the table below to show how many people from each group should be sampled.

	Age		
	Under 18	**18 – 65**	**Over 65**
Male			
Female			

.....

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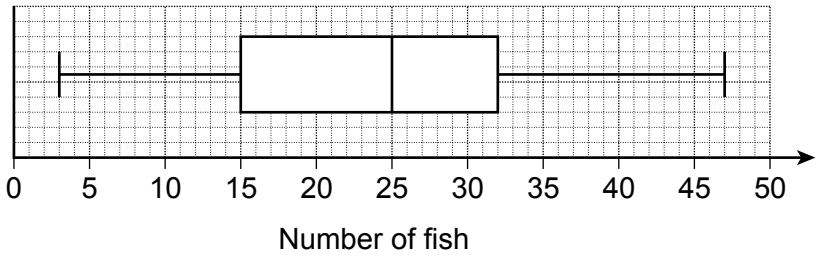
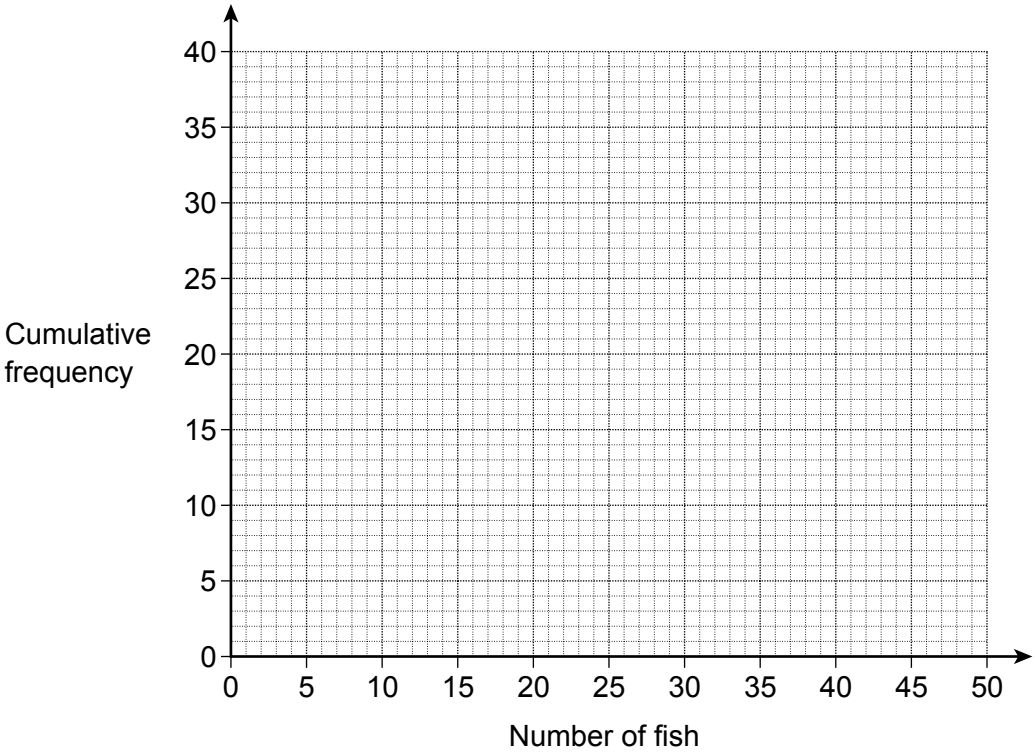
(3 marks)

6 The box plot shows the number of fish caught by forty anglers in a fishing match.
Two anglers caught the lowest number of 3





6 (a) Use the box plot to draw a cumulative frequency diagram for the numbers of fish the forty anglers caught.

(3 marks)

6 (b) What is the probability that an angler picked at random from the match caught more than 32 fish?

.....

Answer ..... *(1 mark)*

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Centre Number						Candidate Number				
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Pages	Mark
2 – 3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
TOTAL	

In the style of AQA

General Certificate of Secondary Education
Foundation Tier

Mathematics 43602F

Past Paper Type Questions by Topic

Fractions, Decimals and Percentages F

For this paper you must have:
- a calculator
- mathematical instruments.

Time allowed
- 1 hour

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is.
- The quality of your written communication is specifically assessed in some questions. These questions are indicated with an asterisk (*)
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

Advice
- In all calculations, show clearly how you work out your answer.

by Peter Bland

1. Terry owns a business that makes £3000 per month.

His profits rise by 6%.

Work out how much he now makes.

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.....

.....

Answer .....

(3)

2(a) David wins a race.

His time is recorded as 50.36 seconds.

Ron comes second in the race.

His time is three-hundredths of a second slower.

Work out Ron's time.

.....

.....

(2 marks)

2(b) Round David's time of 50.36 seconds to 1 decimal place.

.....

(1 mark)

3 Write a number in each box to make correct statements.

3 (a) $50\% = \frac{\square}{2}$

.....

(1 mark)

3 (b) $0.9 = \frac{\square}{10}$

.....

(1 mark)

3 (c) $\frac{1}{3} = \frac{\square}{6}$

.....

(1 mark)

3 (d) $\frac{3}{15} = \frac{\square}{5}$

.....

(1 mark)

✳**4** Two banks calculate the yearly interest they pay customers.

Lancashire Bank	**Cheshire Bank**
4% of the total that you invest For example: Invest £700 Interest = 4% of £700	1% of the first £300 that you invest 6% of amounts over £300 that you invest For example: Invest £700 Interest =1% of £300 + 6% of £400

Tara has £500 to invest for one year.

Work out which bank will pay her more interest. State how much **extra** interest she will earn.

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Bank .....

Extra Interest £.....

(5 marks)

5 There are 160 people on a plane. 20% are children.
One-half are men.
The rest are women.

How many women are on the plane?

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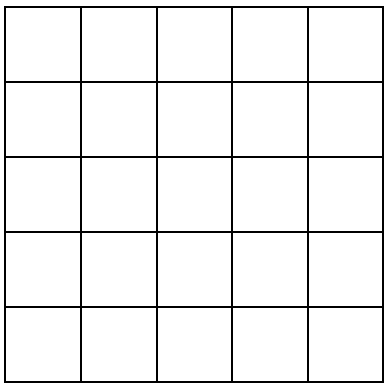
Answer .....

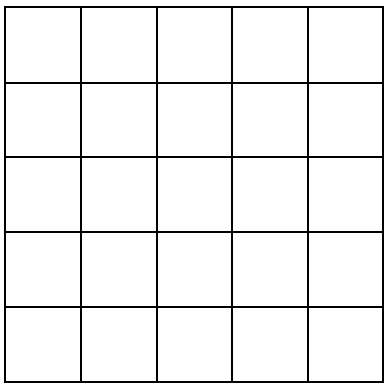
(4 marks)

6 (a) Shade $\frac{7}{25}$ of this square grid.



(1 mark)

6 (b) Shade $\frac{3}{5}$ of this square grid.



(1 mark)

6 (c) Use your answers to part (a) and part (b) to write down the answer to $\frac{3}{5} - \frac{7}{25}$

Answer .....

(1 mark)

6 (d) Work out $\frac{2}{3}$ of 27

.....

.....

Answer.....

(2 marks)

✳**6 (a)** Here are five numbers.

3 13 20 43 81

Make a fraction with a value between 3 and 4.

Use one of the numbers for the numerator and one of the numbers for the denominator.

.....

Answer .....

(2 marks)

6 (b) Which is bigger $\frac{13}{3}$ or $\frac{81}{20}$?

You **must** show your working.

.....

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.....

Answer .....

(3 marks)

7 (a) Work out $\frac{1}{4} + \frac{1}{3}$

You may use this grid to help you.

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Answer .....

(2 marks)

7 (b) There are 24 people in a bus.
One-third of them are men who wear glasses.
One-quarter of them are women.
How many men do not wear glasses?

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Answer .....

(2 marks)

✳**8** Helen is going on holiday to Spain.

8 (a) She changes £2000 into Euros.
The exchange rate is £1 = 1.17 Euros

How many Euros does she receive?

.....

.....

Answer ..... Euros *(2 marks)*

8 (b) In Spain, she changes an extra £100 into Euros.
The exchange rate is 1 Euro = £0.80

How many Euros does she receive?

.....

.....

Answer ..... Euros *(2 marks)*

8 (c) Helen is on holiday for one week.
She wants to hire a car for **at least** 5 days.
Three car hire firms advertise their charges.

	Fixed amount (Euros)	**Additional cost per day (Euros)**
Eurodrive	100	14
Coolcar	60	20
Zedcars	0	35

Work out the cheapest firm for Helen for different numbers of days of car hire. Show full details of your working and conclusions.

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(6 marks)

9 Work out $8^2 \div 4^3$

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Answer ..... *(2 marks)*

10 You are given that $32.7 \times 26 = 850.2$

10 (a) Write down the value of 327×26

.....

Answer ..... *(1 mark)*

10 (b) Write down the value of $85.02 \div 26$

.....

Answer ..... *(1 mark)*

10 (c) Work out the value of 32.7×27

.....

.....

.....

Answer ..... *(2 marks)*

11 Two adults and 18 children go to the circus.
The cost of a child ticket is half of the cost of an adult ticket. The total cost of the tickets is £132.

Work out the cost of one child ticket.

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Answer £ ..... *(3 marks)*

12 What fraction is half way between $\frac{1}{4}$ and $\frac{1}{8}$?

Give your answer as a fraction in its simplest form.

.....

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Answer ..... *(3 marks)*

13 Divide £600 in the ratio 9 : 6 : 5

.....

.....

.....

.....

Answer £ ..... : £ ..... : £ ..... *(3 marks)*

***14** Sophie sells jars of honey in her shop.
She has 80 jars to sell at £3 each.
She sells 50 jars and then reduces the price by 40%. Sophie then sells the remaining jars at the reduced price.

It costs her £95 to get the jars of honey.
Her target is to make a profit of at least £100.

Does she meet her target?
You **must** show your working.

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(5 marks)

15 (a) (i) Write $\frac{1}{4}$ as a percentage.

Answer ..... % *(1 mark)*

15 (a) (ii) Write 30% as a decimal.

Answer ..... *(1 mark)*

15 (a) (iii) Write $\frac{1}{4}$, 30% and 0.2 in order with the smallest first.

.....

.....

Answer ..... *(1 mark)*

15 (b) Complete the following.

15 (b) (i) $\frac{2}{3} = \frac{\square}{18}$

(1 mark)

15 (b) (ii) $\frac{\square}{4} = \frac{15}{20}$

(1 mark)

15 (c) Work out $\frac{3}{8}$ as a decimal.

.....

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Answer ..... *(2 marks)*

16 (a) Work out the difference between

10% of 350 and $\frac{1}{2}$ of 76

.....

.....

.....

Answer .....

(3 marks)

16 (b) Write in order of size:

$\frac{1}{4}$ 0.205 0.2

Start with the smallest.

You **must** show your working.

.....

.....

Smallest .....

.....

Largest .....

(*2 marks*)

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Centre Number						Candidate Number				
Surname										
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Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
TOTAL	

In the style of

AQA

General Certificate of Secondary Education
Foundation Tier

Mathematics 43601F

Past Paper Questions by Topic

Frequency

F

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.

Time allowed
- 1 hour 15 minutes

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
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Information
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- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1 (a) Basil records the types of fish that he caught during his holiday in The Bahamas.

(i) Complete the table.

Type of fish	Tally	Frequency
Mutton Fish	IIII	
Grouper	III	
Jack	~~IIII~~ ~~IIII~~ II	
Schoolmaster	~~IIII~~ IIII	
	Total	

(3)

(ii) What fraction of the fish are Mutton Fish?
Give your answer in its simplest form.

.....

(2)

1 (b) This table shows the types of fish that Peter caught during the holiday.

Type of fish	Mutton Fish	Grouper	Jack	Schoolmaster
Frequency	4	6	5	3

He has finished the first row of a pictogram to show the results. Complete the key and pictogram.

Key:  represents ..... fish

Mutton Fish	
Grouper	
Jack	
Schoolmaster	

(4)

1 (c) 500 000 people record the types of birds in their gardens. In total, they record eight million birds. On average, how many birds does each person record?

.....

(3)

1 (d) Here is a list of the birds at a bird table.

robin	robin	sparrow	blackbird	starling
blackbird	starling	blackbird	robin	blackbird

One bird flies away. Another bird arrives at the bird table.
The new mode is robin.

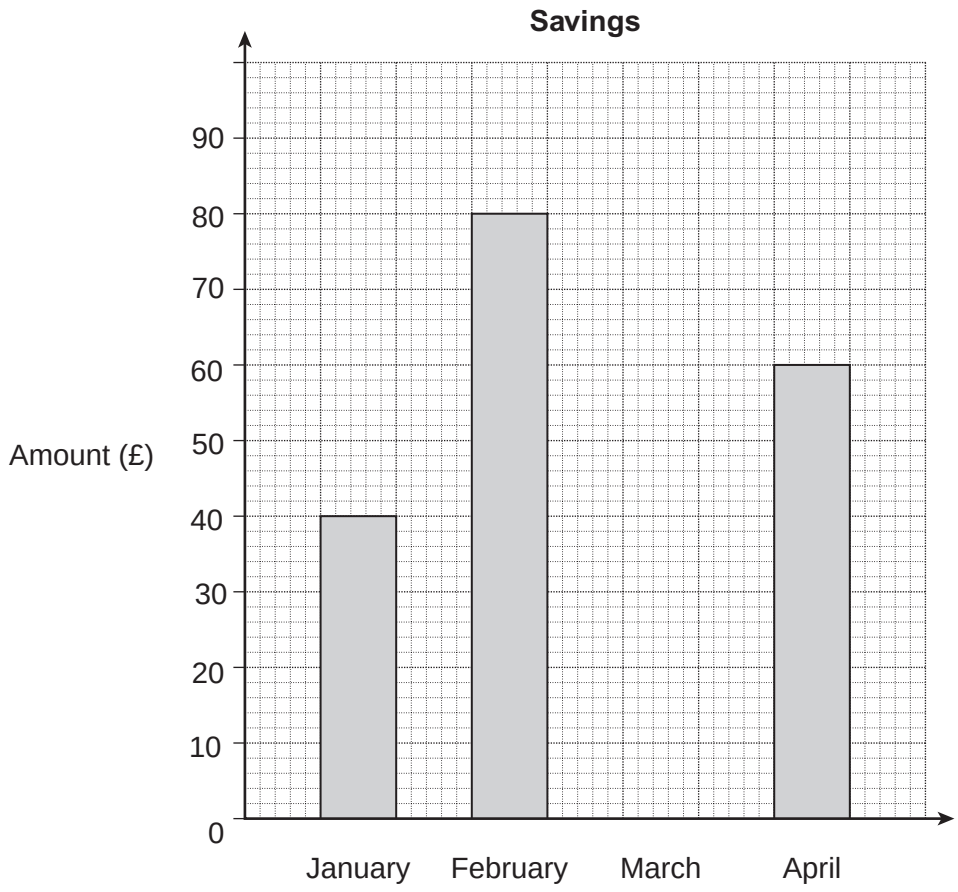
What type of bird flies away and what type of bird arrives? Complete the table.

	Type of bird
Flies away	
Arrives	

(2)

(Total 14 marks)

2 (a) The bar chart shows the amounts Louis saves in January, February and April 2012.



2 (a) (i) How much does he save in January 2012?

Answer £ ..... *(1 mark)*

2 (a) (ii) From January to April he saves £250 in total.

Complete the bar chart by drawing the bar for March.

.....

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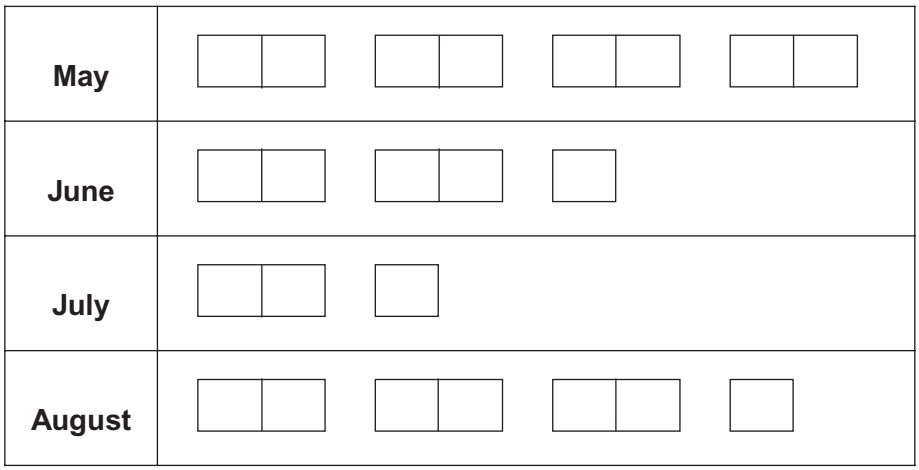
(3 marks)

2 (b) The pictogram shows the amounts Louis saves in the next four months.

Key:  represents £20



Work out the range of the amount he saves in these four months.
You **must** show your working.

.....

.....

Answer £ ..... *(2 marks)*

2 (c) (i) For the rest of 2012 Louis saves £50 each month.

How much does he save in 2012 in total?

.....

.....

.....

.....

Answer £ ..... *(3 marks)*

2 (c) (ii) Louis spends 50% of these total savings to pay for a holiday.

How much does he pay for the holiday?

.....

.....

Answer £ ..... *(2 marks)*

3 Is money discrete or continuous?
Tick a box.

☐ Discrete ☐ Continuous

Give a reason for your answer.

.....

.....

(1 mark)

***4** A company pays people to visit shops as a mystery shopper.
Peter works for this company.
His fees in September are shown.

Fee (£)	Frequency
8	10
10	18
12	7
15	4
20	1

4 (a) Calculate his mean fee.

.....

.....

.....

Answer £ ..... *(3 marks)*

4 (b) Peter says that his modal fee and his median fee are both £10. Is he correct?
Give reasons and working to show how you decide.

.....

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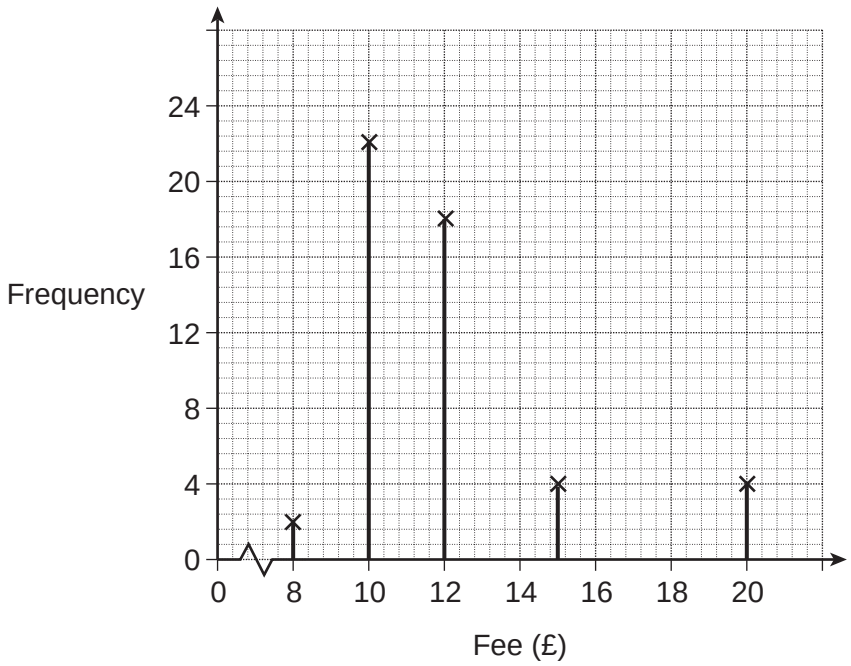
.....

.....

(2 marks)

4 (c) Sheila also works for this company.
Her fees in the same month are shown.

Sheila's fees



Give **one** similarity and **one** difference in the fees of Peter and Sheila.

Similarity .....

.....

Difference .....

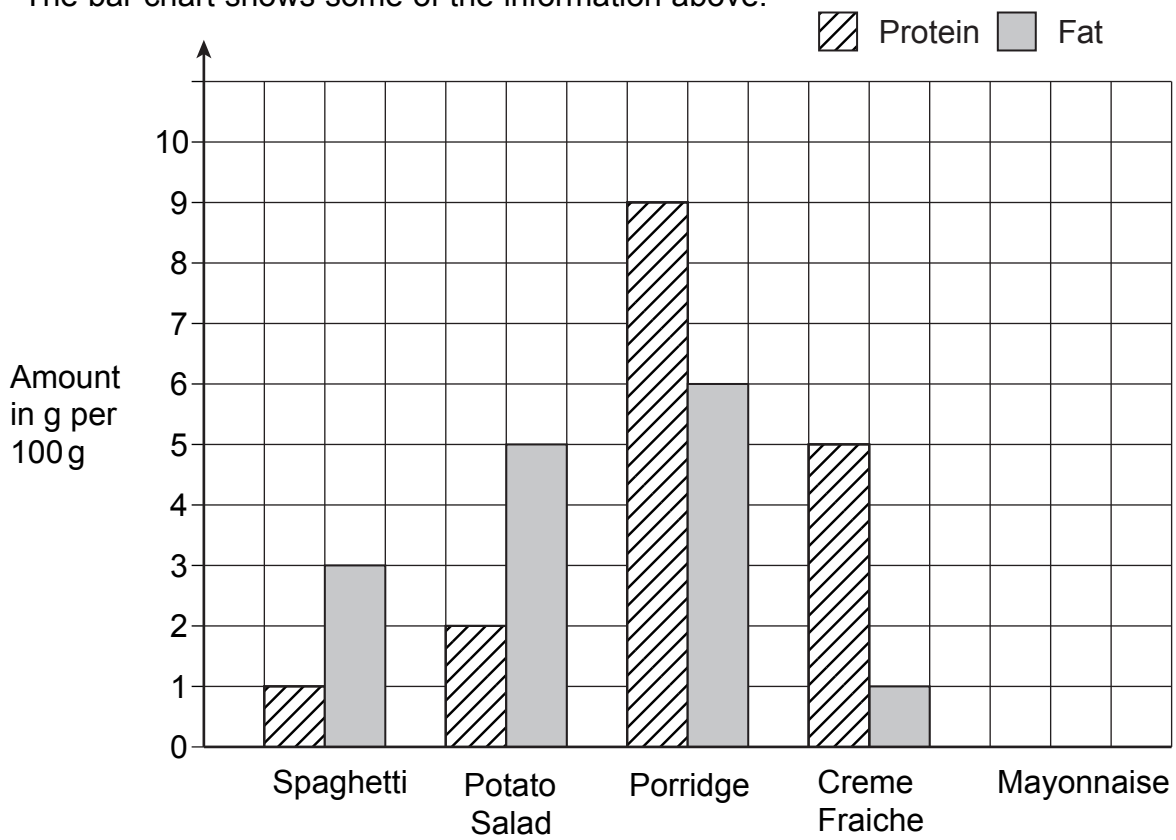
.....

(2 marks)

5 Marie is collecting data to show how much protein and fat are in some food products. The table shows her results.

Product	Spaghetti	Potato Salad	Porridge	Creme Fraiche	Mayonnaise
Amount of protein per 100 g	1g	2g	9g	5g	1g
Amount of fat per 100 g	3g	5g	6g	1g	10g

The bar chart shows some of the information above.



5 (a) Complete the bar chart for the Mayonnaise.

(2 marks)

5 (b) Which product has the most protein per 100 g?

Answer ..... *(1 mark)*

5 (c) Which product has $2\frac{1}{2}$ times more fat than protein?
Explain your answer.

.....

.....

(1 mark)

The table shows the weather in Birmingham each day for 40 days.

6 (a)

Weather	Tally	Frequency
Sun	卌 卌	
Rain	卌 卌 卌 III	
Snow	IIII	
Fog	卌 III	
		Total = 40

Complete the table.

(2 marks)

6 (b) What fraction of the 40 days are sunny?
Give your answer in its simplest form.

.....

Answer ..... *(2 marks)*

6 (c) In Glasgow for the 40 days

- 16 days are sunny
- 50% of the days have rain
- there is no snow.

6 (c) (i) Complete the table for Glasgow.

Weather	Frequency
Sun	
Rain	
Snow	
Fog	
	Total = 40

(3 marks)

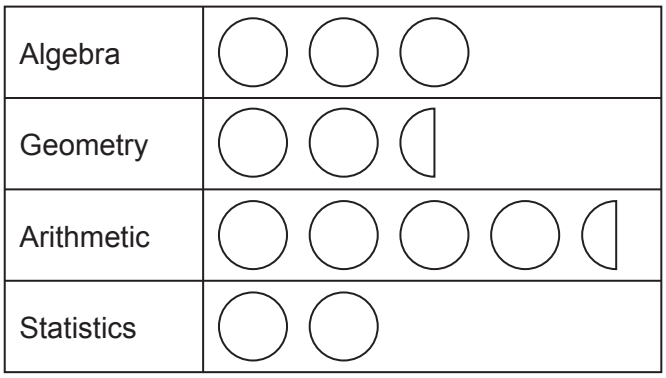
6 (c) (ii) One of the 40 days in Glasgow is chosen at random. Use a suitable probability **word** to complete the sentences.

The chance of choosing a day with snow is.....

The chance of choosing a day with rain is .....

(2 marks)

* 7 David takes four Mathematics tests.
The pictogram shows his scores.



7 **(a)** David scores 60% in Algebra.

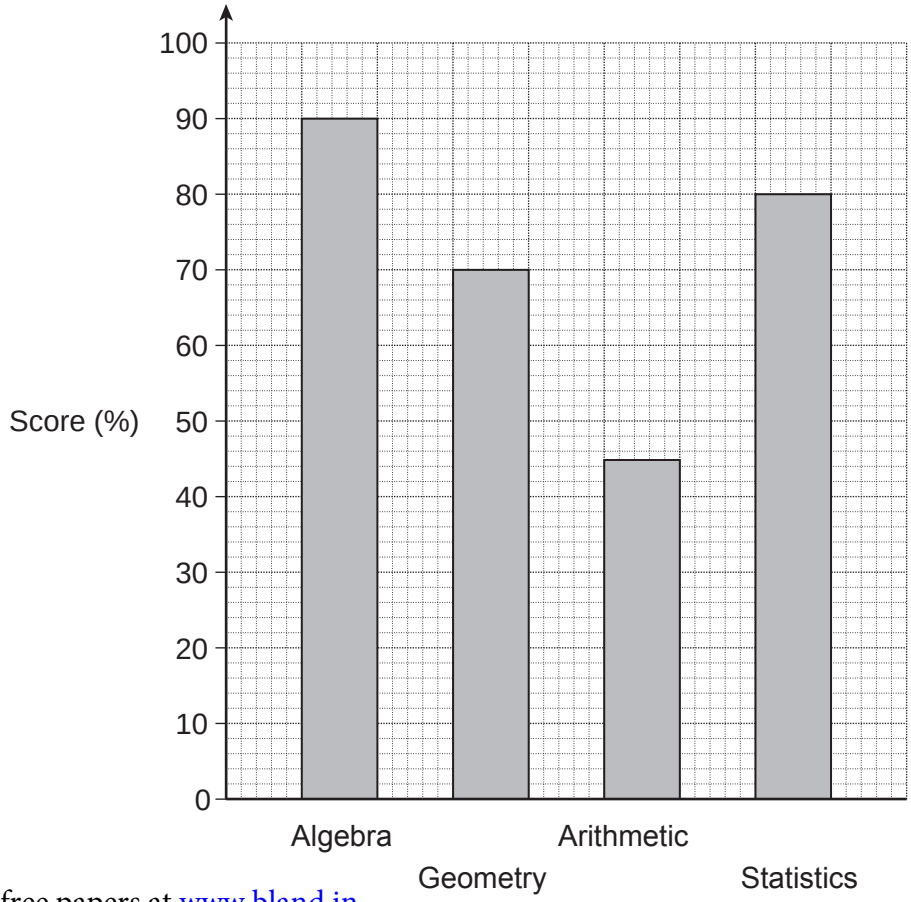
Complete the key. Key: ◯ represents ……%

(1 mark)

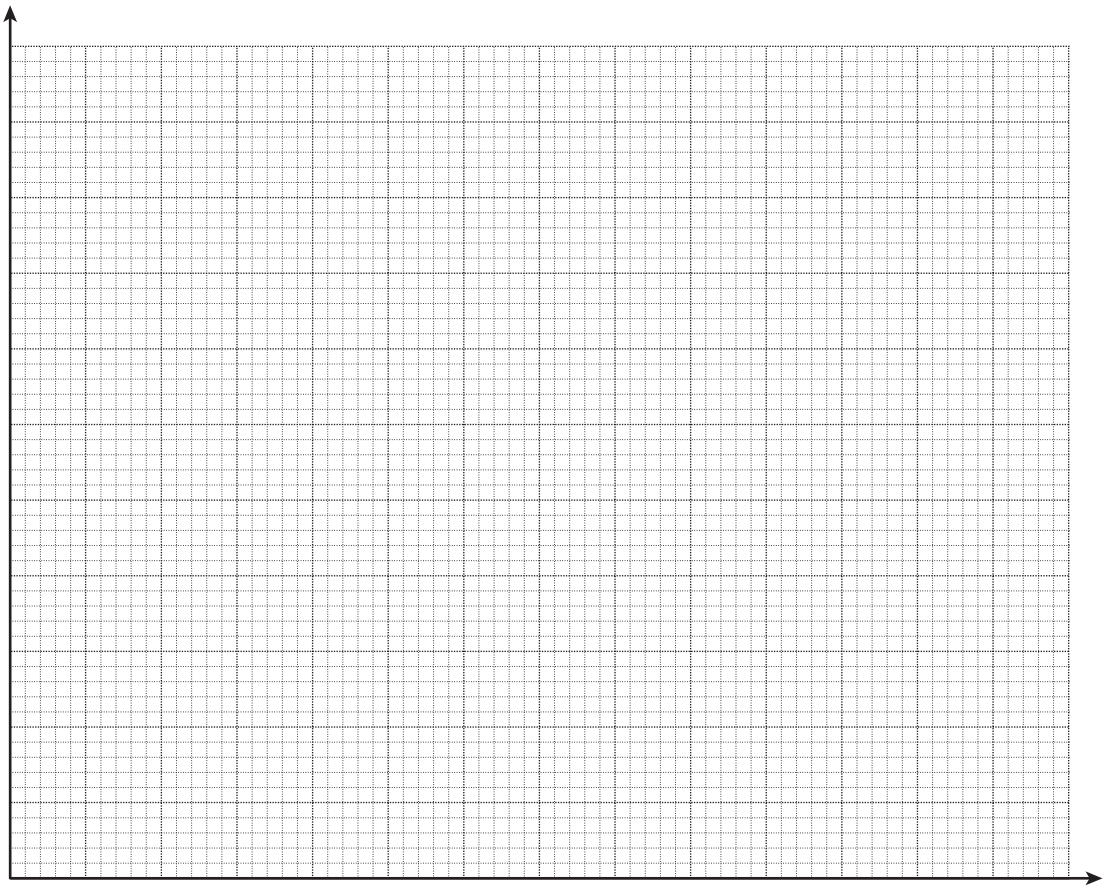
7 **(b)** In which subject is his highest score?

Answer ..... *(1 mark)*

7 **(c)** Helen takes the same four tests.
The bar chart shows her scores.



7 **(c) (i)** David wants to compare his scores with Helen's scores. Draw a suitable diagram that he can use.



(4 marks)

7 **(c) (ii)** Write down **three** facts comparing their scores.

Fact 1 .....

.....

Fact 2 .....

.....

Fact 3 .....

.....

(3 marks)

8 A company makes boxes of matches.

The company checks that the boxes contain 50 matches.

8 (a) The number of matches in a sample of 11 boxes is

51 50 51 51 52 43 50 50 51 51 50

8 (a) (i) Write down the mode.

Answer ..... *(1 mark)*

8 (a) (ii) Work out the median.
You **must** show your working.

.....

.....

Answer ..... *(2 marks)*

8 (a) (iii) Work out the mean.

.....

.....

Answer ..... *(3 marks)*

8 (b) The company claims there are 50 matches in a box.

8 (b) (i) Give a reason why this claim seems fair.

.....

.....
(1 mark)

8 (b) (ii) Give a reason why this claim seems unfair.

.....

.....
(1 mark)

8 **(c)** The company uses the first 11 boxes produced each Monday to check the contents. State **two** ways this method of sampling can be improved.

1 .....

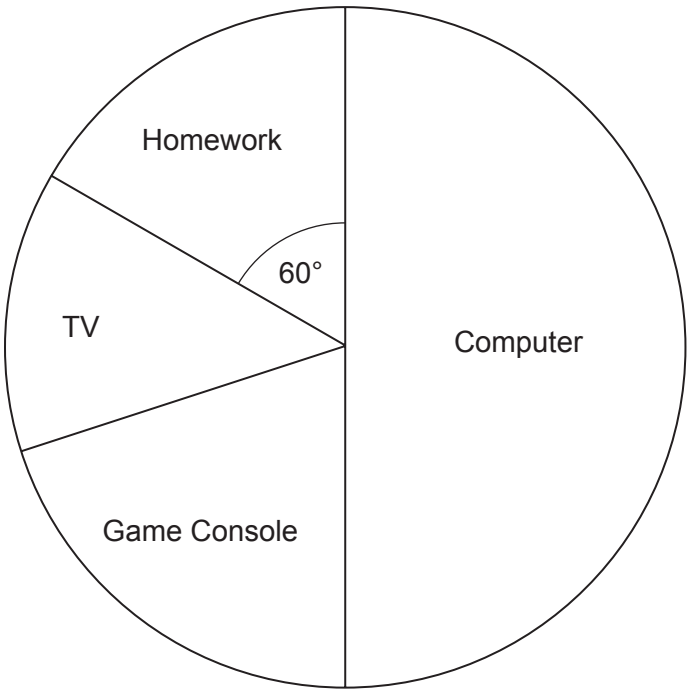
.....

2 .....

.....

(2 marks)

9 The pie chart shows the activities of 60 students after school finished one day.



9 (a) How many students go on their computer?

.....

Answer ..... *(1 mark)*

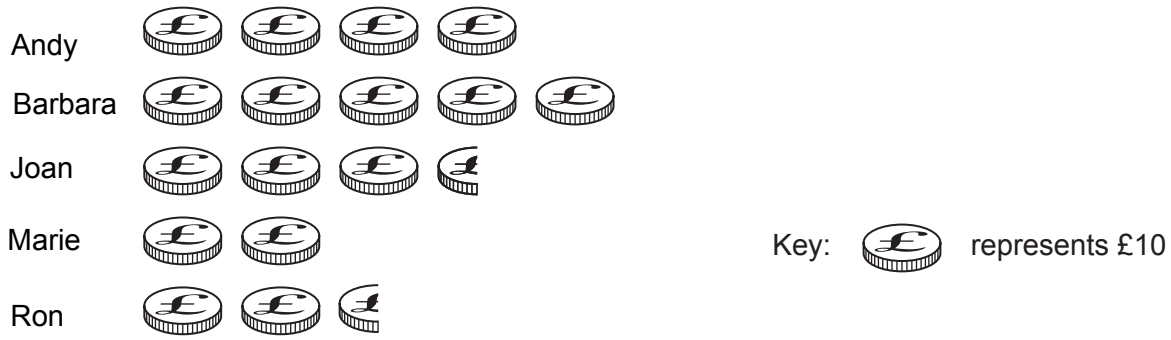
9 (b) How many students watch TV or play on their game console?

.....

.....

Answer ..... *(3 marks)*

10 The pictogram shows the amount of money that five friends raised for charity.



10 (a) Who raised the most money?

Answer ..... *(1 mark)*

10 (b) How much money did Ron raise?

Answer £ ..... *(1 mark)*

10 (c) How much money did the five students raise altogether?

.....

.....

Answer £ ..... *(2 marks)*

10 (d) Sid raised £42 for the same charity.

Explain why it may be difficult to show his amount on the pictogram.

.....

.....

(1 mark)

11 Sophie asks 18 pupils to choose their favourite fruit from a list.
These are her results.

apples	bananas	apples	oranges	oranges	apples
apples	plums	apples	oranges	apples	oranges
oranges	bananas	oranges	oranges	oranges	bananas

Sophie decides to draw a pie chart to show these results. The table shows some of his work.

Favourite vegetable	Tally	Frequency	Angle on pie chart
Bananas (B)	|||	3	60°
Apples (A)			
Oranges (O)			
Plums (P)			
		Total = 18	Total = 360°

11 (a) Complete the tally and frequency columns in the table.

(2 marks)

11 (b) (i) Complete the angle on the pie chart column in the table.

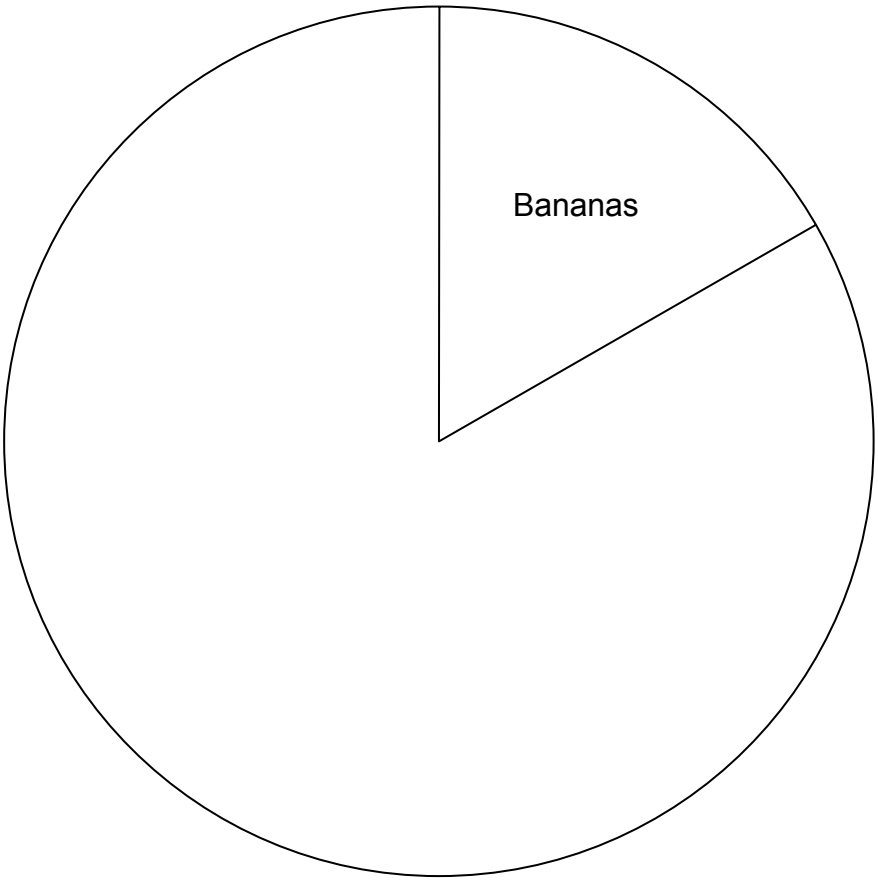
.....

.....

.....

(2 marks)

11 (b) (ii) Complete the pie chart to represent this information.



(2 marks)

12 (a) Hassan bought 90 tomato plants, 30 of which were a variety called Moneymaker. He measured and recorded their heights after 2 weeks.

Height (cm)	Number of plants	
3	0	
4	4	
5	6	
6	9	
7	8	
8	3	

Calculate the mean height.

.....

.....

Answer ..... *(3 marks)*

12 (b) The varieties Shirley and Alicante were bought at the same time.

Their heights are shown in the table.

		Height of Alicante (cm)						
		1	**2**	**3**	**4**	**5**	**6**	**Total**
Height of Shirley (cm)	**1**	0	**0**	0	0	0	0	0
	2	1	**0**	0	0	0	0	1
	3	2	**1**	1	0	0	0	4
	4	0	**3**	4	1	0	0	8
	5	0	**1**	2	3	2	0	8
	6	0	**0**	3	3	2	1	9
	Total	3	**5**	1	7	4	1	30

12 (b) (i) What is the median height for Shirley?

Show clearly how you obtain your answer.

.....

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Answer ..... *(2 marks)*

12 (b) (ii) Hassan claims that Shirley grows faster than Alicante.

How can you tell from the table that this is true?

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(1 mark)

There are no questions printed on this page

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ANSWER IN THE SPACES PROVIDED

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
TOTAL	

In the style of

General Certificate of Secondary Education
Foundation Tier

Mathematics 43601F

Past Paper Questions by Topic

Geometry

F

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.

Time allowed
- 1 hour 15 minutes

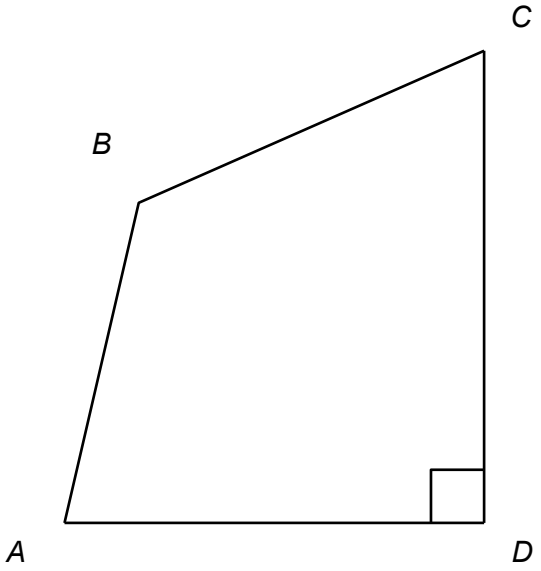
Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is.
- The quality of your written communication is specifically assessed in questions indicated with an asterisk (*)
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1 *ABCD* is a quadrilateral.



Complete each sentence using a letter.

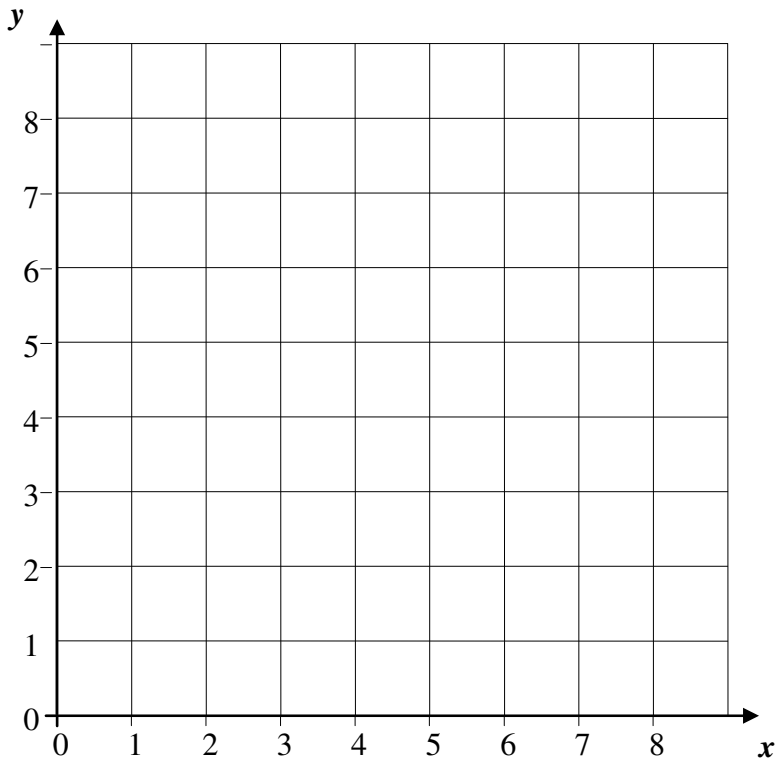
Angle ..... is a right angle.

Angle ..... is an obtuse angle.

Angle ..... is an acute angle.

(*2 marks*)

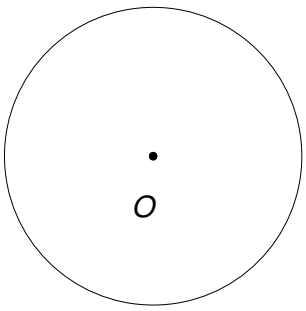
2 Here is a centimetre grid.



2 (a) On the grid, draw a circle of radius 3 centimetres with centre (5, 4).

(2 marks)

2 (b) Here is a circle, centre *O*.

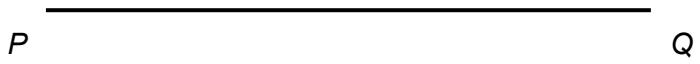


2 (b)(i) Mark with a cross a point on the circumference. (*1 mark*)

2 (b)(ii) Draw a diameter. (*1 mark*)

2 (b)(iii) Draw a tangent. (*1 mark*)

3 (a) Measure the length of line *PQ* in centimetres.



Answer ..... cm (*1 mark*)

3 (b) The length of line *RS* is 12 centimetres.

T is a point on *RS*

RT is $\frac{1}{4}$ of *RS*.

Work out the length of *RT*.

.....

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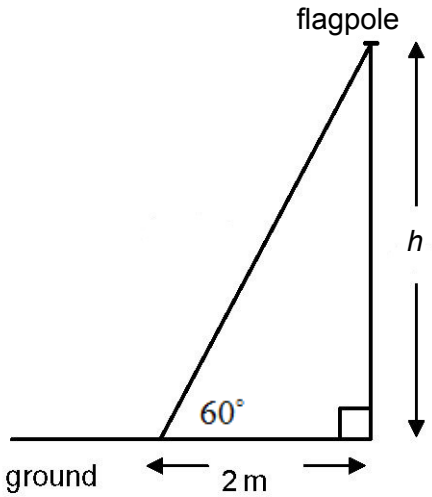
Answer ..... cm (*3 marks*)

4 The diagram shows a vertical flagpole. From 2 metres away the top of the flagpole is 70° from the ground.

Not drawn accurately



Make a scale drawing of this diagram.

The ground has been drawn for you.

Use a scale of 2 cm to represent 1 metre.

What is the height *h*? Show your answer on your scale drawing.

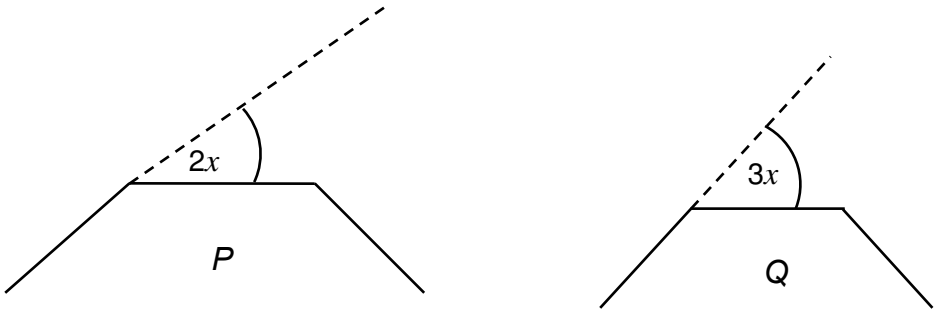
(*3 marks*)

5 The diagram shows parts of two regular polygons *P* and *Q*.

P has 12 sides and exterior angle $2x$.

Q has exterior angle $3x$.

Not drawn accurately



Work out the number of sides of regular polygon *Q*.

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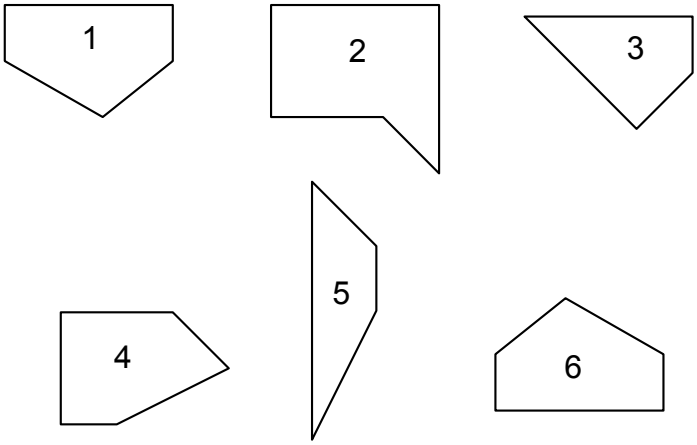
Answer ..... (*5 marks*)

6(a) Here are some shapes.



Which two shapes are congruent?

Answer..... and ..... (*1 mark*)

6(b) Tick whether each of the following statements is always true, sometimes true or never true.

Congruent shapes have the same perimeter.

☐ Always true ☐ Sometimes true ☐ Never true

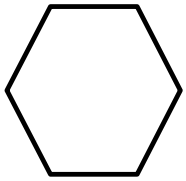
Congruent shapes have the same area.

☐ Always true ☐ Sometimes true ☐ Never true

(*2 marks*)

7 (a) Write down the mathematical name of each of the following.

.....



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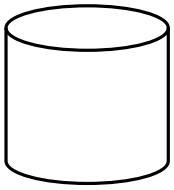


.....

(*3 marks*)

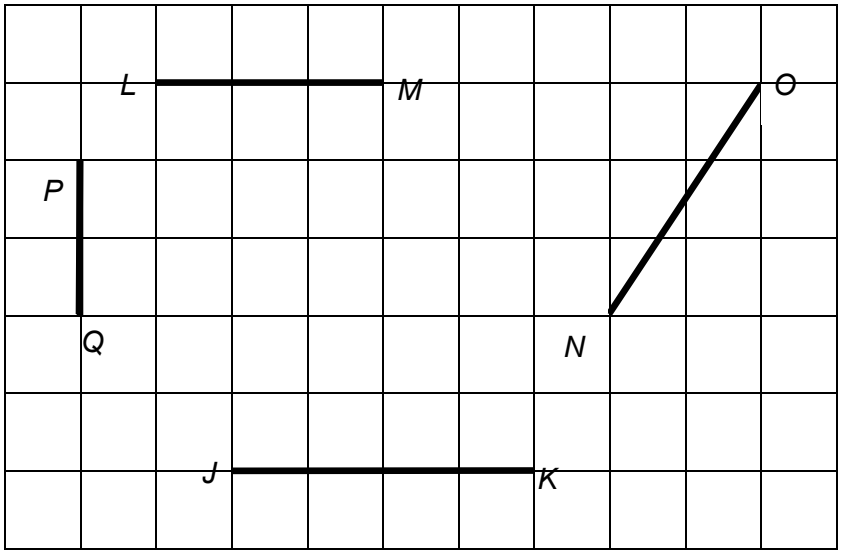
Here are two angles, a and b.

7 (b) What type of angles are they?

Answer a is.....

b is ..... (*2 marks*)

8 Here are some lines drawn on a grid.



8(a) Measure the length of *NO.*

Answer ..... cm (*1 mark*)

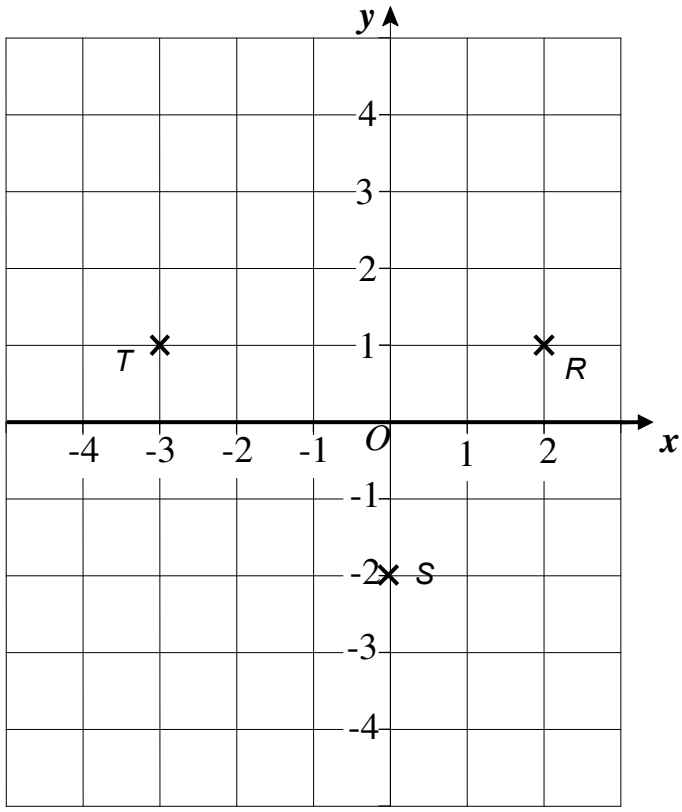
8(b) Which line is parallel to *LM.*

Answer ..... (*1 mark*)

8(c) Draw a line at right angles to *JK.*

(*1 mark*)

9 Points *R*, *S* and *T* are plotted on the grid.
They are three of the four corners of a quadrilateral.



9(a) Write down the coordinates of the point *T*.

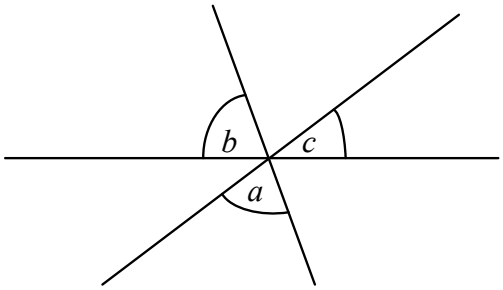
Answer (..... , ...) (*1 mark*)

9(b) Tick whether each of the following statements is true or false.

	True	False
It is possible to plot point *U* so that *RSTU* is a square.	☐	☐
It is possible to plot point *U* so that *RSTU* is a rectangle.	☐	☐
It is possible to plot point *U* so that *RSTU* is a parallelogram.	☐	☐

(2 marks)

10 Three straight lines meet at a point as shown.



Not drawn accurately

$b = 80°$

c is 40% of b.

Work out the size of a.

.....

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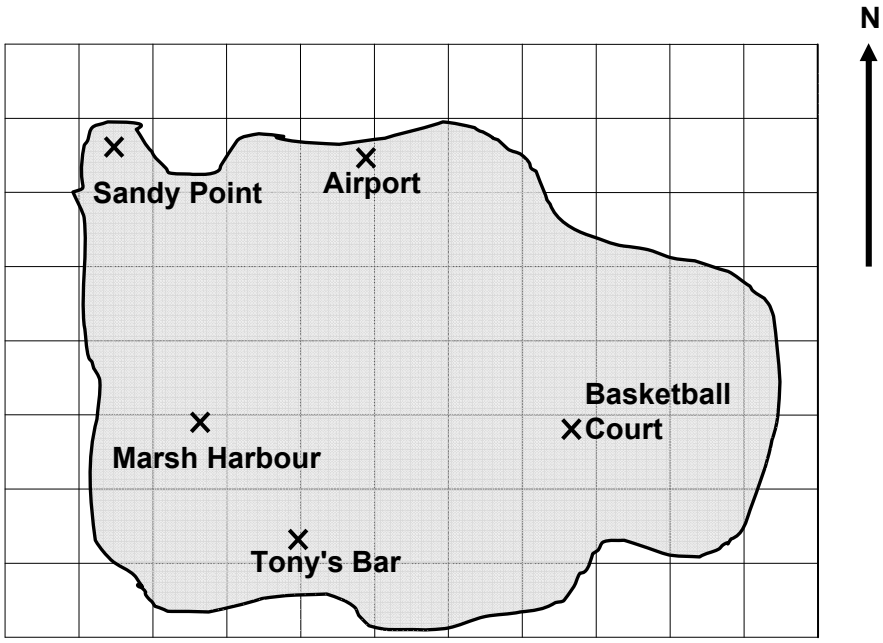
Answer ..... degrees (*4 marks*)

11 The diagram shows the map of an island drawn on a grid.

Each square represents 10 000 m².



11 (a) Estimate the area of the island.

Give your answer in square metres.

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.....

Answer ..... m² (*4 marks*)

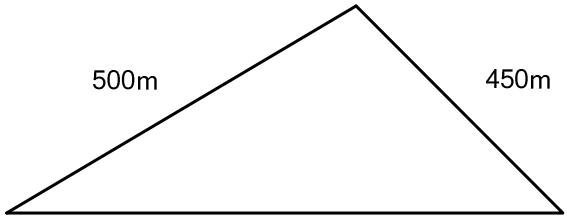
11 (b) Measure the bearing of the Tony's Bar from the Airport.

Answer ……..... (*1 mark*)

11 (c) A Baseball Stadium is on a bearing of 200° from the Airport and 070° from Marsh Harbour

Mark with a cross the position of the Baseball Stadium on the map. (*3 marks*)

12 Here is a triangle.



Not drawn accurately

Using ruler and compasses only, construct an accurate scale drawing of the triangle.
Use the scale 1 cm represents 50 m.

(*3 marks*)

13 (a) Here is a formula for the perimeter, P, of a rectangle.

$$P = 2L + 2W$$

Work out L when $P = 30$ cm and $W = 4$ cm

.....

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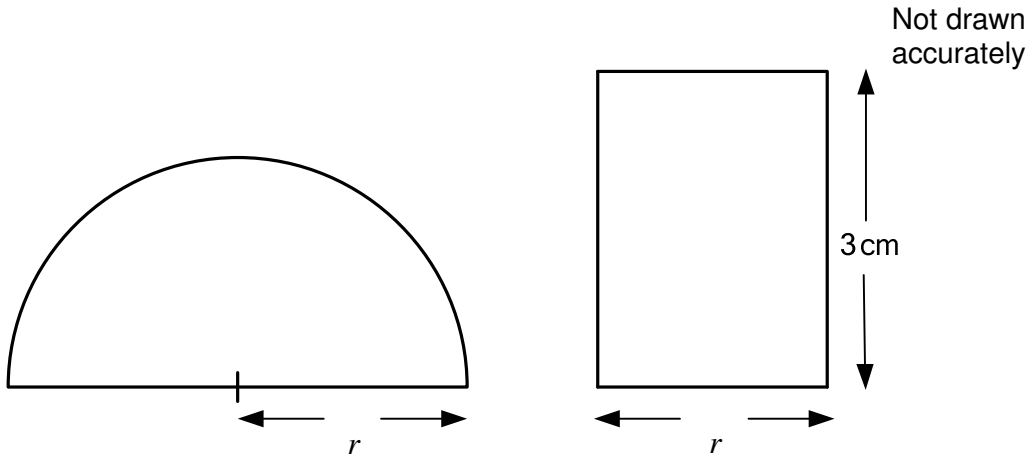
Answer ..... cm (*3 marks*)

13 (b) The diagram shows a semi-circle, radius r, and a rectangle.



The perimeters are equal.

Work out the value of r.

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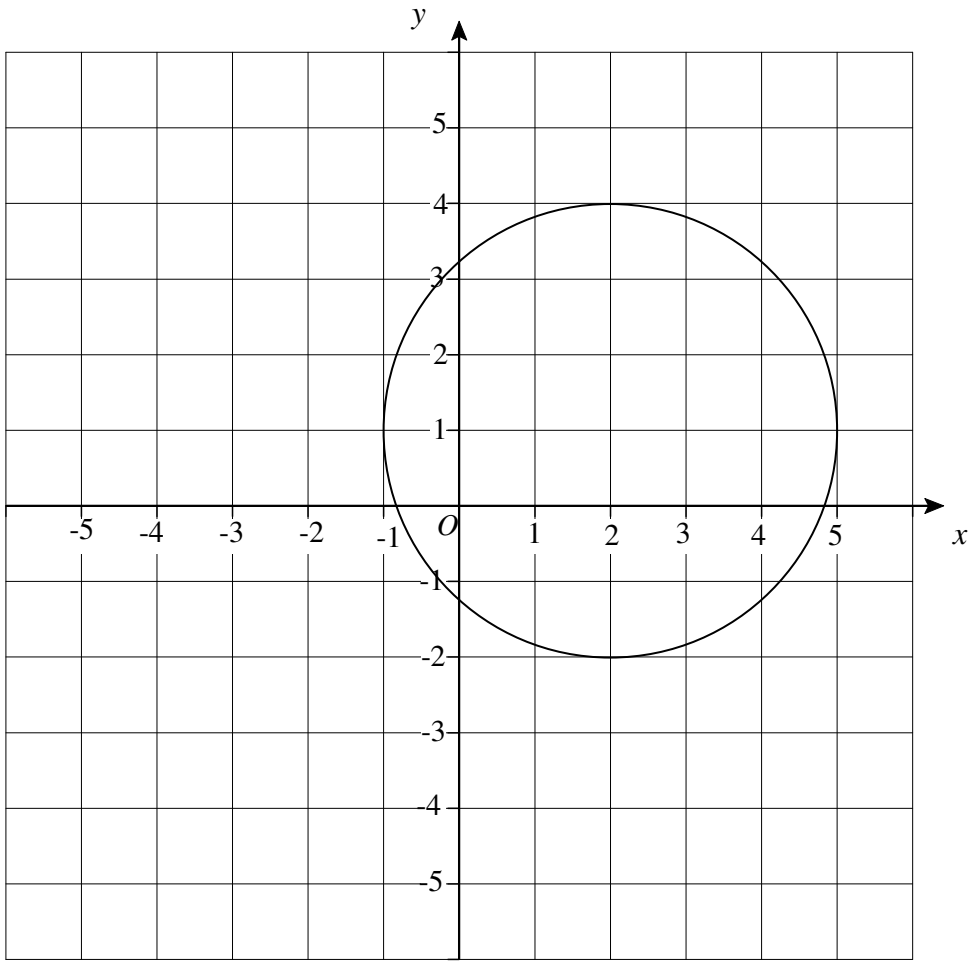
Answer ..... cm (*4 marks*)

14 The diagram shows a circle on a centimetre grid.



14(a) What is the length of a diameter of the circle.

Answer ..... cm (*1 mark*)

14 (b) What are the coordinates of the centre of the circle.

Answer (....., ...) (*2 marks*)

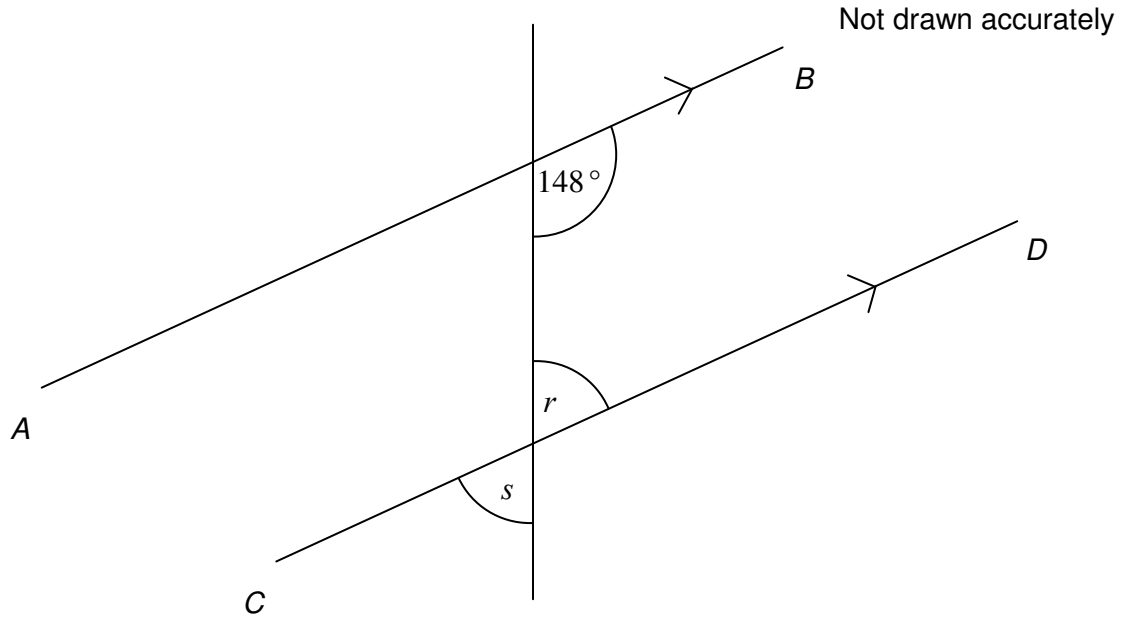
14 (c) Draw a tangent to the circle.

(*1 mark*)

14 (d) State the units for the area of the circle.

Answer ..... (*1 mark*)

15 In the diagram *AB* is parallel to *CD*.



15 (a) Work out the value of r.

.....

.....

Answer .....degrees (*2 marks*)

15 (b)(i) Write down the value of s.

.....

Answer .....degrees (*1 mark*)

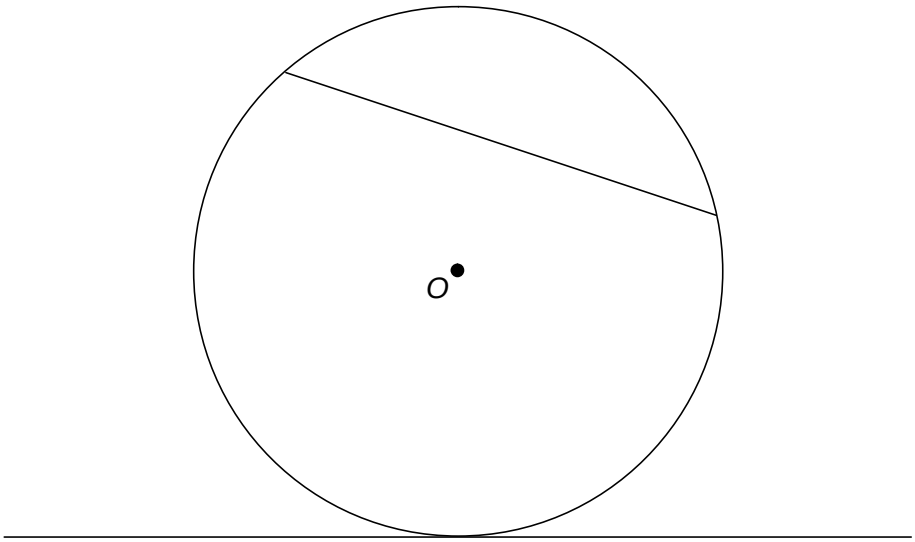
15 (b)(ii) Give a reason for your answer.

.....

.....

(*1 mark*)

16 The diagram shows a circle, centre *O*, with a tangent and a chord.



16 (a) Measure the diameter of the circle.

Answer ..... cm *(1 mark)*

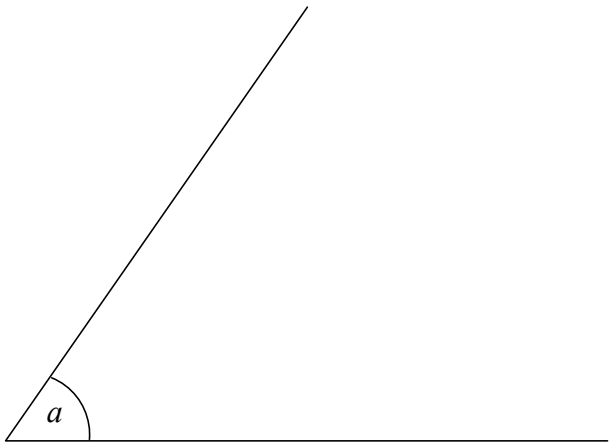
16 (b) The tangent meets the circle at point *T*.

Mark point *T* on the diagram. *(1 mark)*

16 (c) Mark a point on the chord that is 2 cm from *O*.

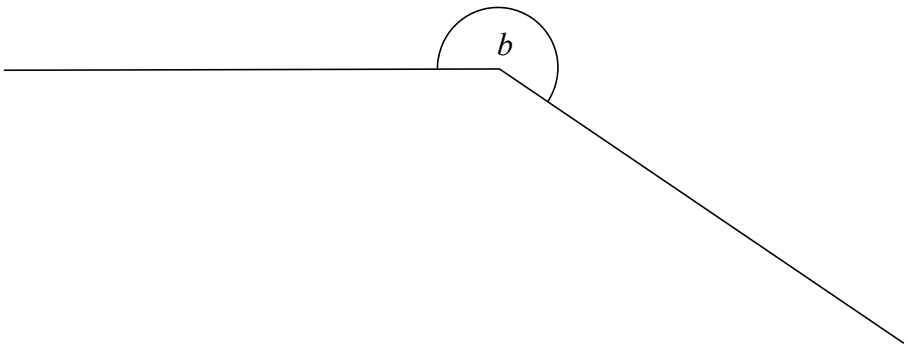
Label it *U*. *(1 mark)*

17 (a) Measure the acute angle a.



Answer ..... degrees *(1 mark)*

17 (b) Use measurements to work out the size of angle b.



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Answer ..... degrees *(2 marks)*

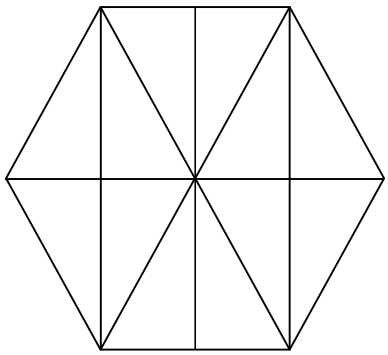
17 (c) An acute angle and an obtuse angle fit together to make an angle of 210°

Work out two possible values for the angles

.....

Answer .....degrees and..... degrees *(2 marks)*

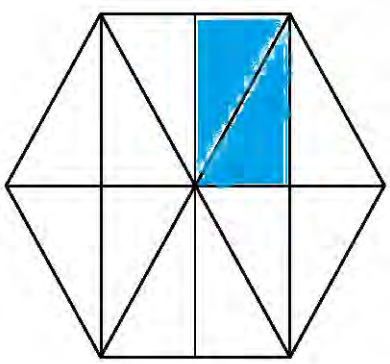
18 A regular hexagon is divided into congruent right-angled triangles.



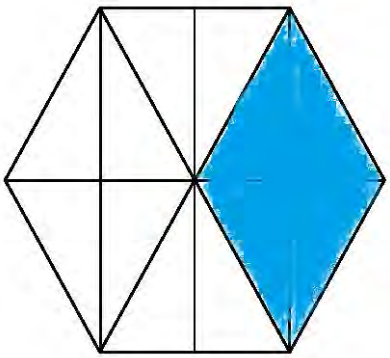
Here are the names of eight shapes:

Equilateral triangle	**Isosceles triangle**
Trapezium	**Rhombus**
Kite	**Rectangle**
Square	**Parallelogram**

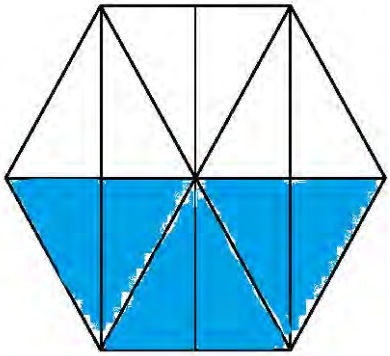
In the diagrams below some of the right-angled triangles have been shaded.
Match the shaded shapes with the correct name from the list above.

18(a) 

Name ..... *(1 mark)*

18 (b) 

Name ..... *(1 mark)*

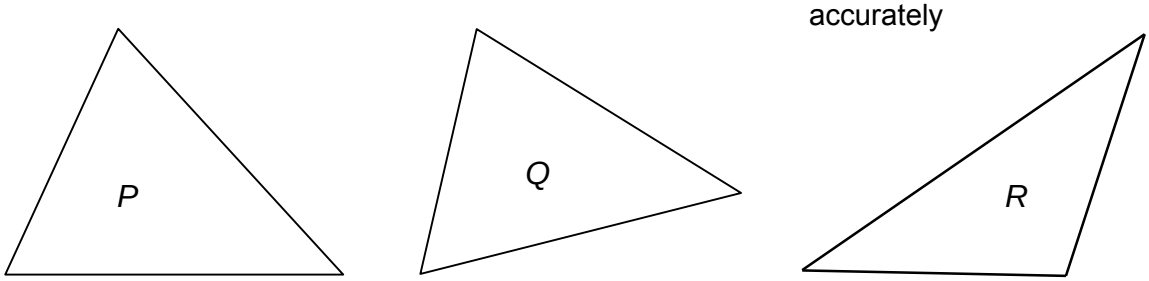
18 (c) 

Name ..... *(1 mark)*

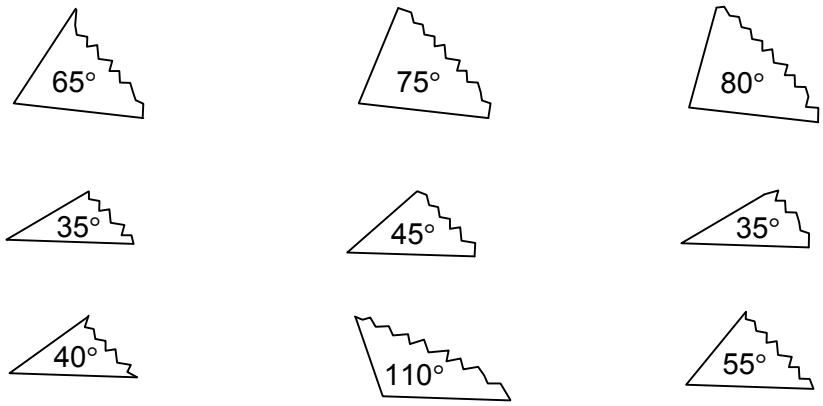
19 Three triangles, *P*, *Q* and *R* are cut out of paper.

The angles are measured.

Not drawn accurately



The corners are torn off each triangle and mixed up as shown.



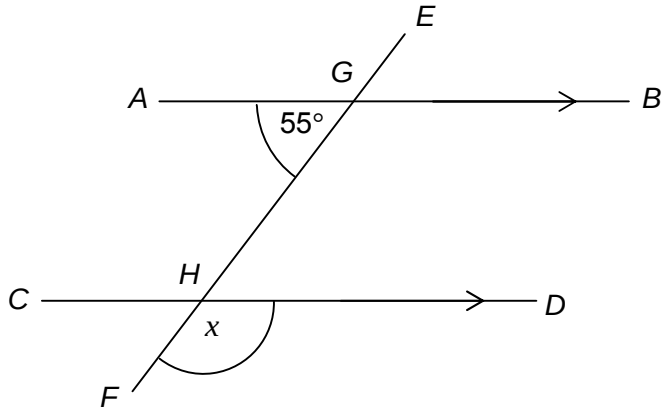
Identify three sets of angles that could go with each triangle.

Angles ..... and ..... and.....

Angles ..... and ..... and.....

Angles ..... and ..... and..... *(3 marks)*

20 In the diagram *AB* is parallel to *CD*.



Not drawn accurately

Work out the value of the angle marked x in the diagram.

Show clearly, giving reasons, how you work out your answer.

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Answer .....degrees *(3 marks)*

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ANSWER IN THE SPACES PROVIDED

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
2 – 3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
TOTAL	

In the style of AQA

General Certificate of Secondary Education
Foundation Tier

Mathematics 43602F

Past Paper Type Questions by Topic

Graphs

F

For this paper you must have:
- a calculator
- mathematical instruments.

Time allowed
- 1 hour

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is.
- The quality of your written communication is specifically assessed in some questions . These questions are indicated with an asterisk (*)
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

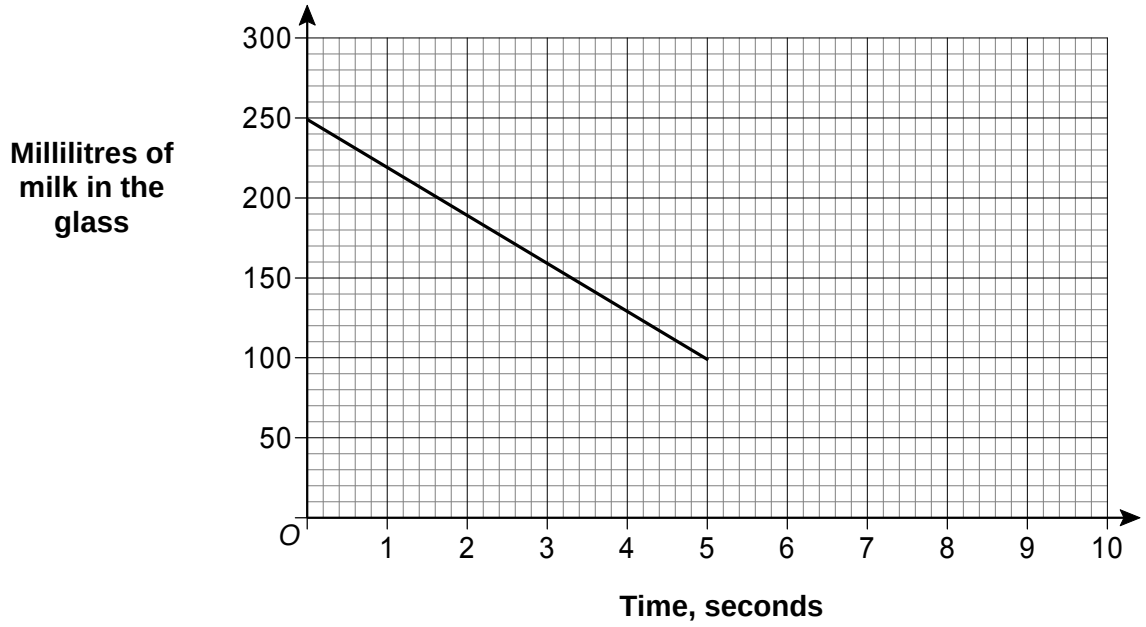
Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1 Georgina has 250 millilitres of milk in a glass.

She takes five seconds to drink some of the milk.

The graph shows this information.



1 (a) How many millilitres of milk did Georgina drink in five seconds?

.....

Answer .....

(1 mark)

1 (b) Georgina does not drink any milk for the next two seconds.

She then drinks all the remaining milk in three seconds.

Show this information on the graph.

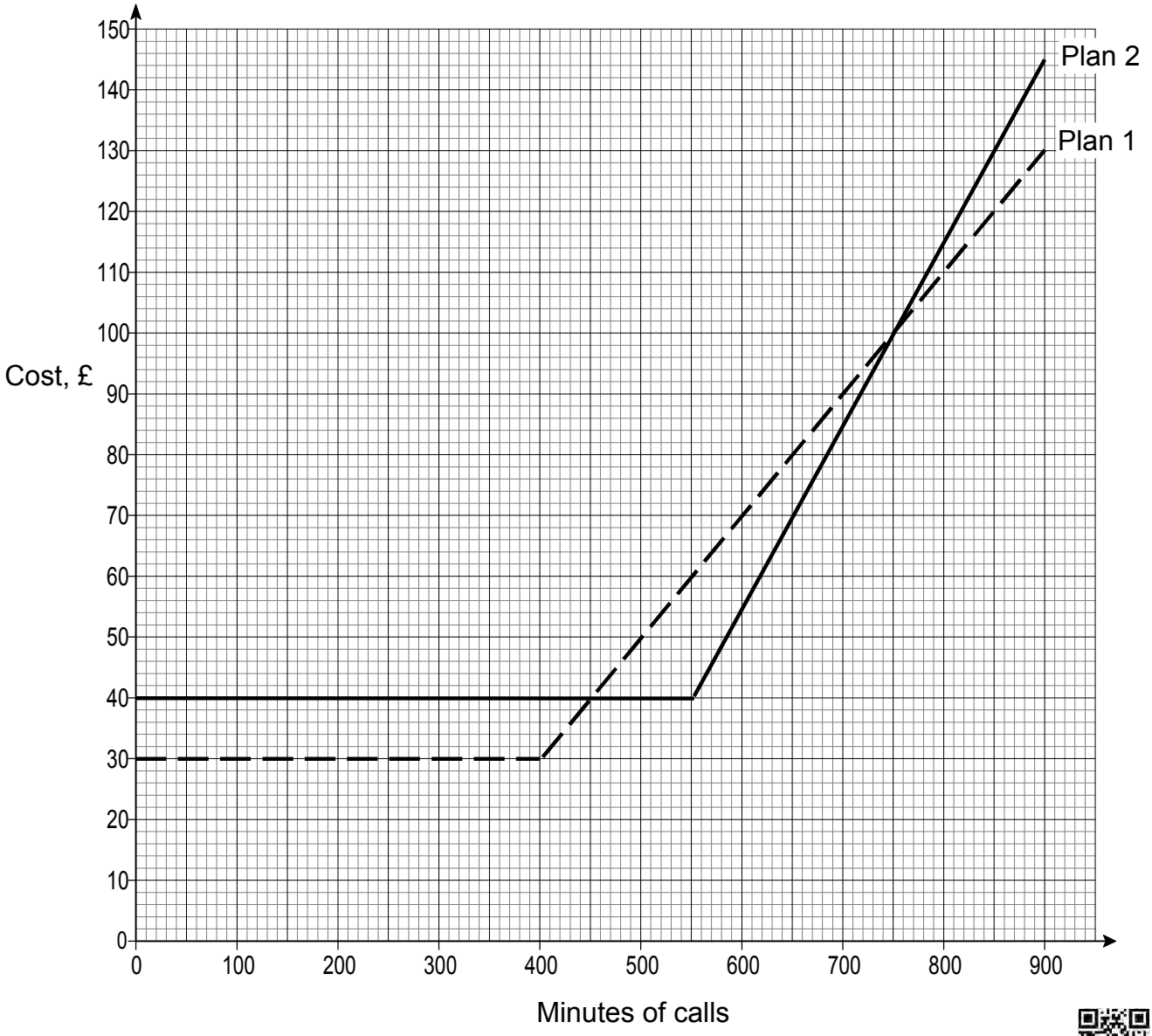
(2 marks)

2 Here is a mobile phone tariff.

Plan 1	
Monthly charge	£30
Free minutes of calls per month	400
Extra minutes charged at	20 pence per minute

Plan 2 is a different mobile phone tariff.

These graphs show the cost, in £, for each of the plans.



2 (a) Complete the mobile phone tariff for Plan 2.

.....

.....

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.....

Plan 2	
Monthly charge	£40
Free minutes of calls per month	
Extra minutes charged at	…… pence per minute

(4 marks)

2 (b) Louis is deciding whether to use Plan 1 or Plan 2.

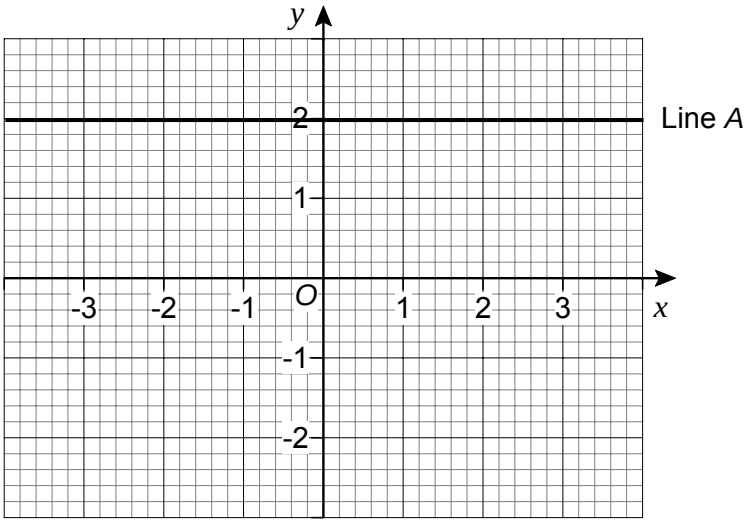
Work out the number of minutes of calls for which Plan 2 is cheaper.

.....

.....

(2 marks)

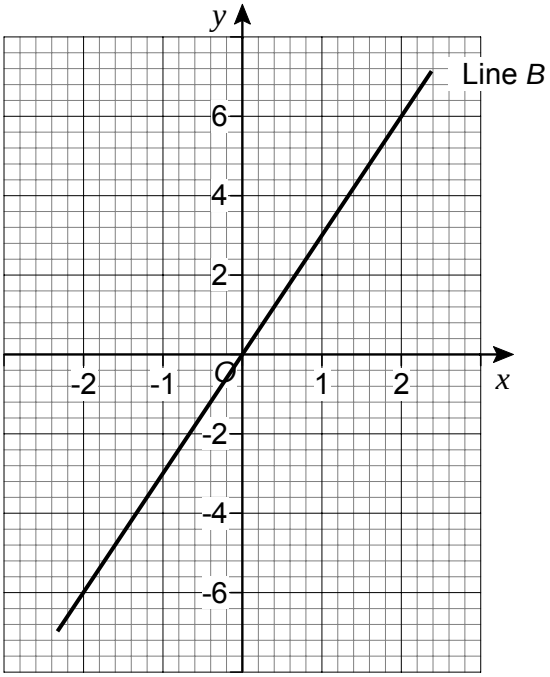
3 (a) Line *A* is drawn on the grid.



What is the equation of Line *A*?

Answer ..... *(1 mark)*

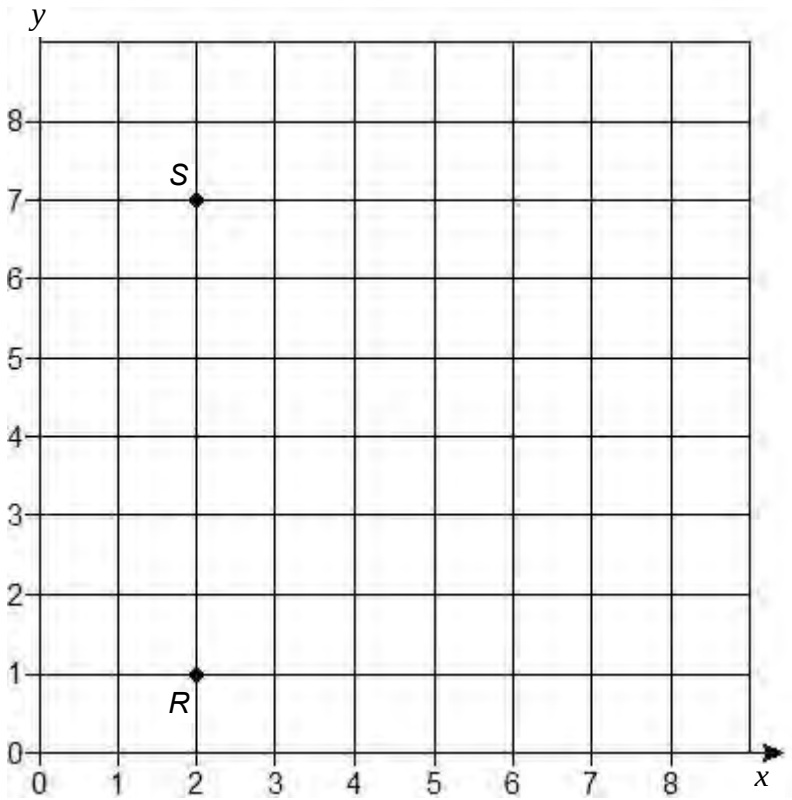
3 (b) Line *B* is drawn on the grid.



What is the gradient of Line *B*?

Answer .....*(1 mark)*

4 Points *R* and *S* are shown on the grid below.



4 (a) Write down the coordinates of *R*.

Answer (....., ...) *(1 mark)*

4 (b) Plot the point *M* (4, 2) on the grid. *(1 mark)*

4 (c) *M* is the midpoint of the line segment *RT*.

4 (c) (i) Mark the position of *T* on the grid. *(1 mark)*

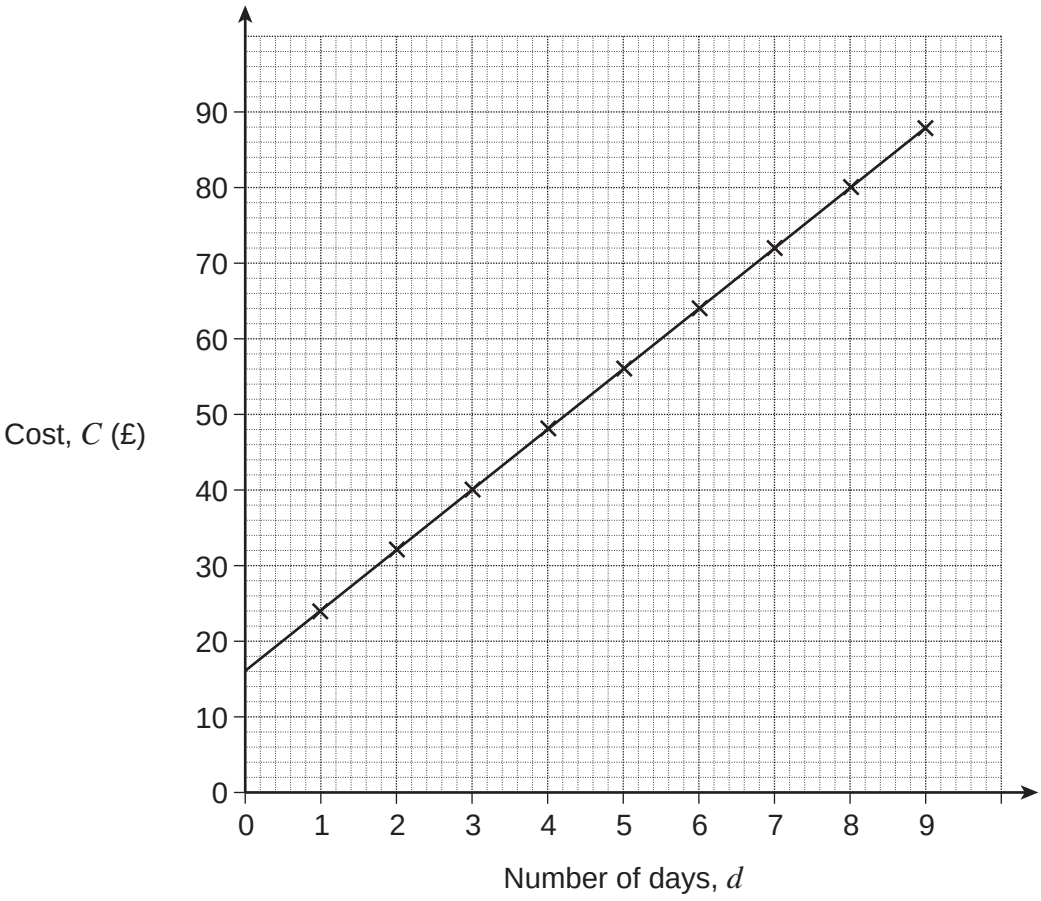
4 (c) (ii) Write down the coordinates of *T*.

Answer (....., ...) *(1 mark)*

4 (d) The points *R*, *S* and *U* are on a straight line. The point *U* is twice as far from *R* as point *S*. Write down the coordinates of *U*.

Answer (....., ...) *(2 marks)*

5 The graph shows the cost, C (£), of hiring a concrete mixer from Redwood Plant Hire for a number of days, d.



5 (a) Circle the correct formula for the cost, C.

$C = 24d$ $C = 8d + 24$ $C = 16d + 8$ $C = 8d + 16$

.....

.....

(1 mark)

5 (b) The cost of hiring a concrete mixer from Greens Plant Hire is given by the formula

$$C = 9d + 11$$

Helen thinks that Greens Plant Hire is always cheaper.

Is this true?
Tick a box.

Yes ☐ No ☐

Give reasons for your answer.

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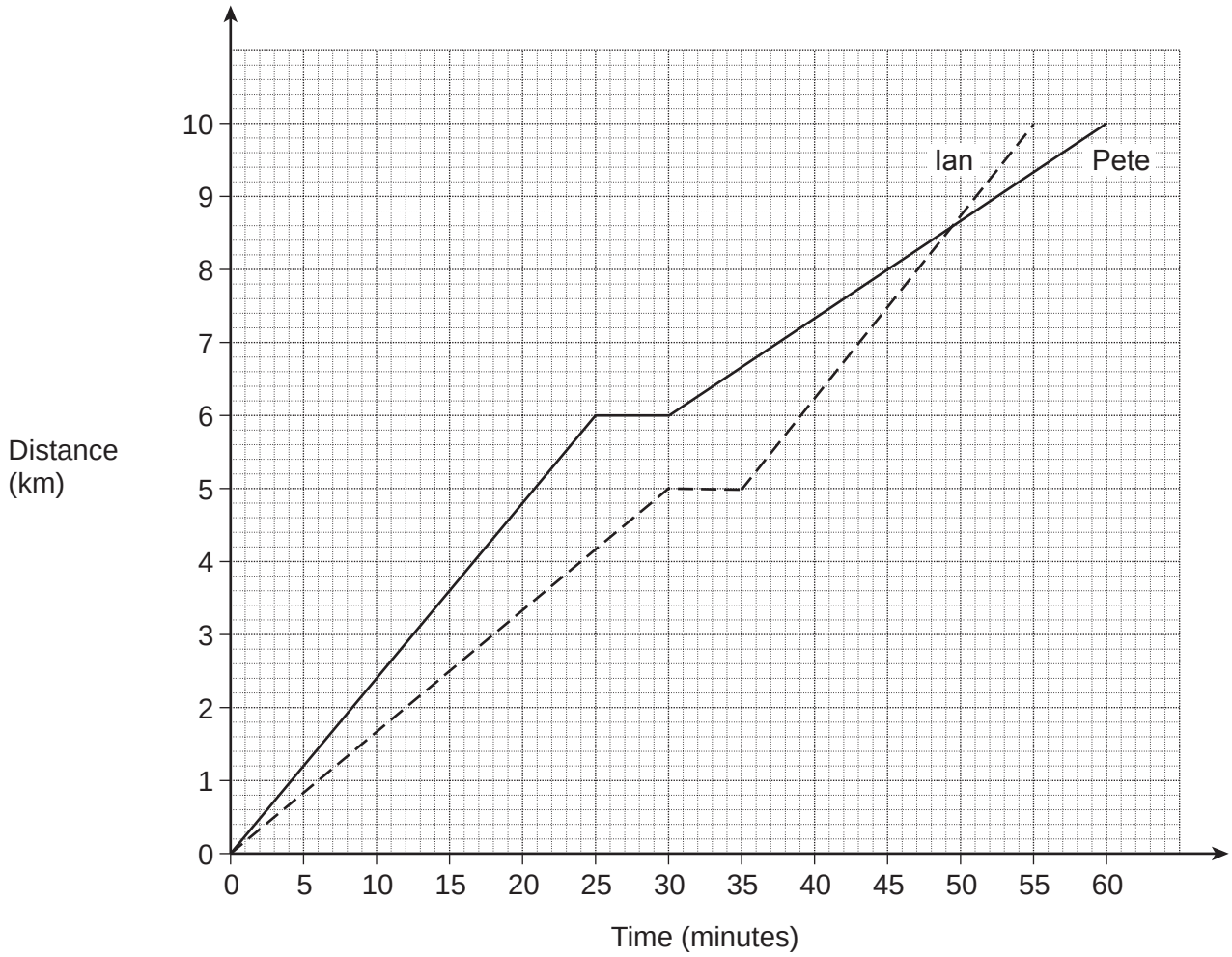
(3 marks)

6 The graph shows two training runs by Ian and Pete.



6 (a) After how many minutes does Ian overtake Pete?

Answer ..... minutes *(1 mark)*

6 (b) How far ahead is Pete when Ian starts again after his rest?

.....

.....

Answer ..... km *(2 marks)*

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In the style of AQA

General Certificate of Secondary Education
Higher Tier

Mathematics 43602H

Past Paper Type Questions by Topic

Histograms

H

For this paper you must have:
- a calculator
- mathematical instruments.

Time allowed
- 1 hour

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
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- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

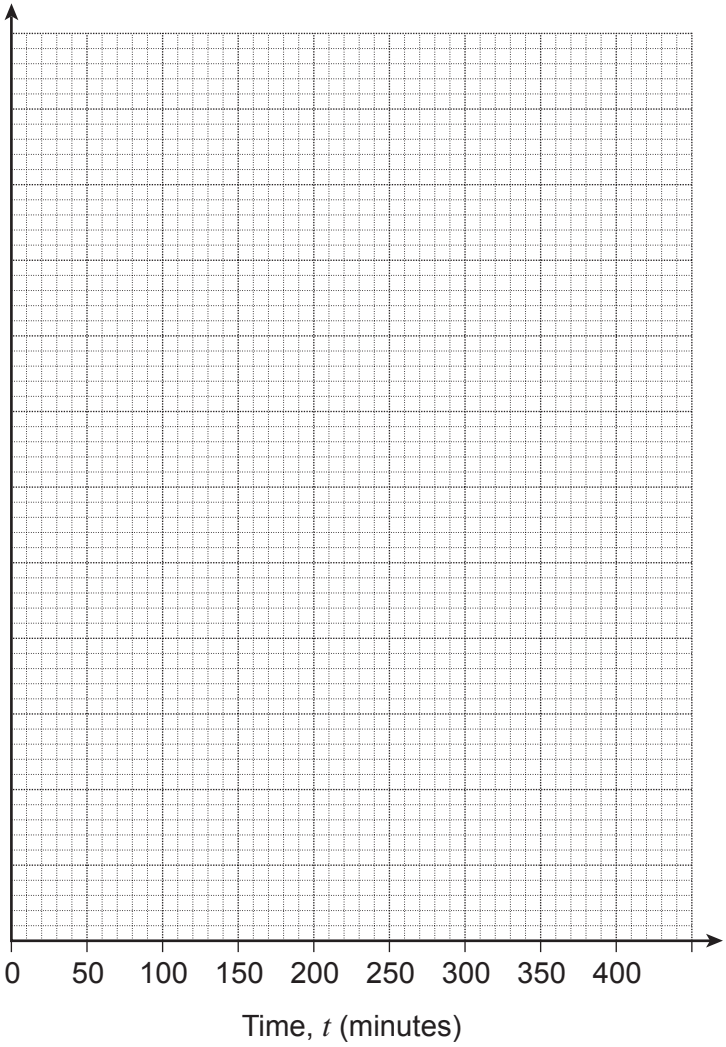
Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1 The table shows information about the length of time that 180 children spent on facebook.

Time, *t* (minutes)	**Frequency**
$60 < t \leqslant 150$	18
$150 < t \leqslant 180$	66
$180 < t \leqslant 240$	60
$240 < t \leqslant 360$	36

1 **(a)** Draw a suitable frequency diagram for the data.



(3 marks)

1 (b) Calculate an estimate of the average length of time for those people who are on facebook for over three hours.

.....

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Answer ..... minutes *(2 marks)*

1 (c) Two children are chosen at random from the 180 children.

Estimate the probability that both are on facebook for less than two hours.

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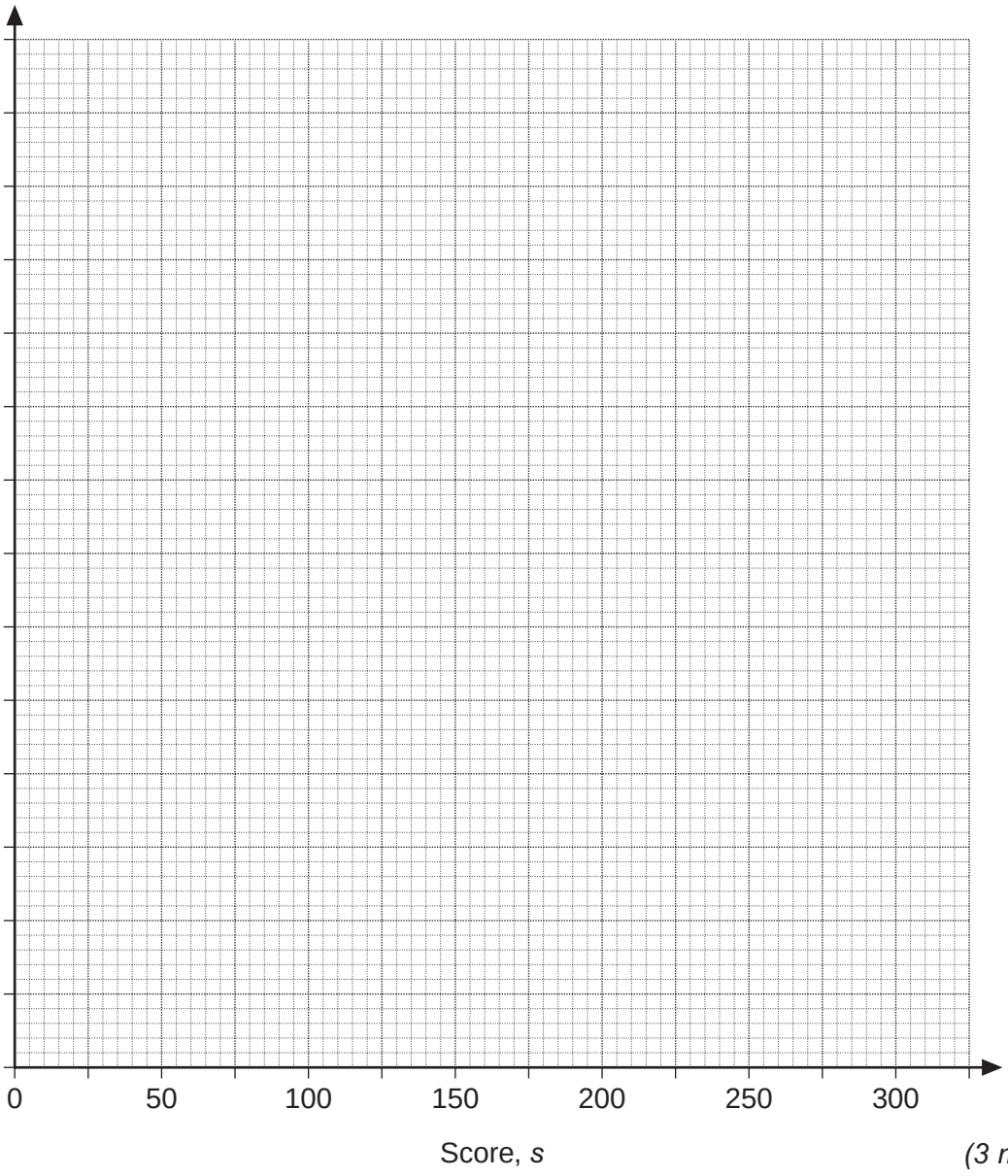
Answer ..... *(3 marks)*

2 The table shows the cricket scores for a local club over a season.

Score, s	Frequency
$75 < s \leqslant 125$	40
$125 < s \leqslant 150$	55
$150 < s \leqslant 175$	65
$175 < s \leqslant 225$	95
$225 < s \leqslant 300$	45
Total	300

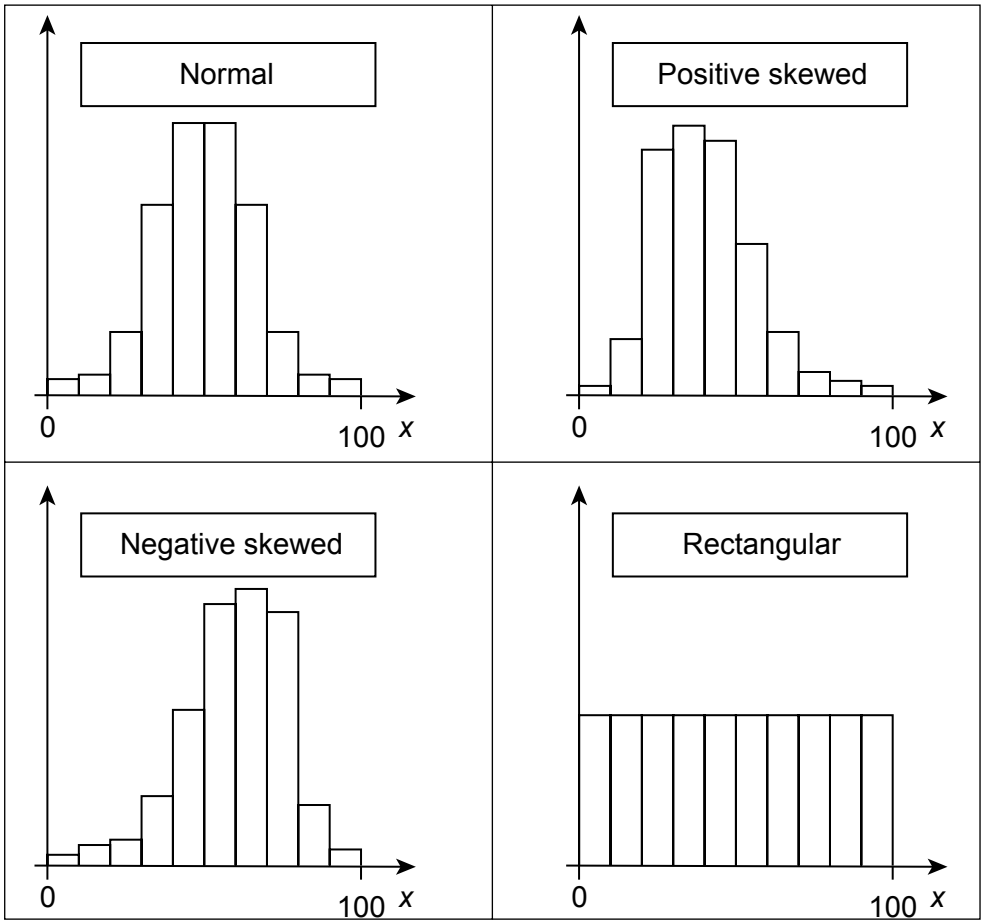
Draw a fully labelled histogram to illustrate the data.

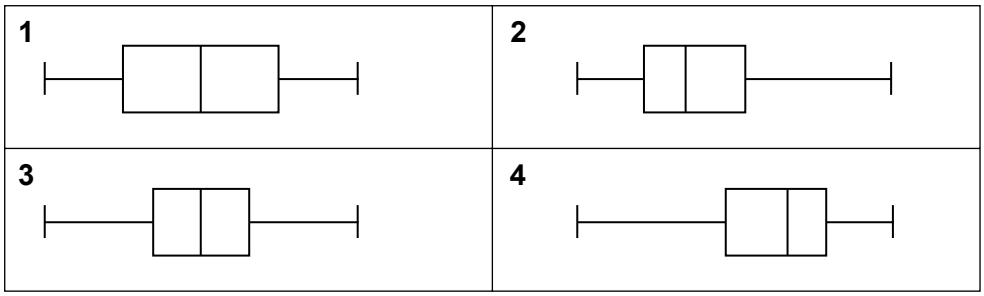


(3 marks)

3 Four histograms for a variable x with values from 0 to 100 are shown below.

Four box plots for the same histograms are also shown. Match each histogram to the correct box plot.





Normal histogram is shown by box plot .....

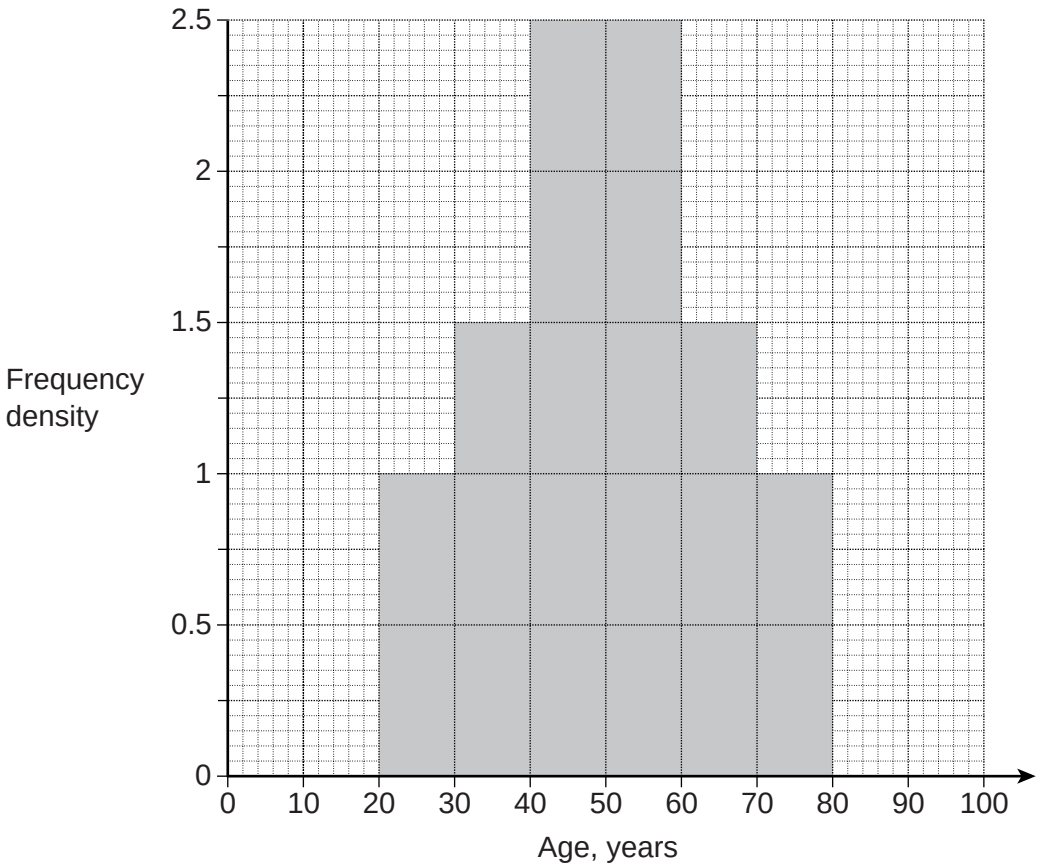
Positive skewed histogram is shown by box plot .....

Negative skewed histogram is shown by box plot .....

Rectangular histogram is shown by box plot .....

(3 marks)

4 The histogram shows the distribution of ages of 100 members of a bowling club.



4 (a) How many members of the club were less than 40 years old?

.....

Answer ..... *(1 mark)*

4 (b) How many members of the club are between 40 and 60 years old?

.....

Answer ..... *(1 mark)*

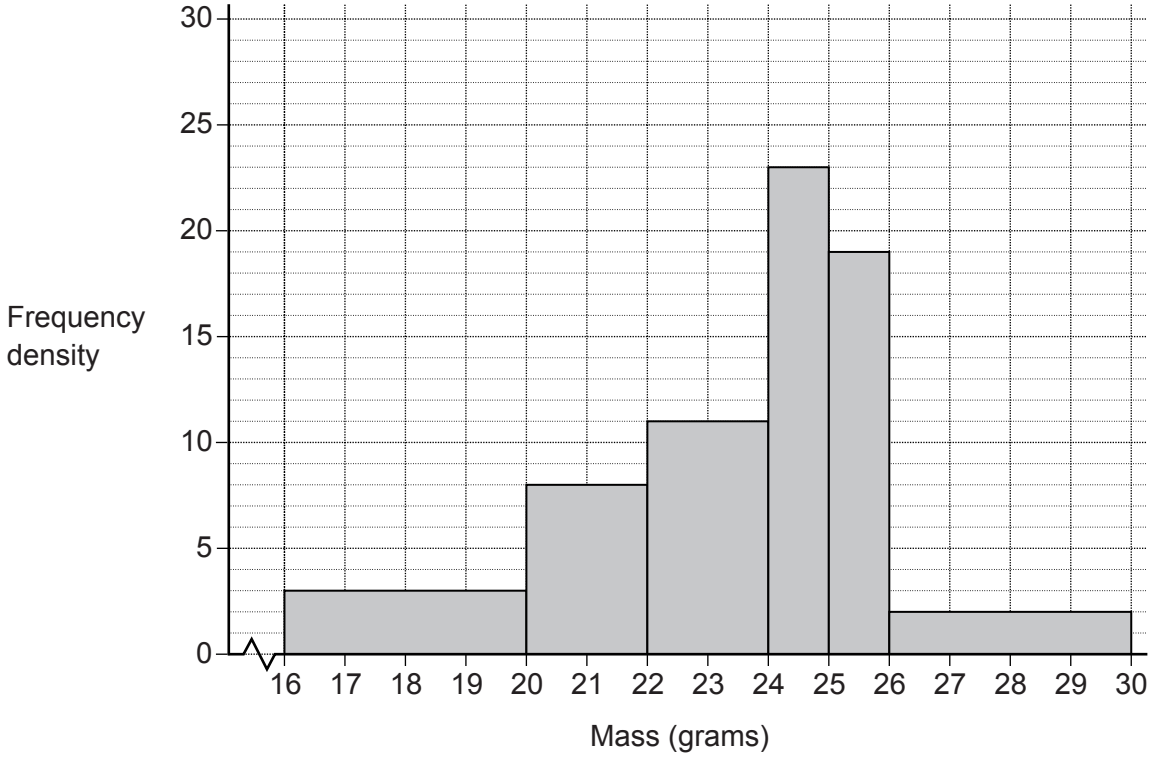
4 (c) Work out the inter-quartile range of the ages.

.....

.....

Answer ..... years *(2 marks)*

5 The histogram shows the distribution of the masses of 100 mice.



Calculate an estimate of the mean mass.

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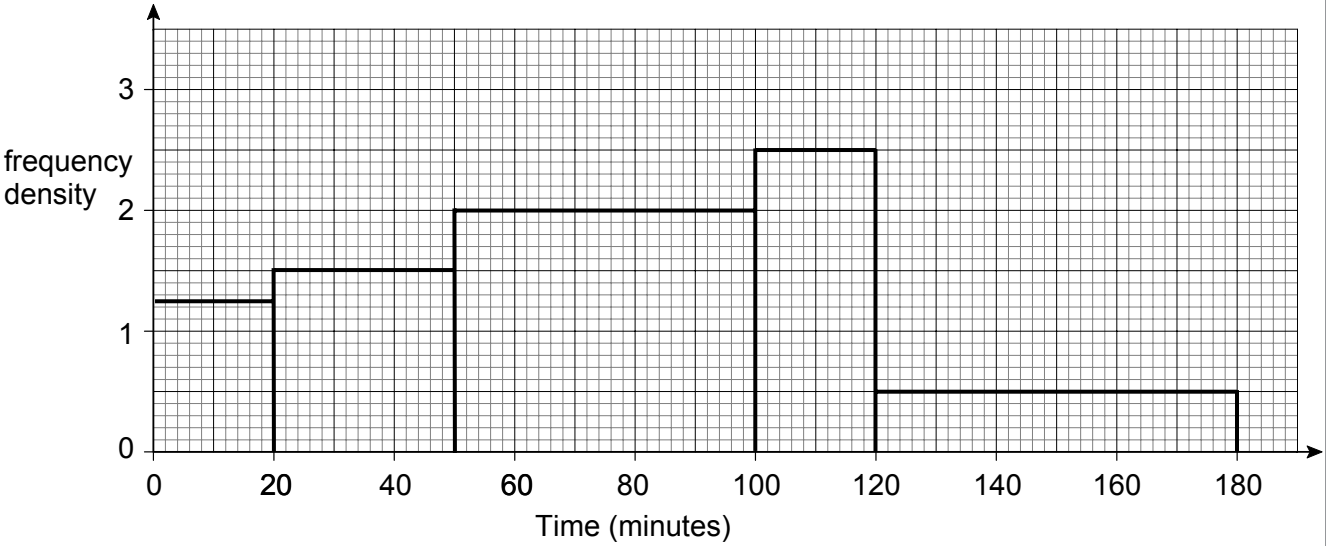
Answer ..... grams *(4 marks)*

6 The histogram and the frequency table show some information about how much time some people spent shopping.

Time (minutes)	Number of people
$0 < t \leq 20$	25
$20 < t \leq 50$	45
$50 < t \leq 100$	100
$100 < t \leq 120$	50
$120 < t \leq 180$	30



Fifty people were shopping for more than T minutes.

Calculate an estimate of the value of T.

.....

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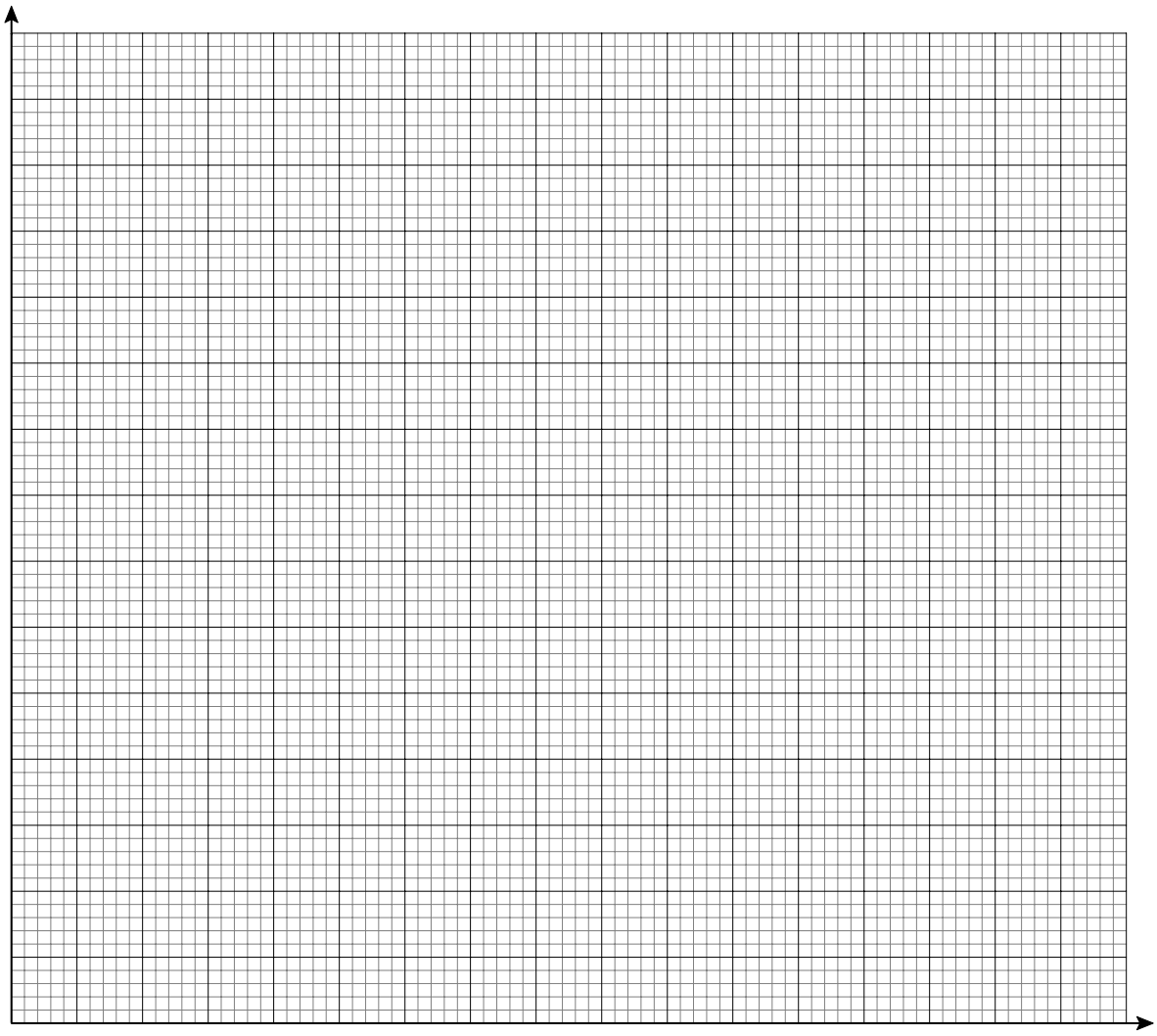
.....

Answer ..... minutes (3 marks)

7 The table shows the height of 100 hills in England.

Height, h (metres)	**Frequency**	
$0 < w \leq 500$	34	
$500 < w \leq 1000$	28	
$1000 < w \leq 2000$	22	
$2000 < w \leq 4000$	16	

7 (a) Draw a fully labelled histogram to show the heights of the hills.



(3 marks)

7 (b) Estimate the probability that 2 hills picked at random were over 500 metres in height.

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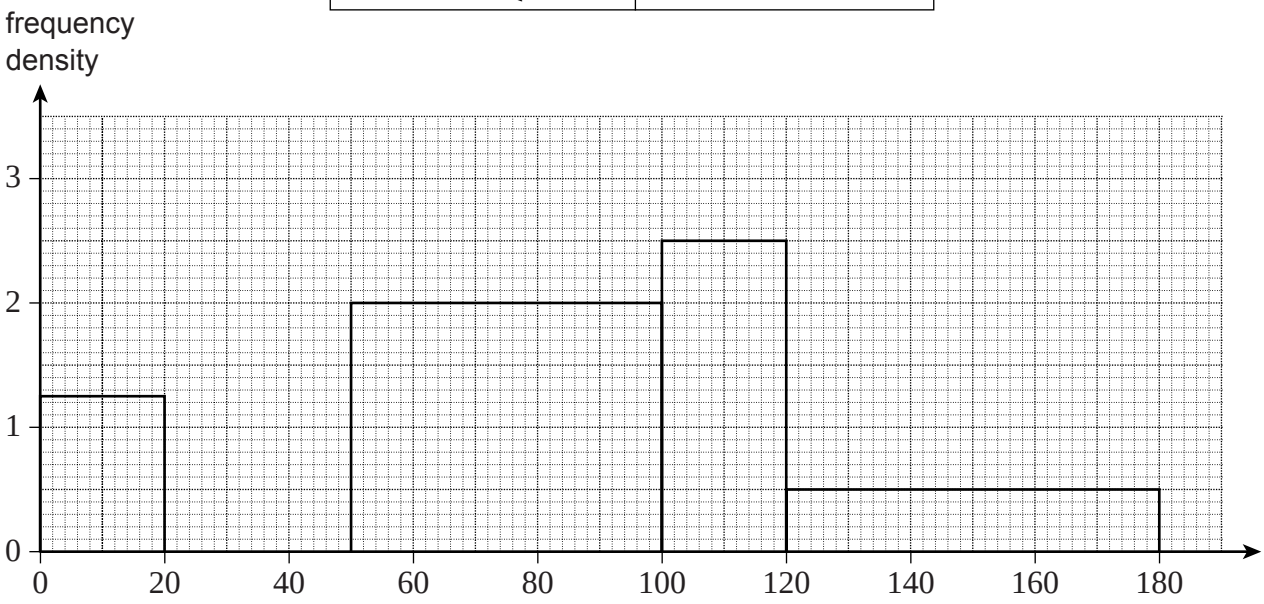
Answer ..... *(3 marks)*

8 The histogram and the frequency table show some information about how much time some people spent shopping.

Time (minutes)	Number of people
$0 < t \leqslant 20$	25
$20 < t \leqslant 50$	45
$50 < t \leqslant 100$	
$100 < t \leqslant 120$	50
$120 < t \leqslant 180$	30



8 (a) Complete the histogram and fill in the missing number in the frequency table.

.....

.....

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(2 marks)

8 (b) Fifty peoplle were shopping for more than T minutes.

Calculate an estimate of the value of T.

.....

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.....

Answer T = ... minutes *(3 marks)*

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General Certificate of Secondary Education
Foundation Tier

Mathematics 43601F

Past Paper Questions by Topic

Number

F

For this paper you must have: • mathematical instruments. You must **not** use a calculator.	

Time allowed
- 1 hour 15 minutes

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
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- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1 (a) Work out 7500 + 1500

Write your answer in words.

.....

.....

.....

Answer .....

(2 marks)

1 (b) Write 5758 to the nearest hundred.

Answer .....

(1 mark)

1 (c) What is the value of the digit 3 in the number 423 985?

Answer .....

(1 mark)

1 (d) Write down the positive square root of 100.

Answer .....

(1 mark)

1 (e) Which of these is equal to one million?

Circle your answer.

10^3 10^4 10^5 10^6 10^7

(1 mark)

2 The heights of three mountains in England are shown.

Scafell Pike	978 metres
Helvellyn	950 metres
Skiddaw	931 metres

2 (a) Write down the height of Scafell Pike to the nearest 10 metres.

Answer ..... metres

(*1 mark*)

2 (b) Write down the height of Skiddaw to the nearest 100 metres.

Answer ..... metres

(*1 mark*)

2 (c) Noah and Will do a sponsored run.

They both run up each of the three mountains. They are each sponsored for 40p per metre of height. They want to raise at least £2000 altogether.

Do they succeed?

.....

.....

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.....

(*4 marks*)

3 Use the numbers from this list to answer the questions.

5 12 13 25 28 30 42 49

3 (a) Write down all the multiples of 4.

Answer ..... *(2 marks)*

3 (b) Write down all the factors of 100.

Answer ..... *(2 marks)*

3 (c) Write down a square number.

Answer ..... *(1 mark)*

3 (d) Write down three numbers that have a sum of 100.

Answer ..... and..... and..... *(1 mark)*

4 Here are two numbers.

fifty thousand 6500

Which number is bigger?

Give a reason for your answer.

Bigger number .....

Reason .....

.....

(2 marks)

5 a, b and c are three positive whole numbers.

a is one-fifth of c.

b is one-sixth of c.

c is less than 100.

What values could c take?

.....

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.....

.....

Answer .....

(5 marks)

6 The numbers 29 and 31 are consecutive prime numbers.

The number halfway between them is 30.

30 is **not** a square number.

Find a pair of consecutive prime numbers less than 30 where the number halfway between them is a square number.

.....

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.....

Answer .....and.....

(2 marks)

7 Work out $8^2 \div 4^3$

.....

.....

.....

Answer ..... *(2 marks)*

8 You are given that $31.7 \times 24 = 760.8$

8 (a) Write down the value of 317×24

.....

Answer ..... *(1 mark)*

8 **(b)** Write down the value of $76.08 \div 24$

.....

Answer ..... *(1 mark)*

8 (c) Work out the value of 31.7×25

.....

.....

.....

Answer ..... *(2 marks)*

9 (a) In the final of Britain's Got Talent there are 2 singers and 1 magician.

What fraction are singers?

Answer ..... *(1 mark)*

9 (b) The number of votes that the winner receives is 2 827 273.

Write this number to the nearest million.

Answer ..... *(1 mark)*

9 (c) One in every five households watched the final on TV.

What percentage of households watched the final?

.....

.....

Answer ..... % *(2 marks)*

10 (a) A century means 100 years

10 (a) (i) How many years is half a century?

.....

Answer ..... *(1 mark)*

10 (a) (ii) A house is 63 years old.

How many more years will it be before becomes a century old?

.....

Answer ..... *(1 mark)*

10 (b) A race is run over a distance of fifteen hundred metres. Write this distance in figures.

Answer ..... metres *(1 mark)*

10 (c) Write down the square root of 64.

.....

Answer ..... *(1 mark)*

10 (d) Two numbers have a difference of 40.
Each number is a factor of 100.

Work out the two numbers

.....

.....

Answer ..... and ..... *(2 marks)*

*11(a) (i) Simplify the expression $n \times 5$

Answer ..... *(1 mark)*

11 (a) (ii) Simplify fully $2x + 5y + 3x - 2y$

Answer ..... *(2 marks)*

11 (b) m represents an even number.

Explain why $(m + 1)(m - 1)$ is always odd.

.....

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(2 marks)

12 (a) Circle **all** the prime numbers in this list.

3 6 7 9 10 13 15

(2 marks)

12 (b) x is a positive whole number. $6x - 1$ is not a prime number.
Work out a possible value for x.

.....

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.....

.....

Answer ..... *(2 marks)*

13 (a) (i) Write down a multiple of 6 that is greater than 20.

Answer ..... *(1 mark)*

13 (a) (ii) Write down a factor of 20 that is less than 6.

Answer ..... *(1 mark)*

13 (b) Use these mathematical terms to complete the statements below.

cube cube root square square root

10 is the ……..... of 100

144 is the ……..... of 12

5 is the ……..... of 125

(3 marks)

13 (c) This is Hassan's working for the calculation $12 + 4 \times 10$

$$12 + 4 = 16$$
$$16 \times 10 = 160$$
$$\text{Answer} = 160$$

Hassan is wrong.

Work out the correct answer for the calculation.

.....

.....

Answer ..... *(1 mark)*

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In the style of

AQA

General Certificate of Secondary Education
Foundation Tier

Mathematics 43601F

Past Paper Questions by Topic

Pie Charts

F

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.

Time allowed
- 1 hour 15 minutes

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
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Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1 A car park is open from 9 am to 6 pm.

1 (a) (i) 80 cars enter between 9 am and 10 am.
One-quarter of these cars are white.

How many white cars enter between 9 am and 10 am?

.....

Answer ..... *(1 mark)*

1 **(a) (ii)** 115 cars enter between 10 am and 11 am.
Tara says, "Exactly one-quarter of these cars are white." Show that she is wrong.

.....

.....
(1 mark)

1 **(b)** A data logging machine counts cars entering and leaving the car park.

Hour ending at	Cars entering	Cars leaving
10 am	80	5
11 am	115	25
12 noon	75	40
1 pm	35	35
2 pm	50	50
3 pm	40	45
4 pm	20	65
5 pm	10	115
6 pm	5	30

1 **(b) (i)** The car park is empty at 9 am.

How many cars are in the car park at 10 am?

.....

Answer ..... *(1 mark)*

1 **(b) (ii)** Traffic lights stop cars entering when the car park is full.
The car park is full at 12 noon.

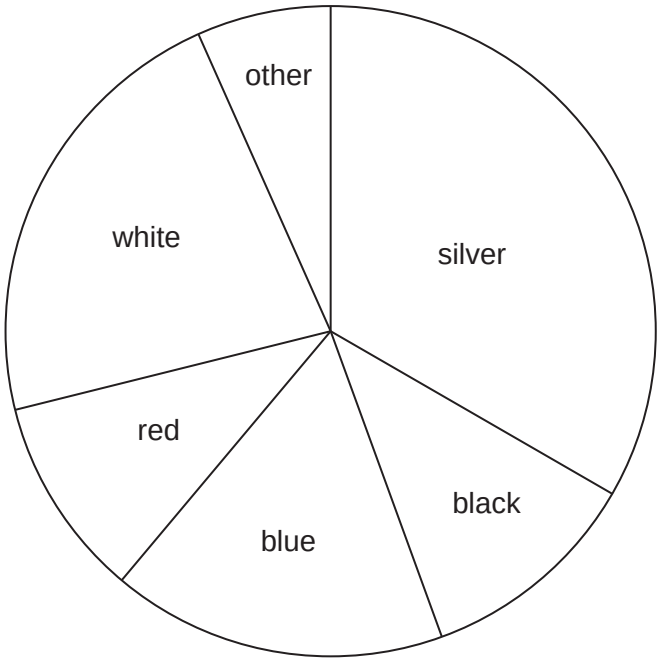
How many cars are in the car park when it is full?

.....

.....

Answer ..... *(3 marks)*

1 **(c)** The pie chart shows information about the colours of the cars in the car park one day.



Complete the sentences.

1 **(c) (i)** There are twice as many ..... cars as black cars.

(1 mark)

1 **(c) (ii)** $\frac{1}{3}$ of the cars are .....

(1 mark)

1 **(d)** Are there any pink cars in the car park on that day?
Tick a box.

☐ Yes ☐ No ☐ Cannot tell

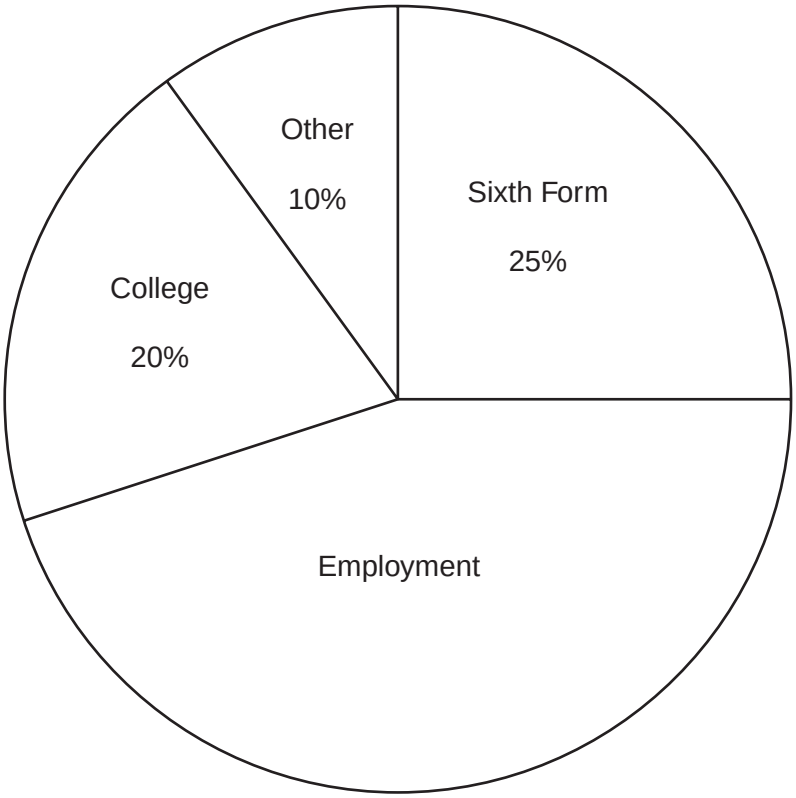
Give a reason for your answer.

.....

.....

(1 mark)

2 **(a)** The pie chart shows the destinations of 300 students from Year 11 in 1979.



2 **(a) (i)** Work out the percentage of the students who went into Employment.

.....

.....

Answer ..... % *(2 marks)*

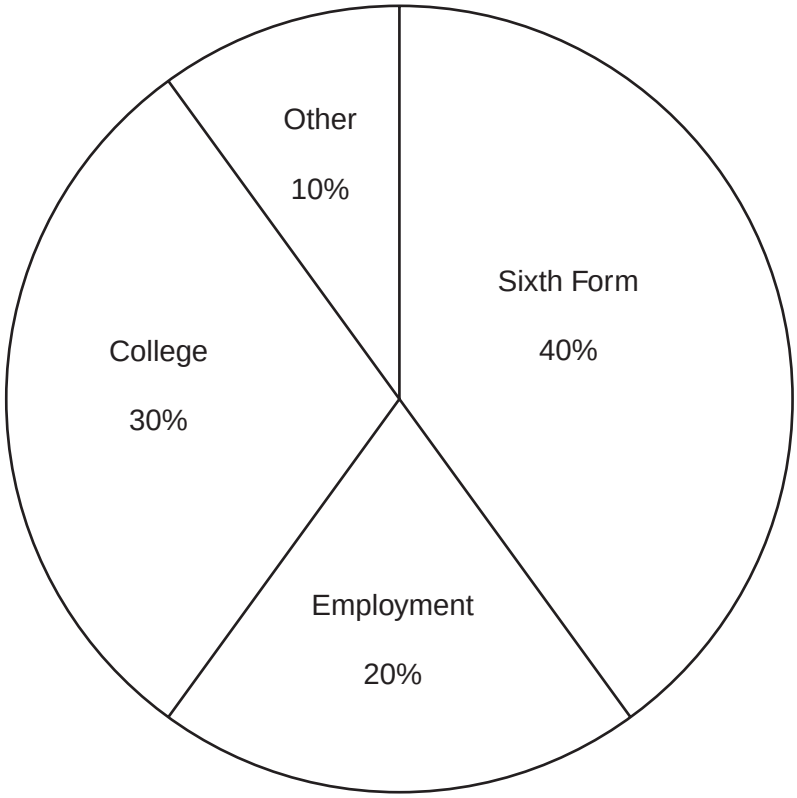
2 **(a) (ii)** Work out the number of students who went to College.

.....

.....

Answer ..... *(2 marks)*

3 **(b)** The pie chart shows the destinations of 300 students from Year 11 in 2009.



3 **(b)** What was the most popular destination in 2009?

Answer ..... *(1 mark)*

3 **(c)** The pie charts show changes in the destinations of the students.

Write down **two** changes that have happened by 2009.

Change 1 .....

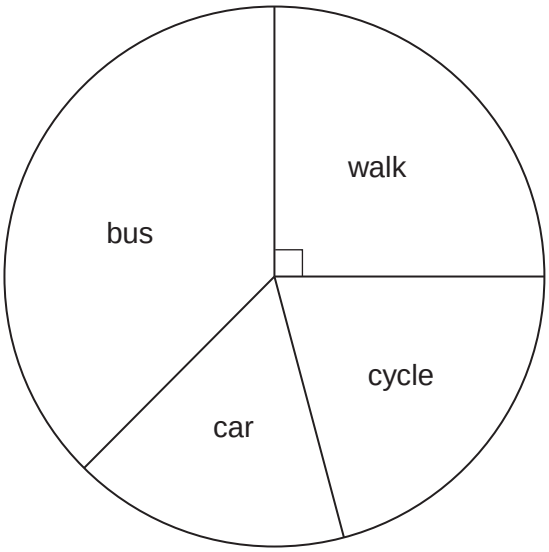
.....

Change 2 .....

.....

(2 marks)

4 The pie chart shows information about how year 9 students travel to a school.



4 (a) A student from year 9 is chosen at random.

Mark, with the letter, the probabilities of each of the following on the scale below.

The first one has been done for you.

A: The student walks to school.

B: The student does **not** walk to school.

C: The student travels to school by train.

(2 marks)

4 (b) 40 students travel to school by car.

How many year 9 students are there?

.....

.....

.....

Answer ..... *(3 marks)*

4 (c) There are 252 students in year 10.

The same proportion of students walk to school as in year 9.

Work out the number of year 10 students that walk to school.

.....

.....

.....

Answer ..... *(2 marks)*

5 The table shows the types of shell that Chris collects.

Type of shell	Number
Mussel	18
Winkle	10
Whelk	8
Razor	4

5 (a) Draw and label a pie chart to represent the data.

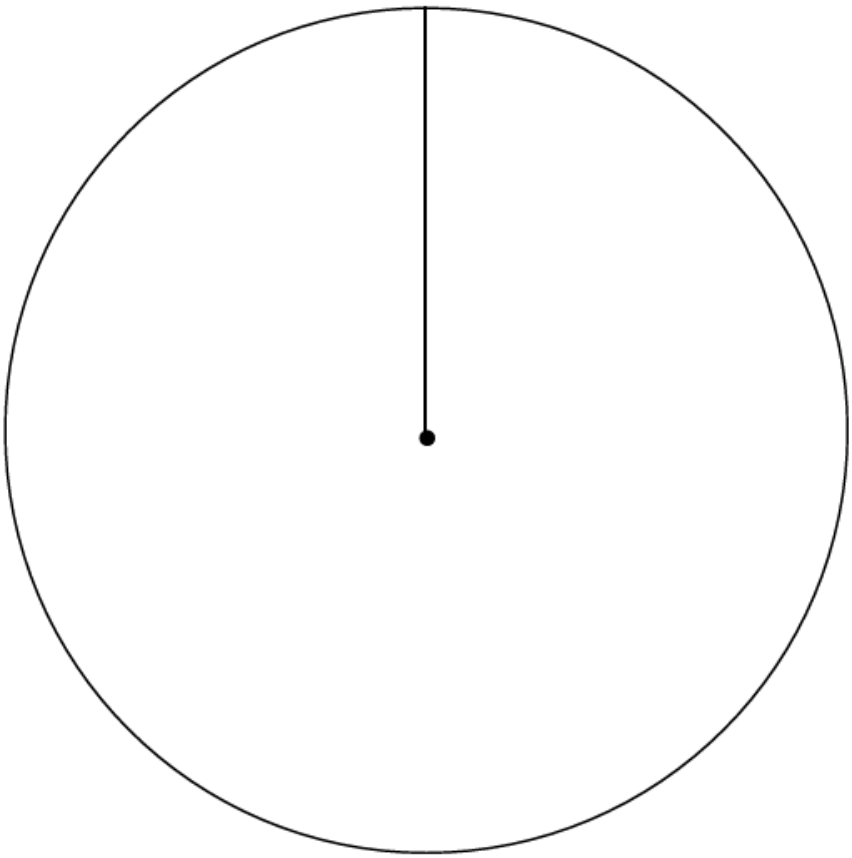
.....

.....

.....

.....

Chris's shells



(4 marks)

5 (b) Sophie collects the same proportion of winkle shells as Chris.

She collects 15 winkle shells.

Work out the number of shells that Sophie collects.

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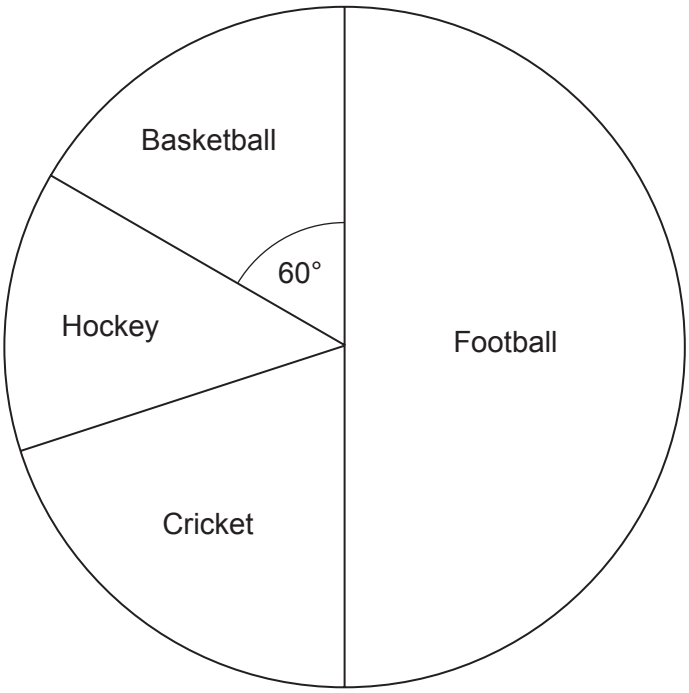
Answer .....

(3 marks)

6 The pie chart shows the sports played by 60 students during their games lesson.



6 (a) How many students play football?

.....

Answer ..... *(1 mark)*

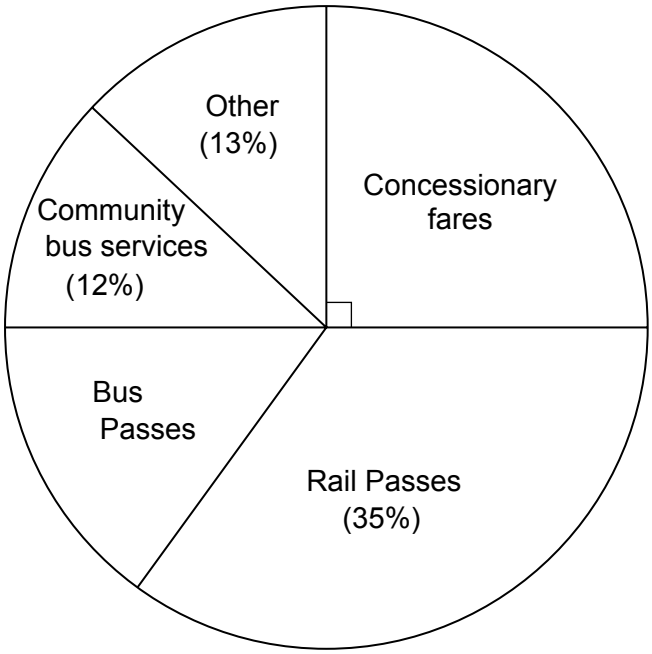
6 (b) How many students play hockey or cricket?

.....

.....

Answer ..... *(3 marks)*

7 The pie chart shows how a council spends money on transport.
Only some of the percentages are given.



7 (a) 25% of the money is spent on Concessionary fares.

Explain how the pie chart shows this.

.....

.....

(1 mark)

7 (b) What percentage of the money is spent on Bus Passes?

.....

.....

Answer ..... % *(2 marks)*

7 (c) The council spends £200 million on transport in total.

Work out 12% of £200 million to find how much the council spends on Community bus services.

.....

.....

.....

.....

Answer £ ..... million *(2 marks)*

8 Misba asks 18 pupils to choose their favourite vegetable from a list.
These are her results.

peas	broccoli	peas	carrots	carrots	broccoli
peas	broccoli	sprouts	carrots	peas	carrots
carrots	peas	carrots	carrots	carrots	broccoli

Misba decides to draw a pie chart to show these results. The table shows some of her work.

Favourite vegetable	Tally	Frequency	Angle on pie chart
Broccoli (B)	|||	3	60°
Peas (P)			
Carrots (C)			
Sprouts (S)			
		Total = 18	Total = 360°

8 (a) Complete the tally and frequency columns in the table.

(2 marks)

8 (b) (i) Complete the angle on the pie chart column in the table.

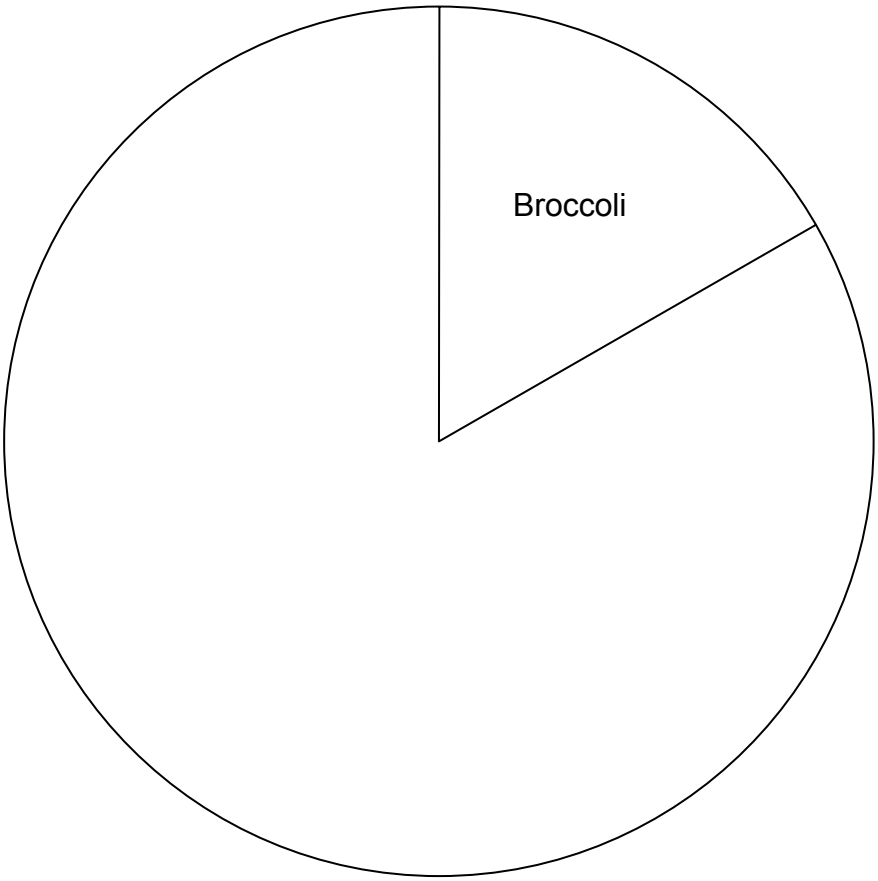
.....

.....

.....

(2 marks)

8 (b) (ii) Complete the pie chart to represent this information.



(2 marks)

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AQA

General Certificate of Secondary Education
Foundation Tier

Mathematics 43601F

Past Paper Questions by Topic

Probability

F

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.

Time allowed
- 1 hour 15 minutes

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
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- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.

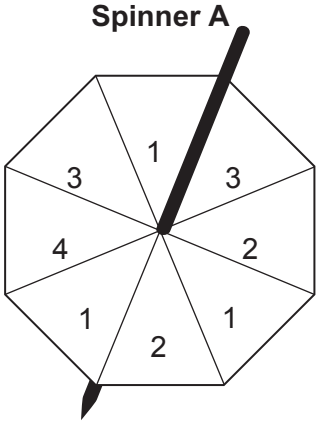
Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is.
- The quality of your written communication is specifically assessed in questions indicated with an asterisk (*)
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1(a) Fair spinner A has eight equal sections.
The sections are either *one* (1), *two* (2), *three* (3) or *four* (4).

Spinner A



1 (a) (i) The spinner is spun.

On which number is it least likely to land?

Answer ..... *(1 mark)*

1 (a) (ii) Write down the probability that the spinner lands on *three*.
Give your answer in its simplest form.

.....

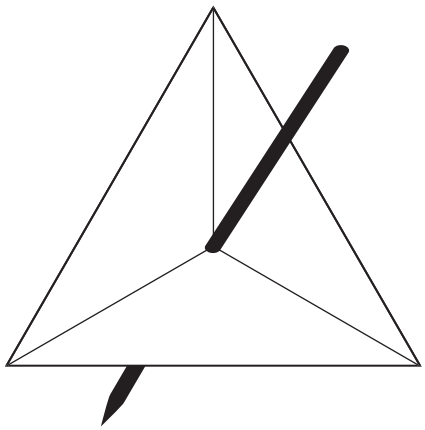
Answer ..... *(2 marks)*

1 (b) Fair spinner B has three equal sections.

It is certain to land on *one* (1).

Label spinner B.

Spinner B



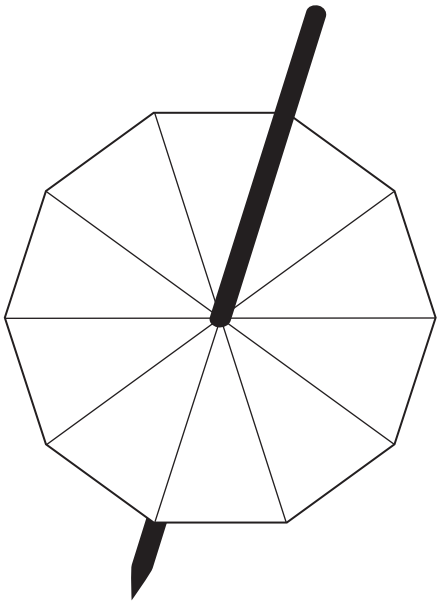
(1 mark)

1 (c) Fair spinner C has 10 equal sections.

Label spinner C so that

it has the same four numbers as spinner A
four is less likely than on spinner A
four and *three* are equally likely on spinner C
one and *two* are equally likely on spinner C.

Spinner C



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(2 marks)

2 There are three drinks.

Cola	C
Orange	O
Water	W

They come in three sizes.

Small	S
Medium	M
Large	L

2 (a) List **all** possible combinations of drink and size. The first one has been done for you.

CS .....

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(3 marks)

2 (b) A drink is chosen at random.

What is the probability that a small cola is chosen?

Answer ..... *(1 mark)*

3 (a) A bag contains 3 red, 5 white and 8 blue balls.

One ball is chosen at random.

What is the probability of choosing a blue ball?

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Answer ..... *(2 marks)*

3 (b) A different bag contains only black balls, pink balls and white balls. When one ball is chosen at random, each colour is equally likely.

Write down **two** possible values for the total number of balls in this bag.

.....

.....

Answer ..... and ..... *(2 marks)*

3 (c) Another bag contains only green balls and yellow balls. There are more than 10 balls in the bag.
When one ball is chosen at random, the probability of choosing a green ball is $\frac{3}{4}$

Write down **two** possible values for the total number of balls in this bag.

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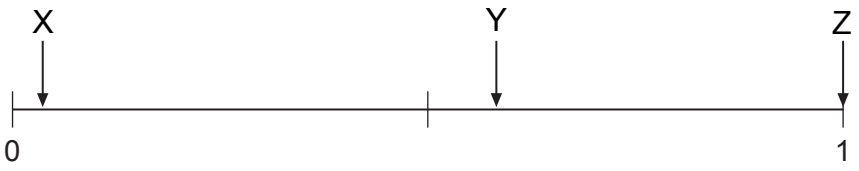
Answer ..... and ..... *(2 marks)*

4 The scale shows the probability that three events A, B and C will happen.



Choose the correct word to complete each statement.

Unlikely	Impossible	Very likely
Certain	Very unlikely	Likely

It is ..... that event X will happen.

It is ..... that event Y will happen.

It is ..... that event Z will happen.

(3 marks)

5 At the school fayre, Hamira plays a game 20 times.
Each go costs 50p.
Each time she wins she receives £1.50
The probability of winning is 0.2.

How much money does she expect to lose?

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Answer £ ..... *(3 marks)*

6 Tara has a box of 1000 coloured bands.
The bands are Red, Blue, Green and Yellow.
The table shows some of the probabilities of choosing a colour.

Colour	Red	Blue	Green	Yellow
Probability	0.6	0.1		0.1

6 (a) Which coloured band is the most common?

Answer ..... *(1 mark)*

6 (b) Tara chooses a band at random from the box.

6 (b) (i) Work out the probability that she chooses a Green band.

.....

.....

Answer ..... *(2 marks)*

6 (b) (ii) Write down the probability that she chooses a White band.

Answer ..... *(1 mark)*

6 (c) Tara says: 'There must be 600 Red bands in the box.'

Is Tara correct?

Tick the correct box.

☐ Yes ☐ No

Give a reason for your answer.

Reason .....

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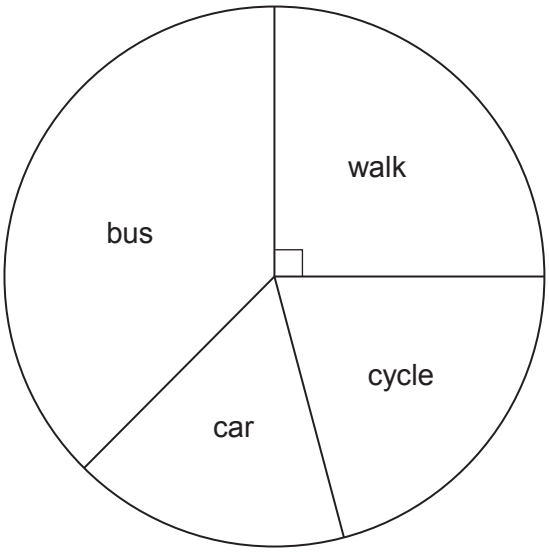
(2 marks)

7 The pie chart shows information about how workers travel to a factory.



7 (a) A worker is chosen at random.

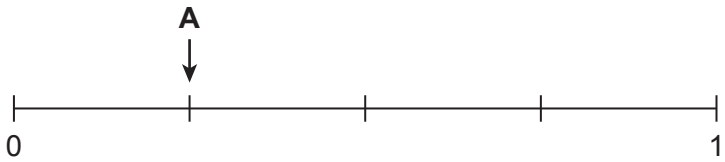
Mark, with the letter, the probabilities of each of the following on the scale below.

The first one has been done for you.

A: The worker walks to the factory.

B: The worker does **not** walk to the factory.

C: The worker travels to the factory by train.



(2 marks)

7 (b) 40 workers travel to the factory by car.

How many workers are there?

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Answer ..... *(3 marks)*

7 (c) There are 252 workers in the warehouse.

The same proportion of workers walk to the warehouse as in the factory

Work out the number of workers that walk to the warehouse.

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Answer ..... *(2 marks)*

8 A box only contains red and black balls.

It contains 24 red balls.

A ball is chosen at random from the box.

The probability of choosing a black ball is $\frac{1}{4}$.

How many balls are in the box?

Answer ..... *(3 marks)*

9 Terry throws two fair dice and adds their scores together.
The table shows some of the possible total scores.

+	1	2	3	4	5	6
1	2	3	4			
2				6	7	8
3						
4						
5	6	7	8			
6				1 0	11	12

9 (a) Complete the table.

(2 marks)

9 (b) What is the probability of scoring a total of 8?

Answer ..... *(1 mark)*

9 (c) What is the probability of scoring a total of 10 or more?

.....

Answer ..... *(2 marks)*

10 Alex is x years old.
David is 3 years younger than Alex.
Will is twice as old as Alex.
The total of their ages is 25

10 (a) Write an expression for David's age in terms of x.

Answer ..... *(1 mark)*

10 (b) Write an expression for Will's age in terms of x.

Answer ..... *(1 mark)*

10 (c) Form an equation in x and use it to work out Alex's age.

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Answer ..... *(2 marks)*

11 Justin has 3 red counters and 7 blue counters.
Terry has 10 red counters.
Chris has only blue counters.

11 (a) Justin puts his counters into a bag.

What is the probability of choosing a red counter from the bag?

Answer ..... *(1 mark)*

11 (b) Terry adds his counters to the bag.

What is the probability of choosing a red counter now?

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Answer ..... *(2 marks)*

11 (c) Chris adds her counters to the bag.
The probability of choosing a red counter now is $\frac{1}{2}$

How many blue counters did Chris have?

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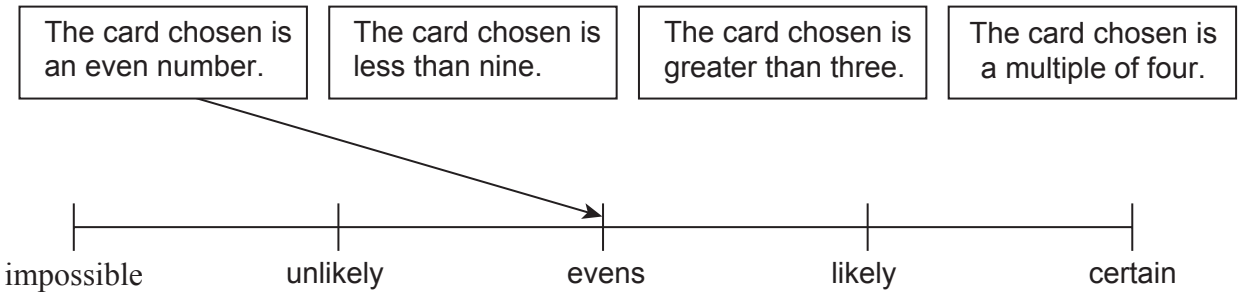
Answer ..... *(2 marks)*

12 Here are some number cards.

1	2	3	4	5	6	7	8

A card is chosen at random.

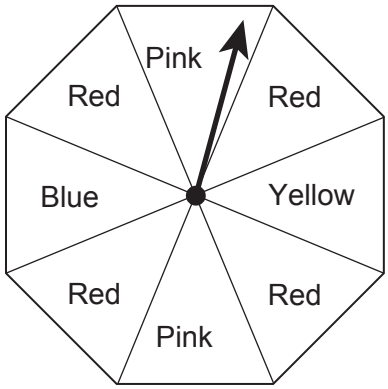
Match each statement to the correct position on the probability scale. The first one has been done for you.



(3 marks)

13` (a) Ron has a spinner with eight sections.
Four of the sections are Red, two are Pink, one is Blue and one is Yellow. He spins the spinner 200 times.
His results are shown in the table.

Colour	Red	Pink	Blue	Yellow
Frequency	105	48	22	25



13̀ (a) (i) Explain why the relative frequency of Pink is 0.24

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(1 mark)

13 (a) (ii) Do the results suggest that the spinner is fair?
Explain your answer.

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(2 marks)

13 (b) Sheila has a spinner with six sections.
Three of the sections are Green, two are White and one is Black. She spins the spinner 10 times.
Her results are shown in a table.

Colour	Green	White	Black
Frequency	2	5	3

She says her spinner is **not** fair.

Explain why Sheila could be wrong.

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(1 mark)

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
TOTAL	

In the style of

AQA

General Certificate of Secondary Education
Higher Tier

Mathematics 43601H

Past Paper Questions by Topic

Probability

H

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.

Time allowed
- 1 hour 15 minutes

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
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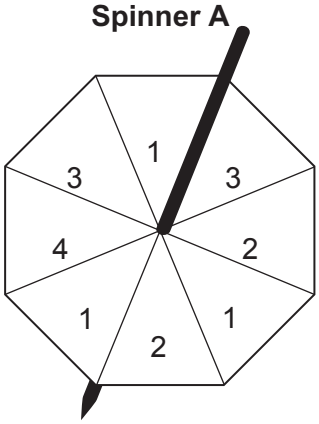
By Peter Bland

1(a) Fair spinner A has eight equal sections.
The sections are either *one* (1), *two* (2), *three* (3) or *four* (4).

Spinner A



1 (a) (i) The spinner is spun.

On which number is it least likely to land?

Answer ..... *(1 mark)*

1 (a) (ii) Write down the probability that the spinner lands on *three*.
Give your answer in its simplest form.

.....

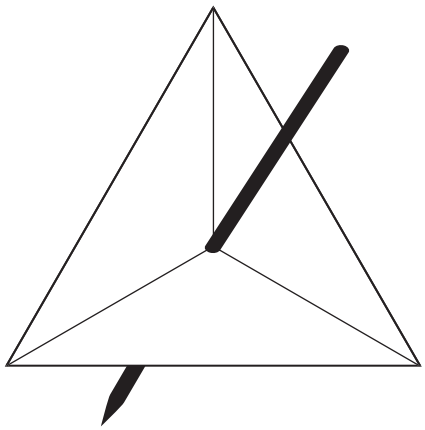
Answer ..... *(2 marks)*

1 (b) Fair spinner B has three equal sections.

It is certain to land on *one* (1).

Label spinner B.

Spinner B



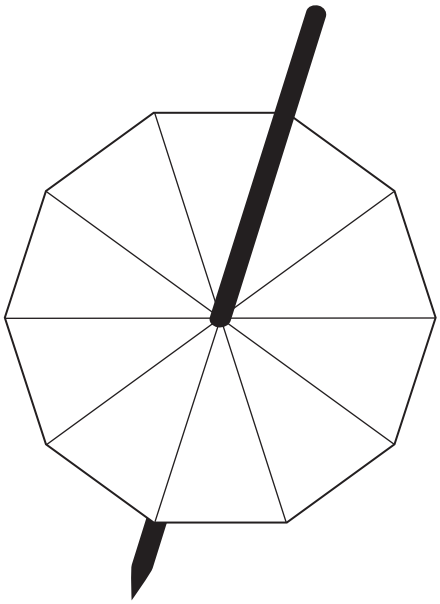
(1 mark)

1 (c) Fair spinner C has 10 equal sections.

Label spinner C so that

it has the same four numbers as spinner A
four is less likely than on spinner A
four and *three* are equally likely on spinner C
one and *two* are equally likely on spinner C.

Spinner C



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(2 marks)

2 There are three drinks.

Cola	C
Orange	O
Water	W

They come in three sizes.

Small	S
Medium	M
Large	L

2 (a) List **all** possible combinations of drink and size. The first one has been done for you.

CS .....

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(3 marks)

2 (b) A drink is chosen at random.

What is the probability that a small cola is chosen?

Answer ..... *(1 mark)*

3 (a) A bag contains 3 red, 5 white and 8 blue balls.

One ball is chosen at random.

What is the probability of choosing a blue ball?

.....

.....

Answer ..... *(2 marks)*

3 (b) A different bag contains only black balls, pink balls and white balls. When one ball is chosen at random, each colour is equally likely.

Write down **two** possible values for the total number of balls in this bag.

.....

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Answer ..... and ..... *(2 marks)*

3 (c) Another bag contains only green balls and yellow balls. There are more than 10 balls in the bag.
When one ball is chosen at random, the probability of choosing a green ball is $\frac{3}{4}$

Write down **two** possible values for the total number of balls in this bag.

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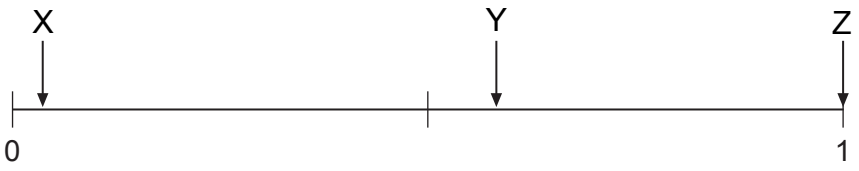
Answer ..... and ..... *(2 marks)*

4 The scale shows the probability that three events A, B and C will happen.



Choose the correct word to complete each statement.

Unlikely	Impossible	Very likely
Certain	Very unlikely	Likely

It is ..... that event X will happen.

It is ..... that event Y will happen.

It is ..... that event Z will happen.

(3 marks)

5 At the school fayre, Hamira plays a game 20 times.
Each go costs 50p.
Each time she wins she receives £1.50
The probability of winning is 0.2.

How much money does she expect to lose?

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Answer £ ..... *(3 marks)*

6 Tara has a box of 1000 coloured bands.
The bands are Red, Blue, Green and Yellow.
The table shows some of the probabilities of choosing a colour.

Colour	Red	Blue	Green	Yellow
Probability	0.6	0.1		0.1

6 (a) Which coloured band is the most common?

Answer ..... *(1 mark)*

6 (b) Tara chooses a band at random from the box.

6 (b) (i) Work out the probability that she chooses a Green band.

.....

.....

Answer ..... *(2 marks)*

6 (b) (ii) Write down the probability that she chooses a White band.

Answer ..... *(1 mark)*

6 (c) Tara says: 'There must be 600 Red bands in the box.'

Is Tara correct?

Tick the correct box.

☐ Yes ☐ No

Give a reason for your answer.

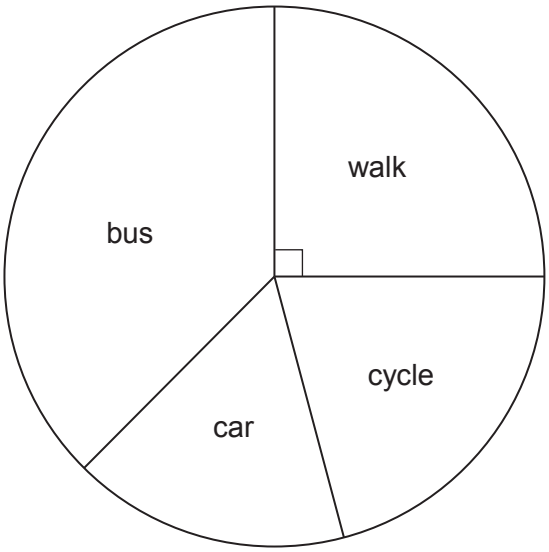
Reason .....

.....

.....

(2 marks)

7 The pie chart shows information about how workers travel to a factory.



7 (a) A worker is chosen at random.

Mark, with the letter, the probabilities of each of the following on the scale below.

The first one has been done for you.

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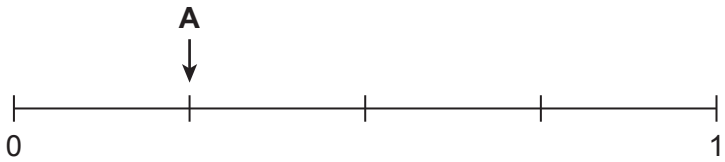
B: The worker does **not** walk to the factory.

C: The worker travels to the factory by train.



(2 marks)

7 (b) 40 workers travel to the factory by car.

How many workers are there?

.....

.....

.....

Answer ..... *(3 marks)*

7 (c) There are 252 workers in the warehouse.

The same proportion of workers walk to the warehouse as in the factory

Work out the number of workers that walk to the warehouse.

.....

.....

.....

Answer ..... *(2 marks)*

8 A box only contains red and black balls.

It contains 24 red balls.

A ball is chosen at random from the box.

The probability of choosing a black ball is $\frac{1}{4}$.

How many balls are in the box?

Answer ..... *(3 marks)*

9 Terry throws two fair dice and adds their scores together.
The table shows some of the possible total scores.

+	1	2	3	4	5	6
1	2	3	4			
2				6	7	8
3						
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6				1 0	11	12

9 (a) Complete the table.

(2 marks)

9 (b) What is the probability of scoring a total of 8?

Answer ..... *(1 mark)*

9 (c) What is the probability of scoring a total of 10 or more?

.....

Answer ..... *(2 marks)*

10 Alex is x years old.
David is 3 years younger than Alex.
Will is twice as old as Alex.
The total of their ages is 25

10 (a) Write an expression for David's age in terms of x.

Answer ..... *(1 mark)*

10 (b) Write an expression for Will's age in terms of x.

Answer ..... *(1 mark)*

10 (c) Form an equation in x and use it to work out Alex's age.

.....

.....

.....

Answer ..... *(2 marks)*

11 Justin has 3 red counters and 7 blue counters.
Terry has 10 red counters.
Chris has only blue counters.

11 (a) Justin puts his counters into a bag.

What is the probability of choosing a red counter from the bag?

Answer ..... *(1 mark)*

11 (b) Terry adds his counters to the bag.

What is the probability of choosing a red counter now?

.....

Answer ..... *(2 marks)*

11 (c) Chris adds her counters to the bag.
The probability of choosing a red counter now is $\frac{1}{2}$

How many blue counters did Chris have?

.....

.....

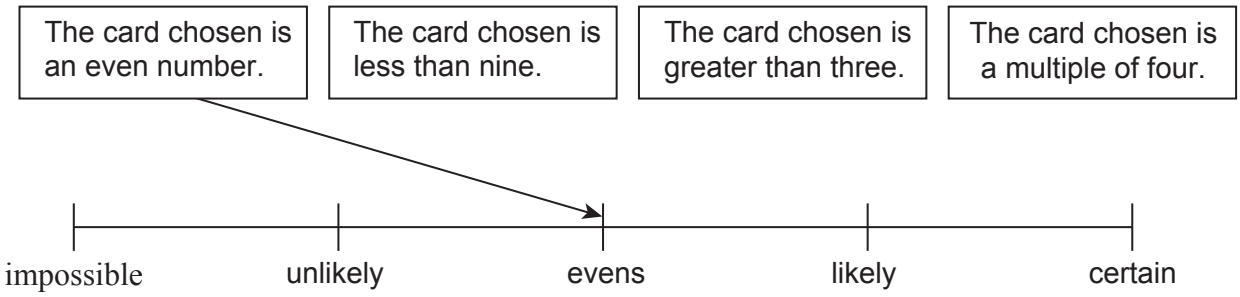
Answer ..... *(2 marks)*

12 Here are some number cards.

1	2	3	4	5	6	7	8

A card is chosen at random.

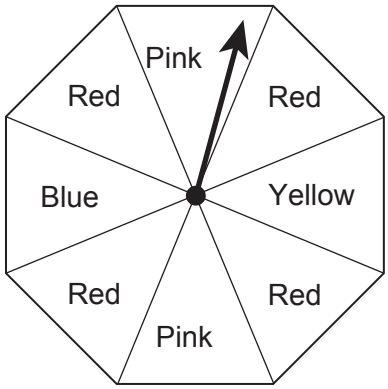
Match each statement to the correct position on the probability scale. The first one has been done for you.



(3 marks)

13` (a) Ron has a spinner with eight sections.
Four of the sections are Red, two are Pink, one is Blue and one is Yellow. He spins the spinner 200 times.
His results are shown in the table.

Colour	Red	Pink	Blue	Yellow
Frequency	105	48	22	25



13̀ (a) (i) Explain why the relative frequency of Pink is 0.24

.....

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(1 mark)

13 (a) (ii) Do the results suggest that the spinner is fair?
Explain your answer.

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.....

(2 marks)

13 (b) Sheila has a spinner with six sections.
Three of the sections are Green, two are White and one is Black. She spins the spinner 10 times.
Her results are shown in a table.

Colour	Green	White	Black
Frequency	2	5	3

She says her spinner is **not** fair.

Explain why Sheila could be wrong.

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(1 mark)

14 A box only contains black balls and red balls. A ball is chosen from the box at random and replaced. Another ball is then chosen from the box at random. The probability of choosing two black balls is 0.36

14 (a) Show that the probability of choosing a black ball each time is 0.6

(1 mark)

14 (b) Work out the probability of choosing two red balls.

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Answer ..... *(2 marks)*

14 (c) Work out the probability of choosing at least one red ball.

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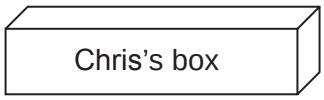
Answer ..... *(2 marks)*

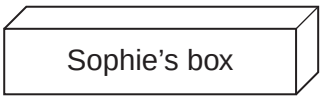
15 Chris picks a sweet at random from a box.
All the sweets in the box are identically wrapped.
The probability that she picks a caramel is $\frac{5}{8}$

Sophie picks a sweet at random from a different box. All the chocolates in Sophie's box are identically wrapped.
The probability that she picks a caramel is denoted by p.

The probability that **both** Chris and Sophie pick a caramel is $\frac{1}{4}$



P (Chris picks a caramel) = $\frac{5}{8}$



P (Sophie picks a caramel) = p

15 (a) Work out the value of p.

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Answer ..... *(2 marks)*

15 (b) Calculate the probability that **neither** Chris **nor** Sophie picks a caramel.

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Answer ..... *(2 marks)*

16 Tom and Harry go fishing together.

The probability that Tom catches a fish is 0.7
The probability that Harry catches a fish is 0.4

They go fishing again.

What is the probability that **exactly one** of them catches a fish? You **must** show your working.

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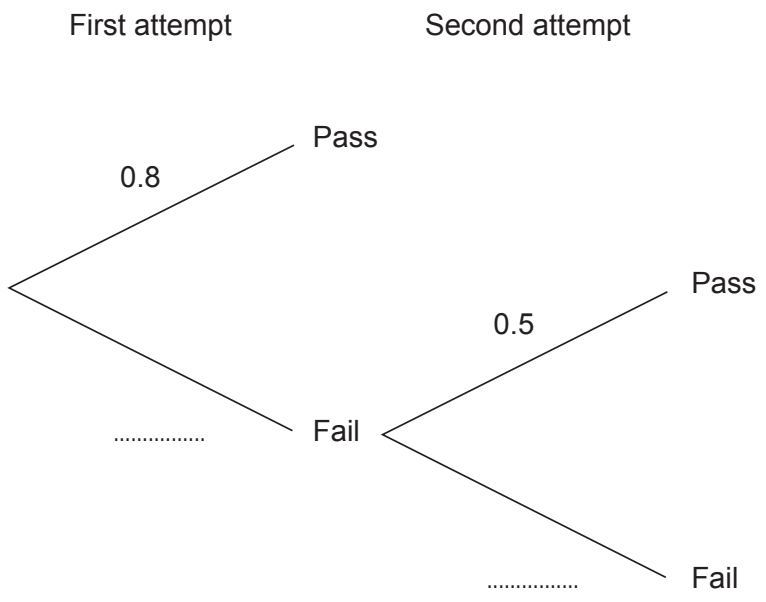
Answer ..... *(4 marks)*

17 After a course of driving lessons candidates must take a test to get a driving licence.
The probability of passing the test at the first attempt is 0.8
Those who fail can re-take the test.
The probability of passing the re-sit is 0.5

17(a) (i) Complete the tree diagram, which shows all the possible outcomes.



(1 mark)

17 (a) (ii) What is the probability that a candidate fails both attempts?

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Answer ..... *(2 marks)*

17 (b) What is the probability that a candidate passes the course?

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Answer ..... *(1 mark)*

17 (c) Hassan and Shagufta both take the driving lessons course.
What is the probability that one of them passes and one of them fails?

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Answer ..... *(3 marks)*

18 Nikki buys a pack of ten eggs.

Seven of the eggs are brown, three are white. An egg is taken at random.
A second egg is taken at random.

Calculate the probability that the two eggs will be **at least one** white egg.

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Answer ..... *(3 marks)*

19* In a game, players try to win a coloured card. There are six possible colours.
The table shows the probability of winning each colour.

Colour of Card	Probability
Yellow	0.04
Green	0.07
Brown	0.09
Blue	0.10
Pink	0.13
Black	0.14

19 (a) Which colour is twice as likely to be won as green?

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Answer ..... *(1 mark)*

19 (b) Work out the probability of winning yellow or brown.

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Answer ..... *(2 marks)*

19 (c) Haziq plays the game 160 times.

Estimate the number of times that he does **not** win.

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Answer ..... *(4 marks)*

20 The town of Knutsford had an election.
The probability a vote was given to a particular party is shown.
One value is missing.

Party	Probability
Conservative	0.41
Labour	0.24
Liberals	0.22
UKIP	
BNP	0.04

20 (a) Complete the table.

.....

.....

(2 marks)

20 (b) Write Labour votes to Liberals votes as a ratio. Give your answer in its simplest form.

.....

.....

Answer ..... : ..... *(2 marks)*

20 (c) There are 15 000 people in the town.
8000 voted.

How many people in the town did **not** vote Conservative?

.....

.....

.....

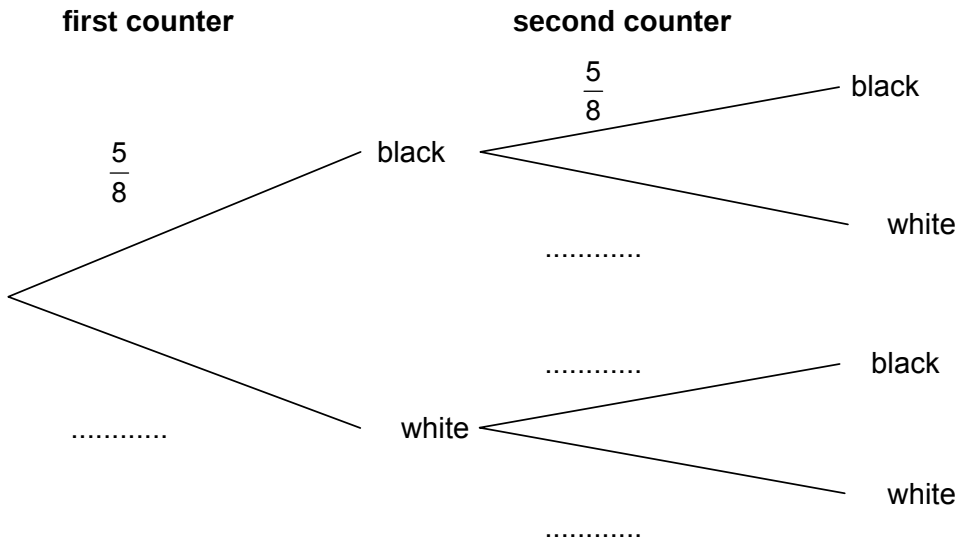
Answer ..... *(3 marks)*

21 A bag contains 5 black and 3 white counters.

A counter is taken from the bag at random and replaced.

Another counter is then taken from the bag at random.

21 (a) Complete the tree diagram.



(1 mark)

21 (b) What is the probability that both counters are white?

.....

.....

Answer ..... *(2 marks)*

21 (c) Some more black counters are added to the 5 black and 3 white counters in the bag.

A counter is taken from the bag at random and replaced.

Another counter is then taken from the bag at random.

The probability that both counters are white is now $\frac{1}{25}$.

How many black balls were added to the bag?

.....

.....

.....

.....

Answer ..... *(3 marks)*

22 Altrincham has the same number of people as Bury.

In Altrincham there are 95 males for every 100 females.
In Bury there are 105 males for every 100 females.

22 (a) Work out the ratio of males in Altrincham to females in Altrincham.
Give your answer in its simplest form.

.....

.....

Answer ..... *(2 marks)*

22 (b) Which town has more females?
Show how you decide.

.....

.....

(1 mark)

23 Mizba tossed a coin 100 times.
Heads appears 61 times.

23 (a) The same coin is tossed once more.

23 (a) (i) If the coin is fair, write down the probability that it lands on heads.

Answer ..... *(1 mark)*

23 (a) (ii) If the coin is biased, estimate the probability that the coin lands on heads.

Answer ..... *(1 mark)*

23 (b) Do you think the coin is fair?
Tick a box.

☐ Yes ☐ Don't know ☐ No

Give a reason for your answer.

.....

.....

.....

(2 marks)

There are no questions printed on this page

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6 – 7	
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In the style of AQA

General Certificate of Secondary Education
Foundation Tier

Mathematics 43602F

Past Paper Type Questions by Topic

Sequences

F

For this paper you must have:
- a calculator
- mathematical instruments.

Time allowed
- 1 hour

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
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Information
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- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1 Write down the next term in each sequence.

1 (a)(i) 5 8 11 14 .....

.....

(1 mark)

1 (a)(ii) 6 4 2 0 .....

.....

(1 mark)

1 (a)(iii) 2 4 8 16 .....

.....

(1 mark)

1 (b) The numbers in this sequence increase by the same amount each time.

11 35

What are the missing numbers?

.....

Answer……and…….

(2 marks)

2 The nth term of a sequence is $100 - 3n$.

2 (a) Work out the first three terms.

.....

.....

.....

Answer .....,.....,.....

(2 marks)

2 (b) Work out the first term of the sequence that is a minus number.

.....

.....

Answer .....

(2 marks)

3 (a) Here are the first three terms of a sequence.

20 12 8 ....

The term to term rule for working out the next term in the sequence is

Add 4 to the previous term and then divide by 2

Work out the first term that is **not** a whole number.

.....

.....

Answer .....

(2 marks)

3 (b) This sequence uses the same rule.

Add 4 to the previous term and then divide by 2

The third term of this sequence is 9.

.... 9 ....

Work out the first term.

.....

.....

.....

.....

Answer ..... *(3 marks)*

4 (a) Write down the next term in each of these sequences.

4 (a) (i) 3 8 13 18 .....

.....

(1 mark)

4 (a) (ii) 5.1 5.3 5.5 5.7 .....

.....

(1 mark)

4 (a) (iii) 2 –1 –4 –7 .....

.....

(1 mark)

4 (b) Here is another sequence.
The third term is 20 and the fourth term is 36.

…… …… 20 36 ……

The term to term rule for this sequence is

Double and subtract four

Work out the first term of the sequence.

.....

.....

.....

Answer ..... *(2 marks)*

5 (a) The numbers in this sequence go down by the same amount each time.

74 …… 58 50 42 ……

Work out the **two** missing numbers.

.....

Answer ..... and ..... *(2 marks)*

5 (b) The numbers in this different sequence go down by the same amount each time.

26 …… …… …… 6

What are the **three** missing numbers?

.....

.....

.....

.....

Answer ..... , ... , ... *(2 marks)*

6 (a) Here are the first two terms of a sequence.

5 4 …… …… ……

The term to term rule for finding the next term in the sequence is

Multiply the previous term by 2 and subtract 6

Work out the first negative term of the sequence.

.....

.....

Answer ..... *(2 marks)*

6 (b) Here are the first three terms of another sequence.

1 4 7 …… …… ……

Which of the following is the nth term for this sequence?
Circle the correct answer.

.....

.....

.....

$n + 3$ $3n + 1$ $3n - 2$ $3n + 2$

(1 mark)

7 (a) A sequence starts

49 46 43 40

7 (a) (i) Write down the next two terms.

Answer ..... and .... *(2 marks)*

7 (a) (ii) What is the rule for continuing the sequence?

Answer ..... *(1 mark)*

7 (b) Another sequence starts

57 50 43 36

This sequence is continued.

What is the first negative number in this sequence?

.....

.....

Answer ..... *(1 mark)*

7 (c) The first sequence is also continued.
The two sequences have the number 43 in common.

What is the next number that the two sequences have in common?

.....

.....

Answer ..... *(2 marks)*

8 (a) Here are the first two terms of a sequence.

5 4 …… ……

The term to term rule for finding the next term in the sequence is

Multiply the previous term by 2 and subtract 6

Work out the first negative term of the sequence.

.....

.....

Answer ..... *(2 marks)*

8 (b) Here are the first three terms of another sequence.

4 7 10 …… ……

Which of the following is the nth term for this sequence?

Circle the correct answer.

.....

.....

.....

$n + 3$ $3n + 1$ $3n - 2$ $3n + 2$ *(1 mark)*

There are no questions printed on this page

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In the style of AQA

General Certificate of Secondary Education
Higher Tier

Mathematics 43602H

Past Paper Type Questions by Topic

Sequences

H

For this paper you must have:
- a calculator
- mathematical instruments.

Time allowed
- 1 hour

Instructions
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Advice
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By Peter Bland

1 Write down the next term in each sequence.

1 (a)(i) 5 8 11 14 .....

.....

(1 mark)

1 (a)(ii) 6 4 2 0 .....

.....

(1 mark)

1 (a)(iii) 2 4 8 16 .....

.....

(1 mark)

1 (b) The numbers in this sequence increase by the same amount each time.

11 35

What are the missing numbers?

.....

Answer……and…….

(2 marks)

2 The nth term of a sequence is $100 - 3n$.

2 (a) Work out the first three terms.

.....

.....

.....

Answer .....,.....,.....

(2 marks)

2 (b) Work out the first term of the sequence that is negative.

.....

.....

Answer .....

(2 marks)

3 (a) Here are the first three terms of a sequence.

20 12 8 ....

The rule for working out the next term in the sequence is

Add 4 to the previous term and then divide by 2

Work out the first term that is **not** a whole number.

.....

.....

Answer .....

(2 marks)

3 (b) This sequence uses the same rule.

Add 4 to the previous term and then divide by 2

The third term of this sequence is 9.

.... 9 ....

Work out the first term.

.....

.....

.....

.....

Answer ..... *(3 marks)*

4 (a) Write down the next term of each sequence.

4 (a) (i) 3 8 13 18 .....

.....

(1 mark)

4 (a) (ii) 5.1 5.3 5.5 5.7 .....

.....

(1 mark)

4 (a) (iii) 2 –1 –4 –7 .....

.....

(1 mark)

4 (b) Here is a different sequence.
The third term is 20 and the fourth term is 36.

…… …… 20 36 ……

The term to term rule for this sequence is

Double and subtract four

Work out the first term of the sequence.

.....

.....

.....

Answer ..... *(2 marks)*

5 (a) The numbers in this sequence decrease by the same amount each time.

74 …… 58 50 42 ……

What are the **two** missing numbers?

.....

Answer ..... and ..... *(2 marks)*

5 (b) The numbers in this different sequence decrease by the same amount each time.

26 …… …… …… 6

What are the **three** missing numbers?

.....

.....

.....

.....

Answer ..... , ... , ... *(2 marks)*

6 (a) Here are the first two terms of a sequence.

5 4 …… …… ……

The rule for finding the next term in the sequence is

Multiply the previous term by 2 and subtract 6

Work out the first negative term of the sequence.

.....

.....

Answer ..... *(2 marks)*

6 (b) Here are the first three terms of another sequence.

1 4 7 …… …… ……

Which of the following is the nth term for this sequence?
Circle the correct answer.

.....

.....

.....

$n + 3$ $3n + 1$ $3n - 2$ $3n + 2$

(1 mark)

7 (a) A sequence starts

49 46 43 40

7 (a) (i) Write down the next two terms.

Answer ..... and .... *(2 marks)*

7 (a) (ii) What is the rule for continuing the sequence?

Answer ..... *(1 mark)*

7 (b) Another sequence starts

57 50 43 36

This sequence is continued.

What is the first negative number in this sequence?

.....

.....

Answer ..... *(1 mark)*

7 (c) The first sequence is also continued.
The two sequences have the number 43 in common.

What is the next number that the two sequences have in common?

.....

.....

Answer ..... *(2 marks)*

8 (a) Here are the first two terms of a sequence.

5 4 …… ……

The rule for finding the next term in the sequence is Multiply the previous term by 2 and subtract 6

Work out the first negative term of the sequence.

.....

.....

Answer ..... *(2 marks)*

8 (b) Here are the first three terms of another sequence.

1 4 7 …… ……

Which of the following is the nth term for this sequence?
Circle the correct answer.

.....

.....

.....

(1 mark)

$n + 3$ $3n + 1$ $3n - 2$ $3n + 2$

***9** The rule for finding the next term in a sequence is

Subtract x and then multiply by 4

The second term is 12.
The third term is 52.

…. 12 52 ….

Work out the first term of the sequence.

.....

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Answer ..... *(4 marks)*

10 The nth term of a sequence is $n^2 + 50$

10 (a) Work out the first three terms of the sequence.

.....

.....

Answer 1st term ..... 2nd term ..... 3rd term ..... *(2 marks)*

10 (b) How many terms in the sequence are less than 100?

.....

.....

.....

Answer ..... *(2 marks)*

***11** The first three terms of a sequence are

$x \qquad y \qquad z \qquad \ldots\ldots$

The term-to-term rule of the sequence is

Multiply by 2 and subtract 4

Show that $z = 4(x - 3)$

.....

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(4 marks)

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In the style of

General Certificate of Secondary Education
Foundation Tier

Mathematics 43601F

Past Paper Questions by Topic

Shapes

F

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.

Time allowed
- 1 hour 15 minutes

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
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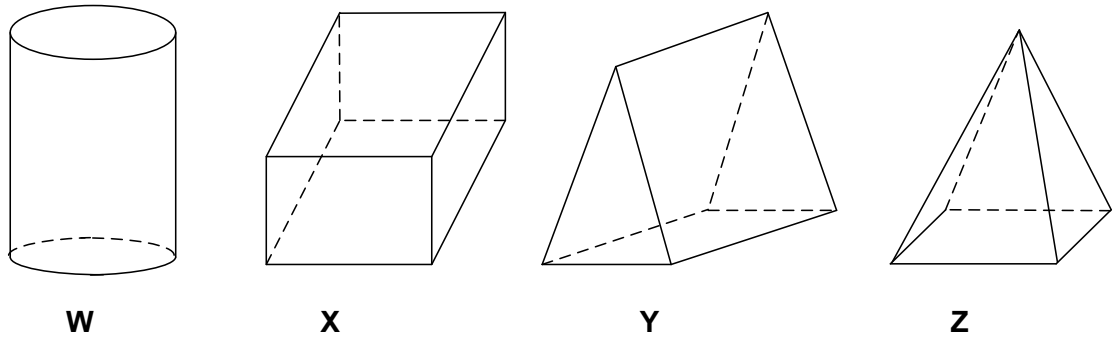
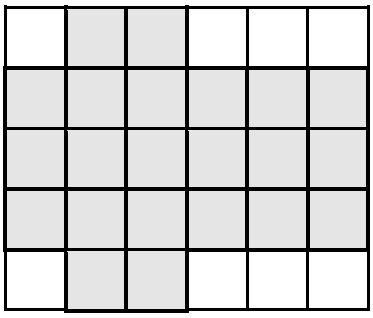
Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1 (a) Here are four 3D shapes.



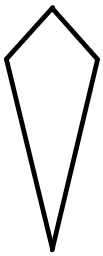
The shaded area is a net for one of them.



Which shape is it?

Answer ..... (*1 mark*)

1 (b) Write down the mathematical name of each of the following.



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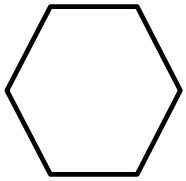

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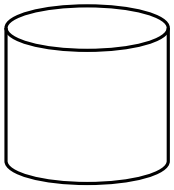
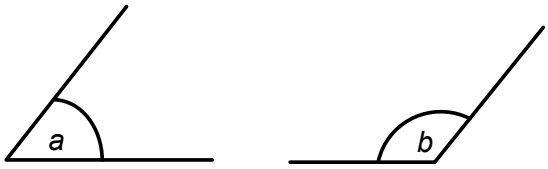


.....

(*3 marks*)

2 Here are two angles, *a* and *b.*

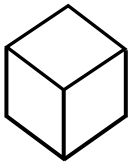


What type of angles are they?

Answer *a* is.....

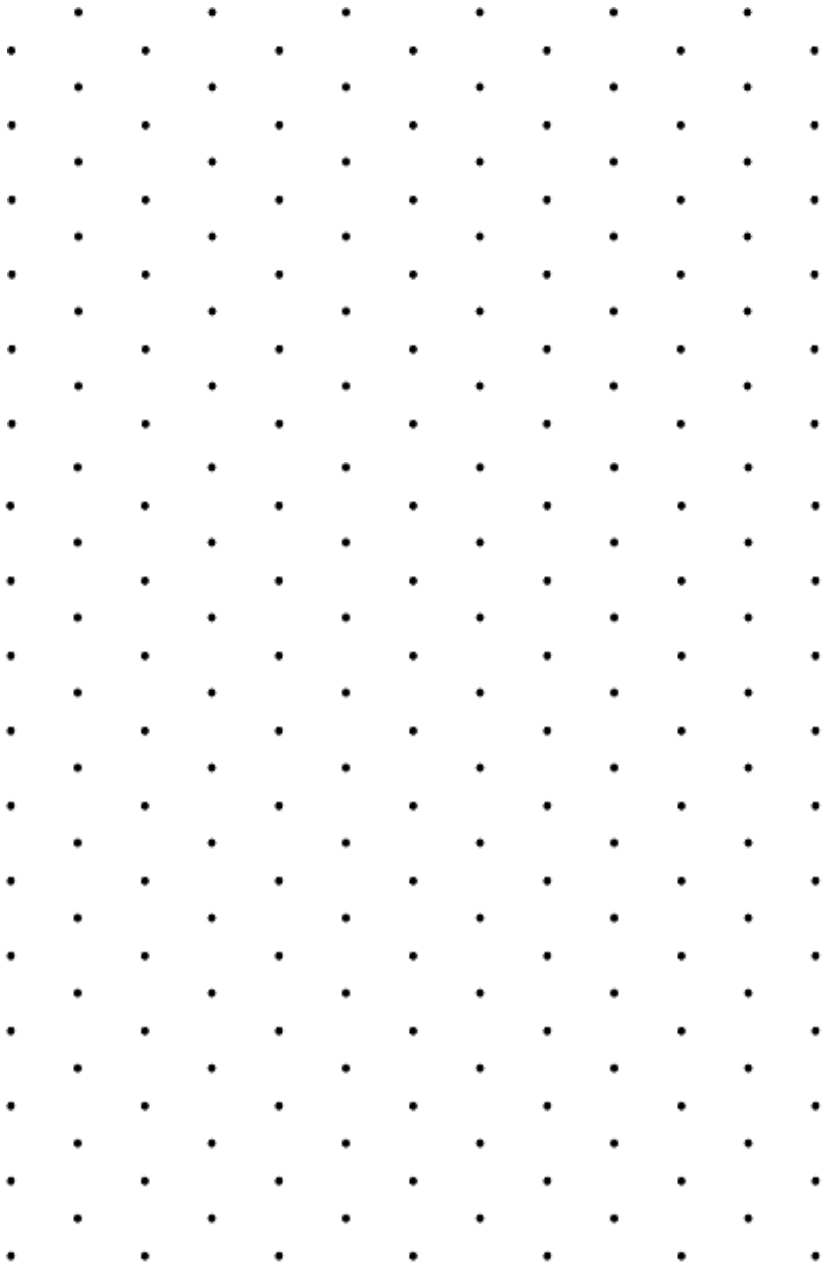
b is ..... (*2 marks*)

3 Here is a centimetre cube.



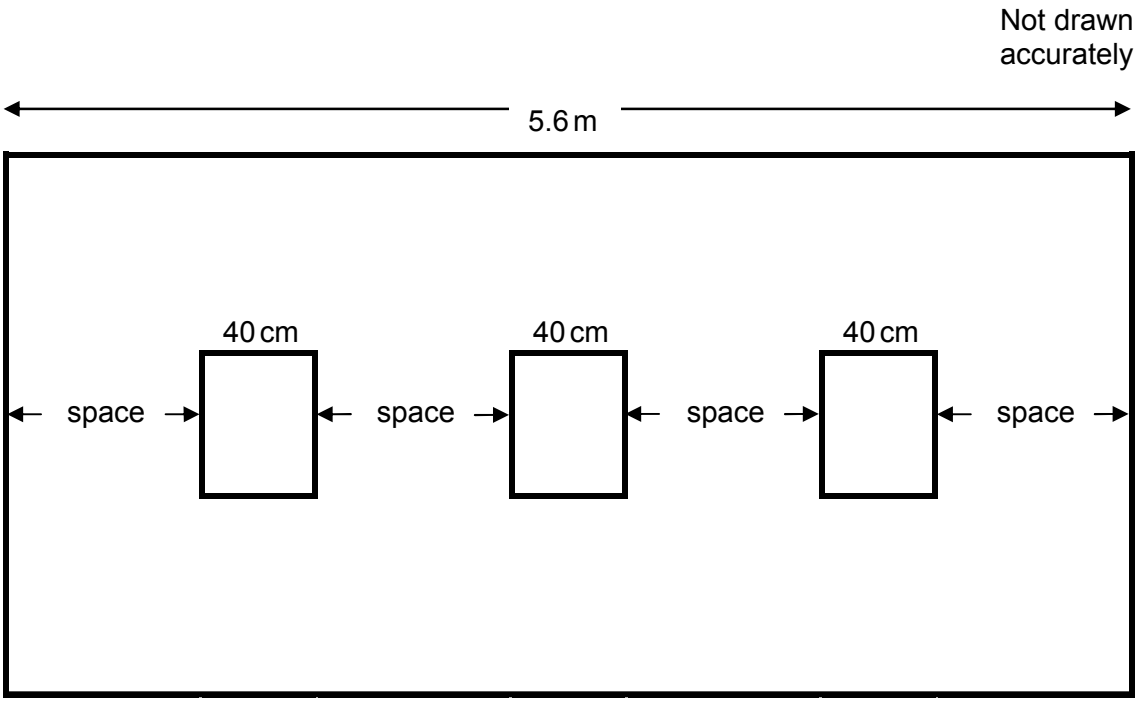
30 of these cubes are used to make a cuboid.

Draw a possible cuboid on the grid below.



(*3 marks*)

4 Rebecca wants to put three equal-sized pictures on a wall as shown.



Each space is the same width.

How wide is each space?

State the units of your answer.

.....

.....

.....

.....

.....

.....

Answer ..... (*6 marks*)

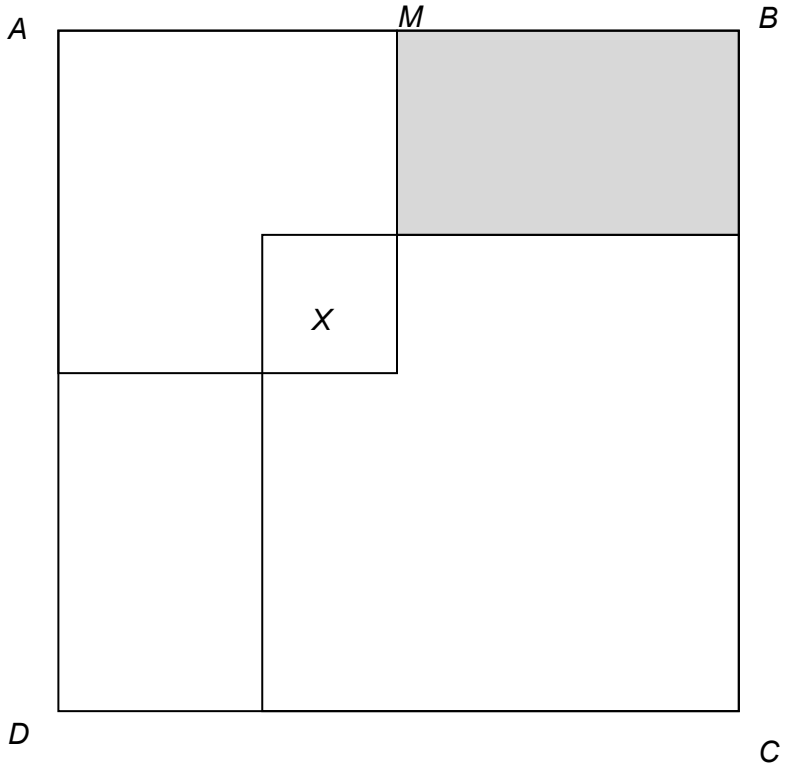
5 *ABCD* is a square of side length 14 cm.

M is the midpoint of *AB*.

Two squares are drawn inside *ABCD* that overlap to form square *X*.

The area of the shaded rectangle is $\frac{1}{7}$ of the area of *ABCD*

Not drawn accurately



Work out the area of square *X*.

.....

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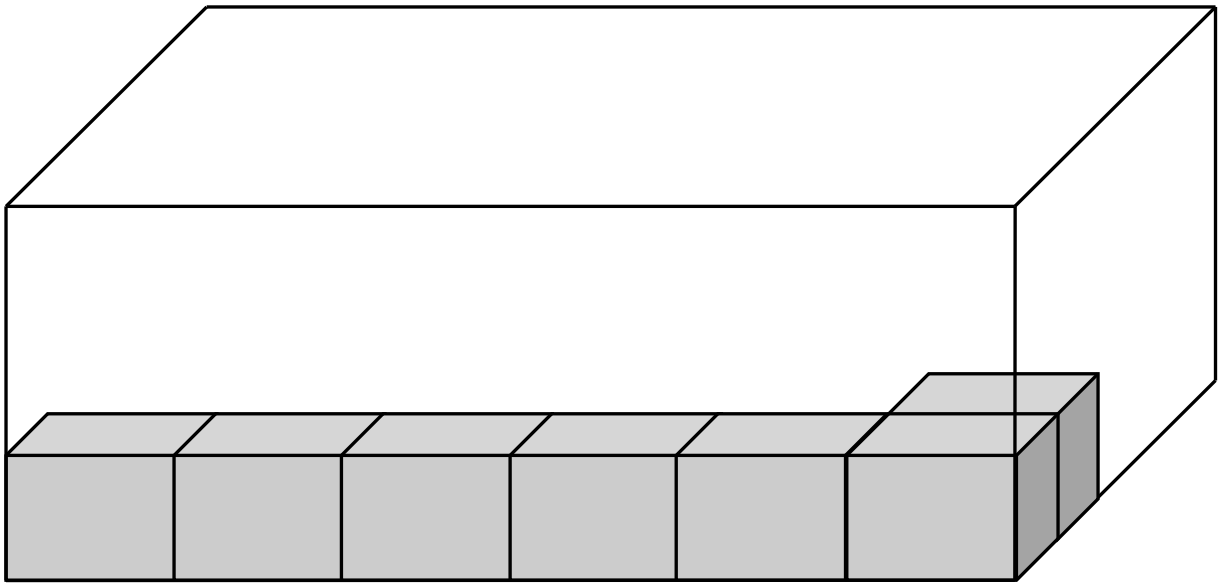
Answer ..... cm^2 (*5 marks*)

6 Tara is packing her centimetre cubes into the box.

Not drawn accurately



Each layer of cubes is 6 cubes long and 5 cubes wide.
There are 3 layers in the box.

Tara fills the box.
How many cubes does she have?

.....

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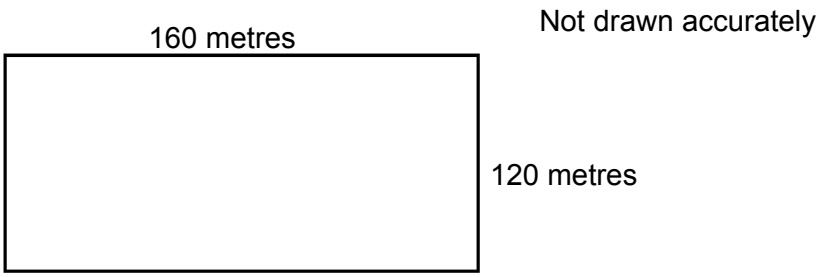
Answer ..... (*5 marks*)

7 The diagram shows a Ron's field.



The field is to be divided into three rectangular areas. One-quarter of the field is for Wheat.

7 (a) Work out the length and width of a rectangle he could use for wheat.

.....

.....

Length.....metres

Width.....metres (*2 marks*)

7 (b) Two-fifths of the field is for potatoes.
The rest is **not** used.

What fraction of the field is **not** used for wheat or potatoes?

.....

.....

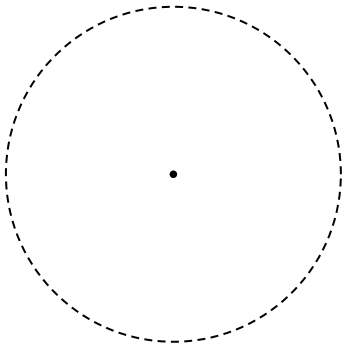
.....

.....

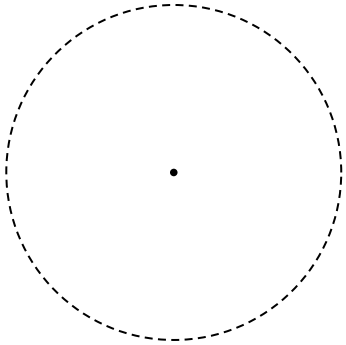
Answer ..... (*3 marks*)

8 (a) On the circles, draw

a diameter

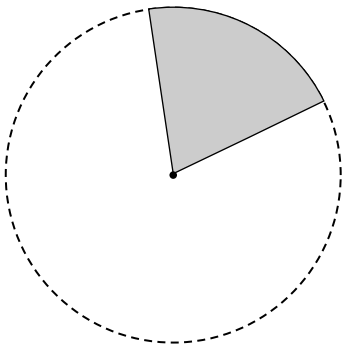


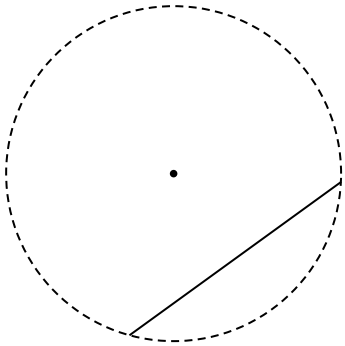
an arc



(2 marks)

8 (b) Complete the sentences.



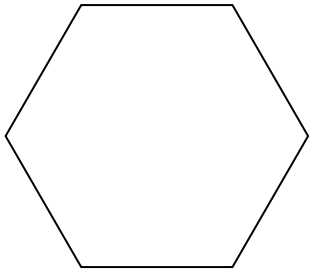


The shaded area is a .....

The straight line is a .....

(2 marks)

9 (a) The diagram shows a regular hexagon.



9 (a) (i) By measuring the length of one side, work out the perimeter.

.....

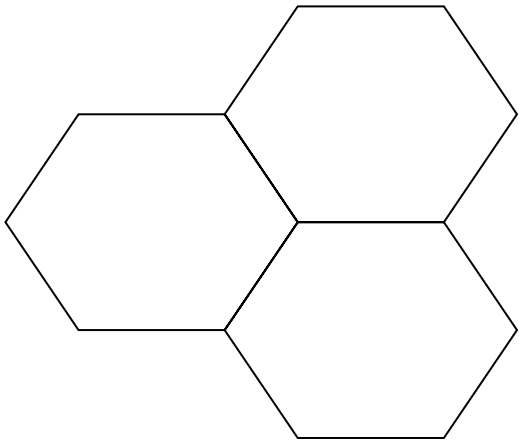
.....

Answer ..... cm *(2 marks)*

9 (a) (ii) On the diagram above draw in all the lines of symmetry.

(2 marks)

9 (b) Three regular hexagons are joined together as shown.



Not drawn accurately

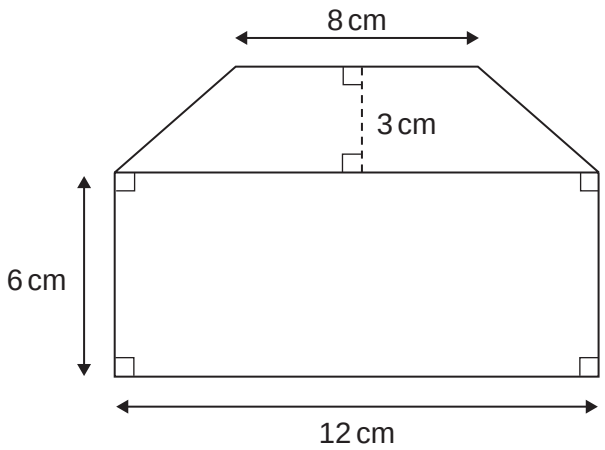
Work out the size of an interior angle of a regular hexagon.
You must show your working.

.....

.....

Answer ..... degrees *(2 marks)*

10 The shape is a drawing of a dolls house.



Not drawn accurately

Work out the area of this shape.
State the units of your answer.

.....

.....

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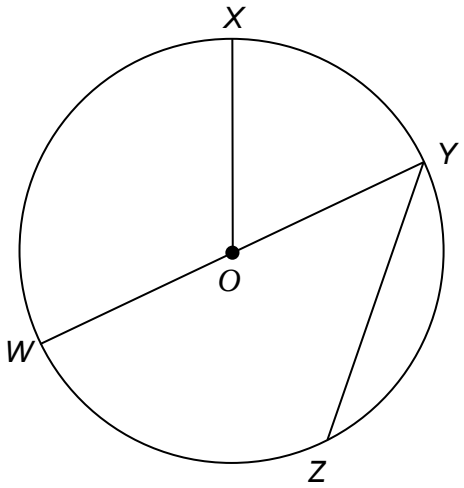
Answer ..... *(4 marks)*

11 *W*, *X*, *Y* and *Z* are four points on a circle centre *O*.



11 (a) Here are five words that are used with circles.

circumference **radius** **chord** **diameter** **sector**

Use **one** of these words to complete the following sentences.

11 (a) (i) The straight line *WY* is a ..... of the circle.

(1 mark)

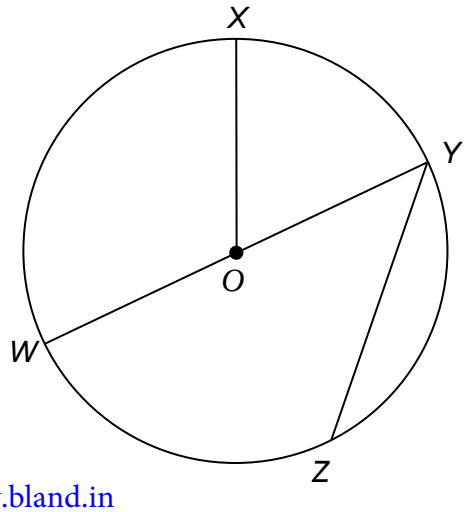
11 (a) (ii) The straight line *YZ* is a ..... of the circle.

(1 mark)

11 (a) (iii) The straight line *OX* is a ..... of the circle.

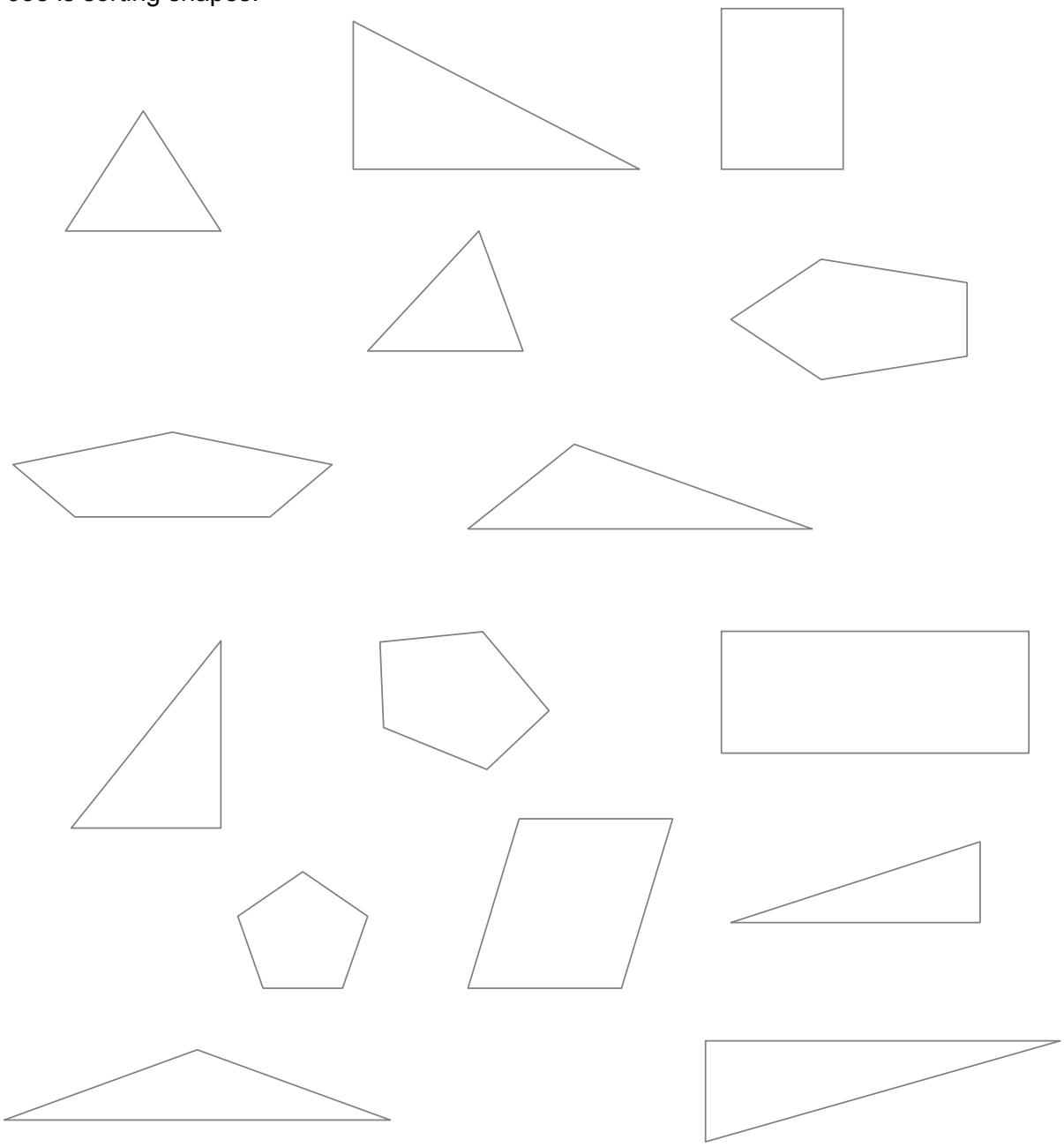
(1 mark)

11 (b) On the diagram below draw a tangent to the circle at point *W*.



(1 mark)

12* Joe is sorting shapes.

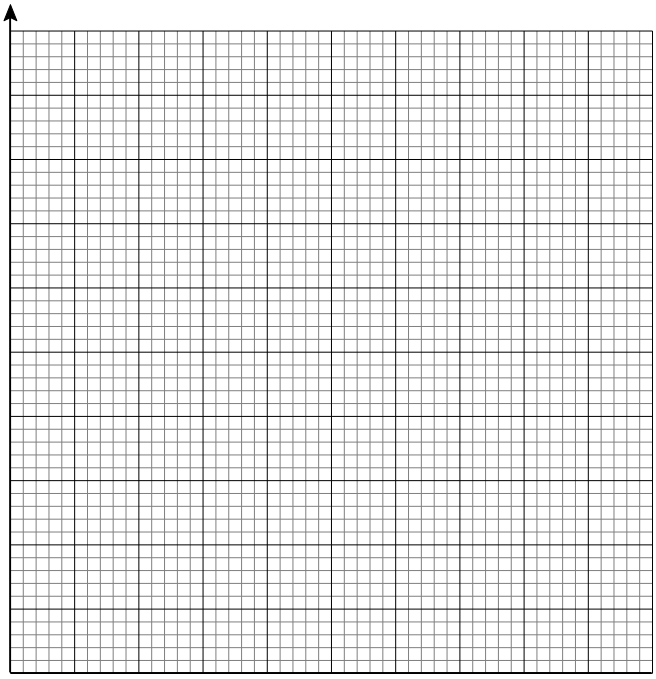


12 (a) Complete the tally table.

	Tally	Frequency
Triangles		
Quadrilaterals		
Pentagons		

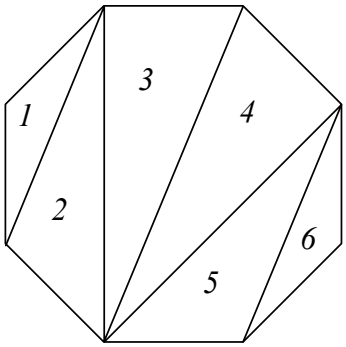
(3 marks)

12 (b) On the grid draw a suitable diagram to show this information.



(3 marks)

13 A regular octagon is split into triangles *1*, *2*, *3*, *4*, *5* and *6*.



13 (a) Complete this list of pairs of congruent triangles.

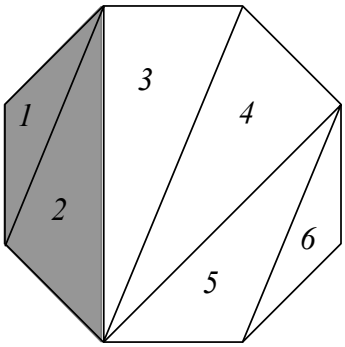
3 and *4*

2 and .....

1 and .....

(2 marks)

13 (b) Triangles *1* and *2* make a trapezium as shown.

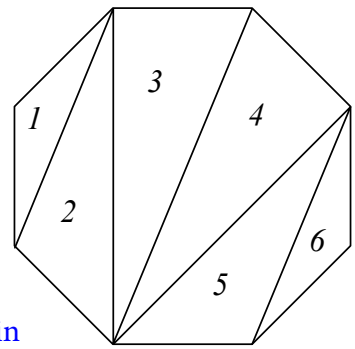


Which of the following triangles also make a trapezium?
Circle your answers.

2 and *3* *3* and *4* *4* and *5* *5* and *6*

(2 marks)

13 (c) Shade **two** triangles in this diagram to make a kite.



(1 mark)

14 John's garden is a rectangle measuring 9 metres by 6 metres.
He decides to make one-third of the area into a vegetable plot and the rest into a lawn.

14 (a) On the grid draw accurately a possible design for John's garden.
Use the scale 1 centimetre represents 1 metre.
Label your design.

1 cm represents 1 m

(4 marks)

14 (b) Lawn turf (grass) costs £2.50 per square metre.
How much will it cost John to turf his new lawn?

.....

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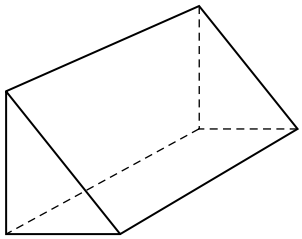
.....

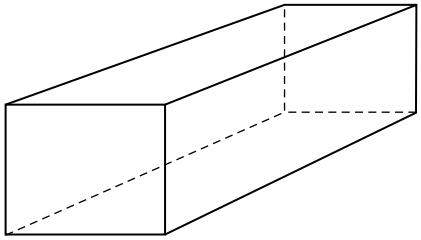
Answer £ ..... *(3 marks)*

15 (a) Draw a 3-D sketch of a square based pyramid.

(1 mark)

15 (b) Give the mathematical name of these solid shapes.

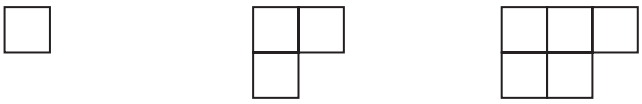




Answer ....

(2 marks)

16 A pattern is formed from squares.



Pattern 1 Pattern 2 Pattern 3 Pattern 4

(1 mark)

16 (a) Draw Pattern 4 in the space above.

16 (b) Find the number of squares in Pattern 6.

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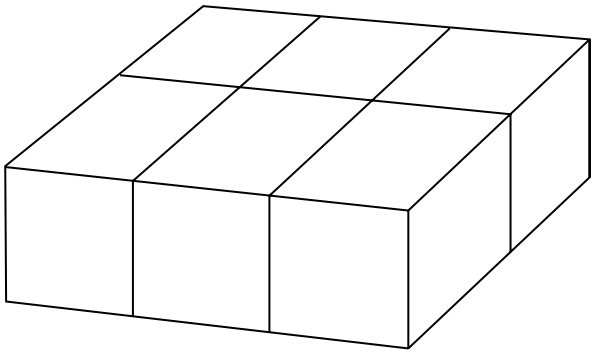
.....

Answer ..... *(1 mark)*

17 (a) How many faces does a cuboid have?

Answer ..... *(1 mark)*

17 (b) This cuboid is made from centimetre cubes.



Find the total surface area of the cuboid.

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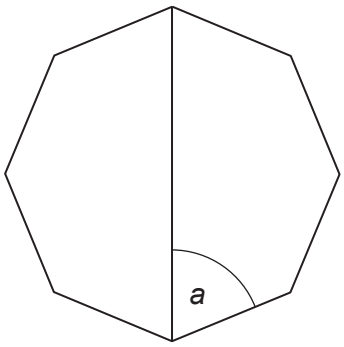
Answer ..... cm^2 *(2 marks)*

18 Below is a regular octagon.



Not drawn accurately

Work out the value of *a*.

.....

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.....

Answer ..... degrees *(3 marks)*

19 **Here are** the standard quadrilaterals

Square	**Rectangle**	**Parallelogram**
Kite	**Rhombus**	**Trapezium**

19 (a) Three different quadrilaterals have these two properties.

Both pairs of opposite sides are equal.
Rotational symmetry order 2

Name the **three** quadrilaterals.

Answer .....

.....

..... *(2 marks)*

19 (b) Two of the quadrilaterals in part (a) also have this property

Diagonals do not cross at right

angles. Name the **two** quadrilaterals.

Answer .....

..... *(1 mark)*

19 (c) For one of the quadrilaterals in part (b), write down an extra property that will distinguish it from the other.

Quadrilateral chosen .....

Property .....

.....

(1 mark)

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

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Examiner's Initials	
Pages	Mark
2 – 3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
TOTAL	

In the style of AQA

General Certificate of Secondary Education
Higher Tier

Mathematics 43602H

Past Paper Type Questions by Topic

Surds and Indices

H

For this paper you must have:
- a calculator
- mathematical instruments.

Time allowed
- 1 hour

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is.
- The quality of your written communication is specifically assessed in some questions. These questions are indicated with an asterisk (*)
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

1 (a) Write as single powers of a

1 (a) (i) $a^6 \times a^{-2}$

Answer ..... *(1 mark)*

1 (a) (ii) $a^8 \div a^{-4}$

Answer ..... *(1 mark)*

1 (b) Simplify the expression $(3a^2b)^3$

.....

.....

.....

Answer ..... *(2 marks)*

2 Expand and simplify fully $(\sqrt{10} + \sqrt{2})(\sqrt{15} - \sqrt{3})$

Give your answer in the form $a\sqrt{b}$, where a and b are integers.

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Answer ..... *(4 marks)*

3 (a) Simplify $a^3b^2 \times 4ab^5$

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Answer ..... *(2 marks)*

3 (b) Factorise fully $a^2 - 8\,ab$

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Answer ..... *(2 marks)*

3 (c) Make x the subject of $w = y + \frac{x}{r}$

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Answer ..... *(2 marks)*

3 (d) Work out the least common multiple (LCM) of $6xy^2$ and $3x^2y$

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Answer ..... *(2 marks)*

4 (a) Work out the value of $9^{-\frac{3}{2}}$

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Answer ..... *(3 marks)*

4 (b) Work out **all** solutions of the equation

$$8^n = 2^{n^2}$$

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Answer ..... *(3 marks)*

5 (a) Write the number 5.28×10^{-3} as an ordinary decimal number.

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Answer ..... *(1 mark)*

5 (b) Work out $(7 \times 10^3)^2$
Give your answer in standard form.

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Answer ..... *(2 marks)*

6 These statistics are about the United States.

- There are 2.5×10^8 passenger vehicles in the United States.
- On average 2×10^7 barrels of fuel are used by these vehicles each day.
- One barrel contains 42 gallons.
- On average each passenger vehicle travels 18 miles on one gallon of fuel.

6 (a) Work out how many gallons of fuel are used each day?

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Answer .....gallons *(2 marks)*

6 (b) What is the average distance each passenger vehicle travels each day.

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Answer .....miles *(2 marks)*

7 (a) Simplify $x^4 \times x^7$

.....

Answer ..... *(1 mark)*

7 (b) Simplify $y^{12} \div y^4$

.....

Answer ..... *(1 mark)*

7 (c) Rearrange $y = 3a + 2$ to make a the subject.

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Answer ..... *(2 marks)*

8 Here is a formula $r = \sqrt{(x^2 - y^2)}$

Work out the value of r when $x = 9\sqrt{2}$ and $y = 5\sqrt{6}$

Give your answer in the form $a\sqrt{b}$ where a and b are integers greater than 1.

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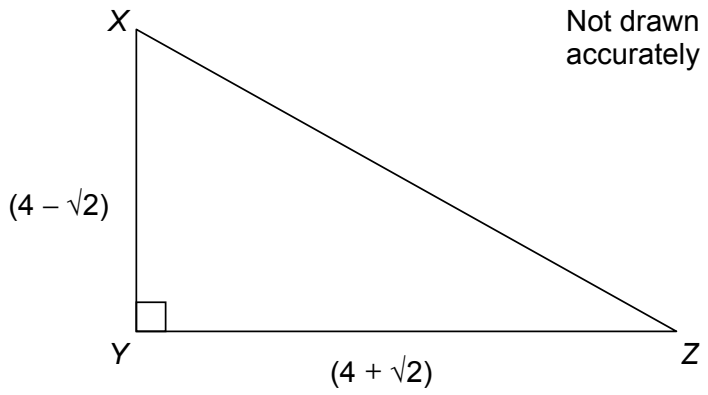
Answer ..... *(3 marks)*

9 *XYZ* is a right-angled triangle.

$XY = (4 - \sqrt{2})$ cm, $YZ = (4 + \sqrt{2})$ cm



Show that the perimeter of the triangle is 14 cm.

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(5 marks)

10 Lauren is using the quadratic formula to solve a quadratic equation. After correctly substituting the values, she writes

$$x = \frac{7 \pm \sqrt{49 - 72}}{4}$$

10 (a) What is the quadratic equation Lauren is trying to solve?

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Answer ..... *(3 marks)*

10 (b) Explain why Lauren will **not** be able to find any solutions to the equation.

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(1 mark)

11 (a) Simplify $n^3 \times n^5$

Answer ..... *(1 mark)*

11 (b) Simplify $\frac{n^4}{n^6}$

Answer ..... *(1 mark)*

11 (c) Simplify fully $\sqrt{\frac{\pi b^3}{4\pi b}}$

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Answer ..... *(2 marks)*

12 (a) Write $\sqrt{28} + \sqrt{63}$ in the form $p\sqrt{7}$, where p is an integer.

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Answer ..... *(2 marks)*

12 (b) Simplify $\frac{30}{\sqrt{5}}$ by rationalising the denominator.

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Answer ..... *(2 marks)*

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
TOTAL	

In the style of

General Certificate of Secondary Education
Foundation Tier

Mathematics 43601F

Past Paper Questions by Topic

Transformations

F

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.

Time allowed
- 1 hour 15 minutes

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.

Information
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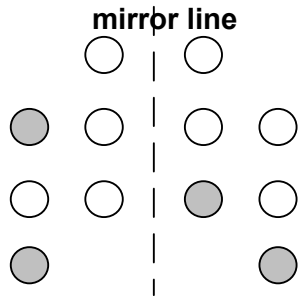
- The maximum mark for this paper is .
- The quality of your written communication is specifically assessed in questions indicated with an asterisk (*)
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

Advice
- In all calculations, show clearly how you work out your answer.

By Peter Bland

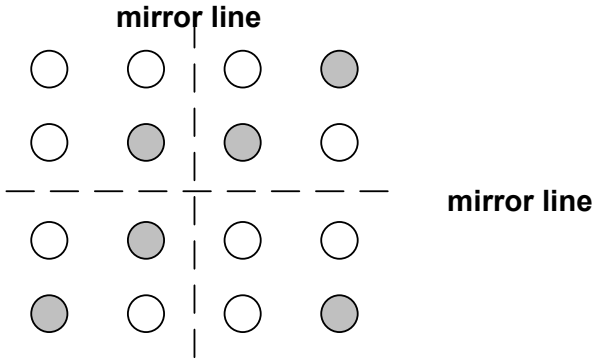
1 Here are some patterns of circles.

1 (a) Shade **four** more circles to give this pattern symmetry in the mirror line.



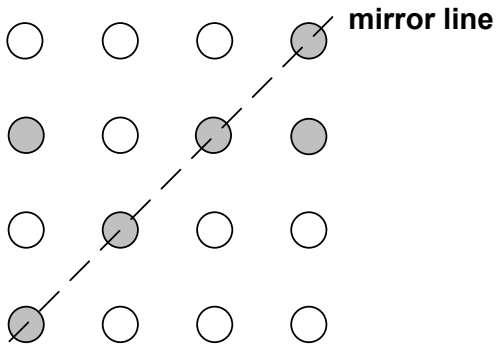
(*2 marks*)

1 (b) Shade **two** more circles to give this pattern symmetry in both mirror lines.



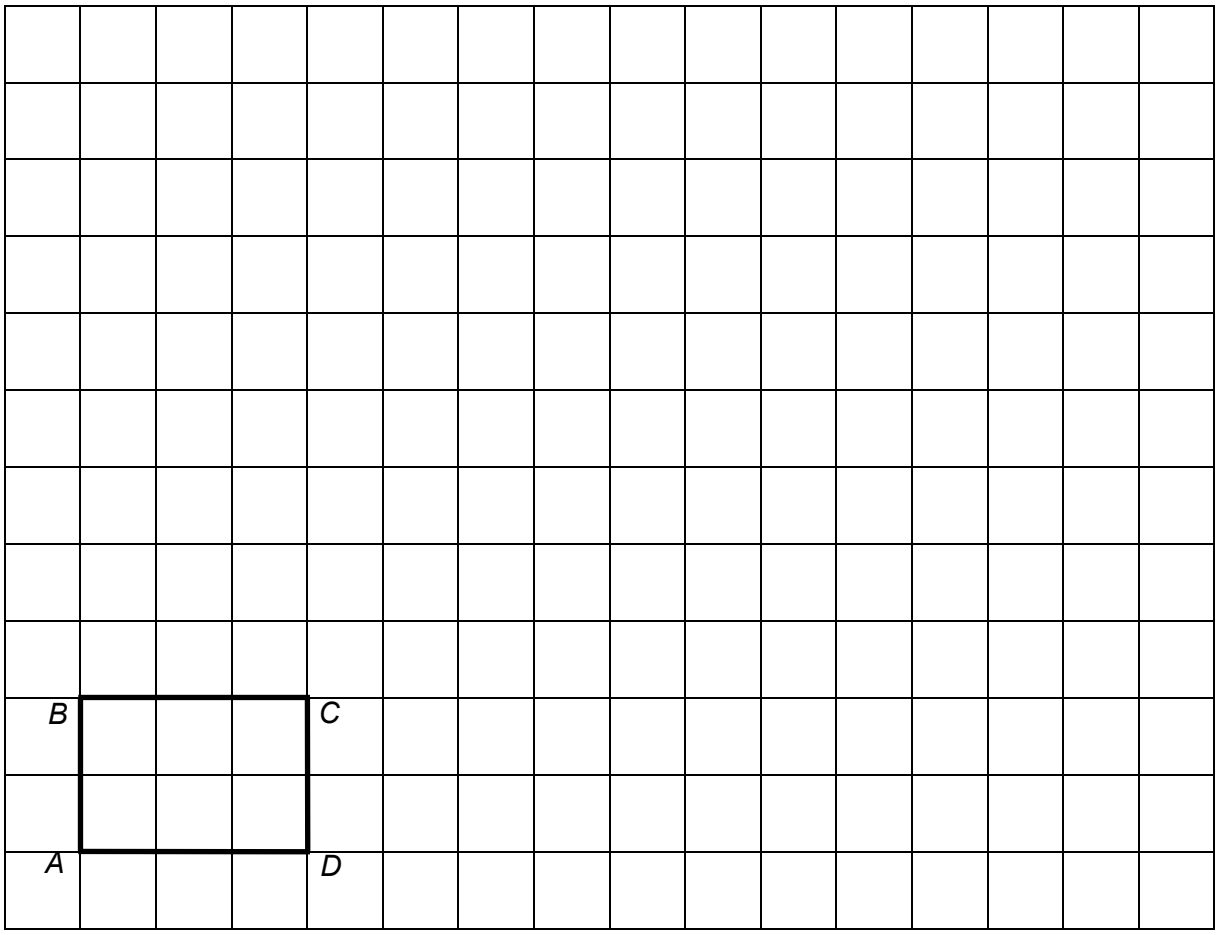
(*2 marks*)

1 (c) Shade **two** more circles to give this pattern symmetry in the mirror line.



(*2 marks*)

2 The shape *ABCD* is drawn on a grid.



2 (a) Enlarge *ABCD* by scale factor 3.

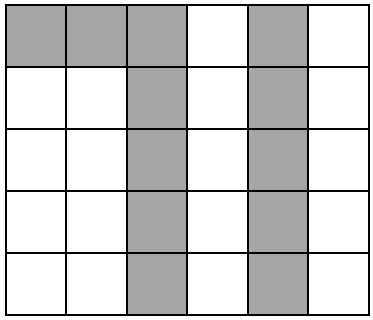
(*2 marks*)

2 (b) How many times bigger is the area of the enlarged shape than the area of *ABCD*?

.....

Answer ..... (*2 marks*)

3 The number 71 is shaded on the grid.



3 (a) What fraction of the grid is shaded?

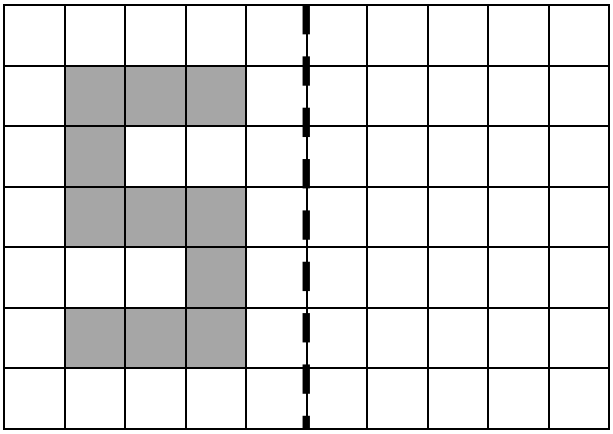
Give your answer in its simplest form.

.....

.....

Answer ..... (*3 marks*)

3 (b) The letter S is shaded on this grid.

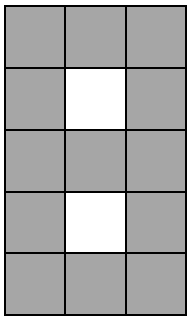


mirror line

Draw the reflection of the letter S in the mirror line.

(*2 marks*)

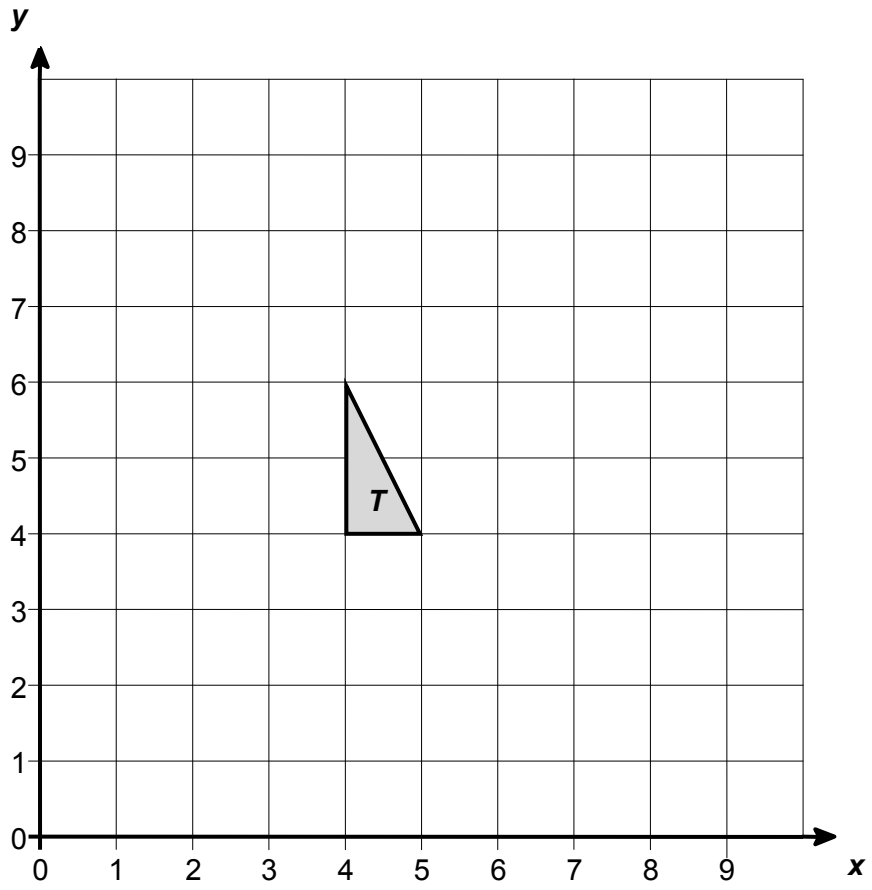
3 (c) The number eight is drawn.



Write down the order of rotational symmetry.

Answer ..... (*1 mark*)

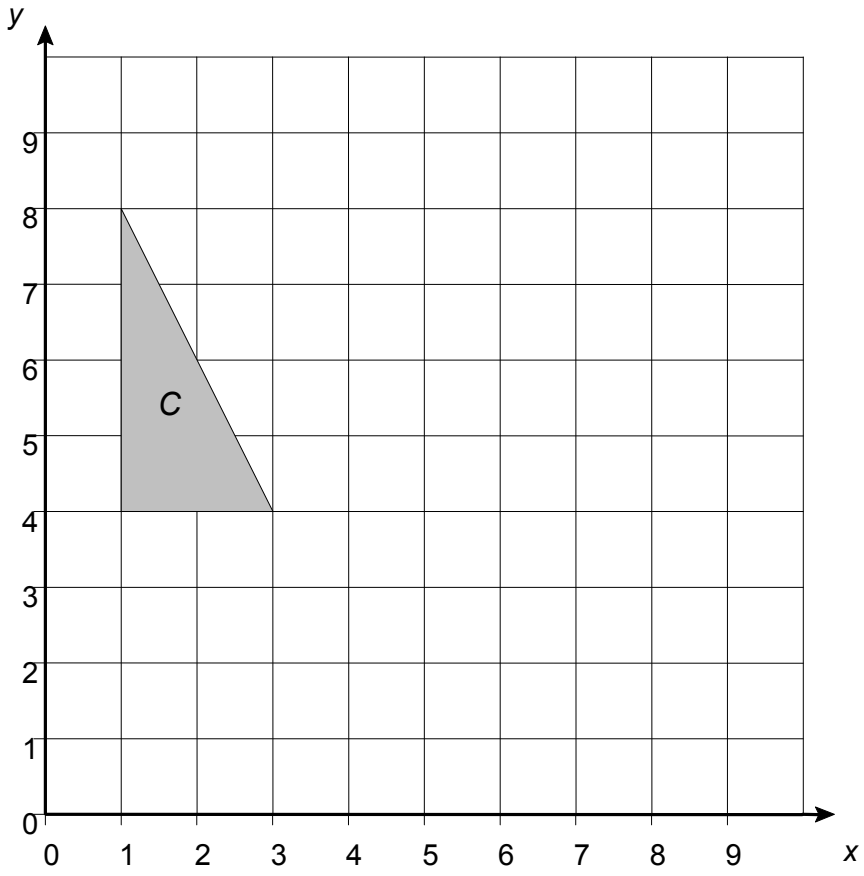
4 Triangle *T* is shown on the grid.



Translate triangle *T* by vector $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$

(*2 marks*)

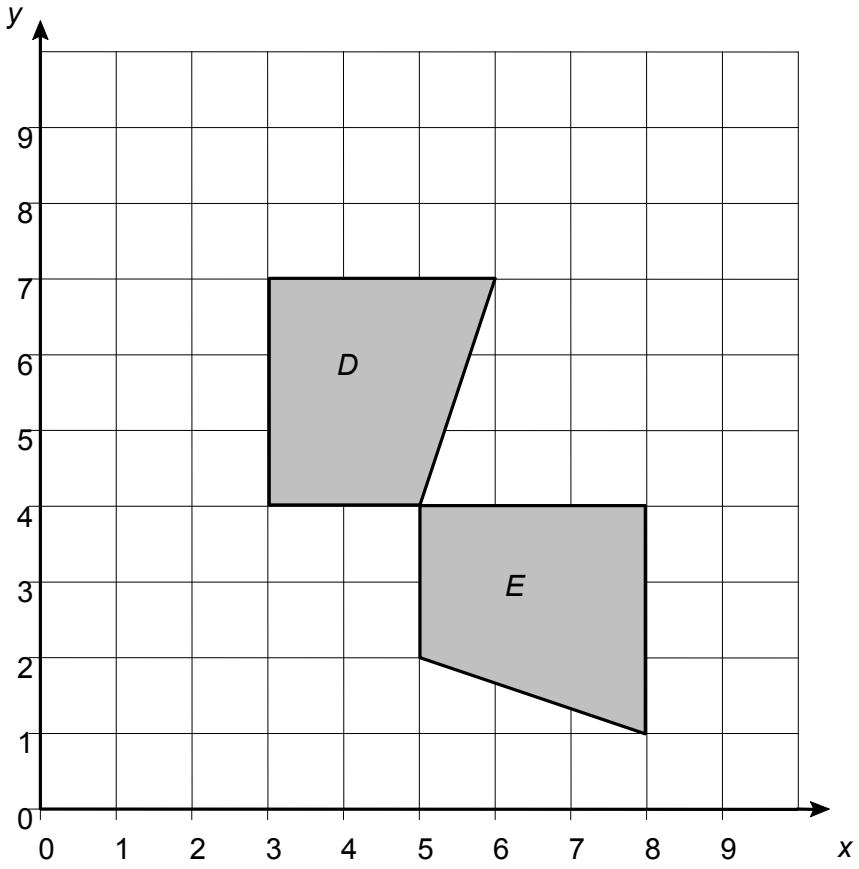
5 (a) The diagram shows shape *C*.



Reflect shape *C* in the line $y = 4$

(*2 marks*)

5 (b) The diagram shows two shapes *D* and *E*.



Describe fully the **single** transformation which takes shape *D* to shape *E*.

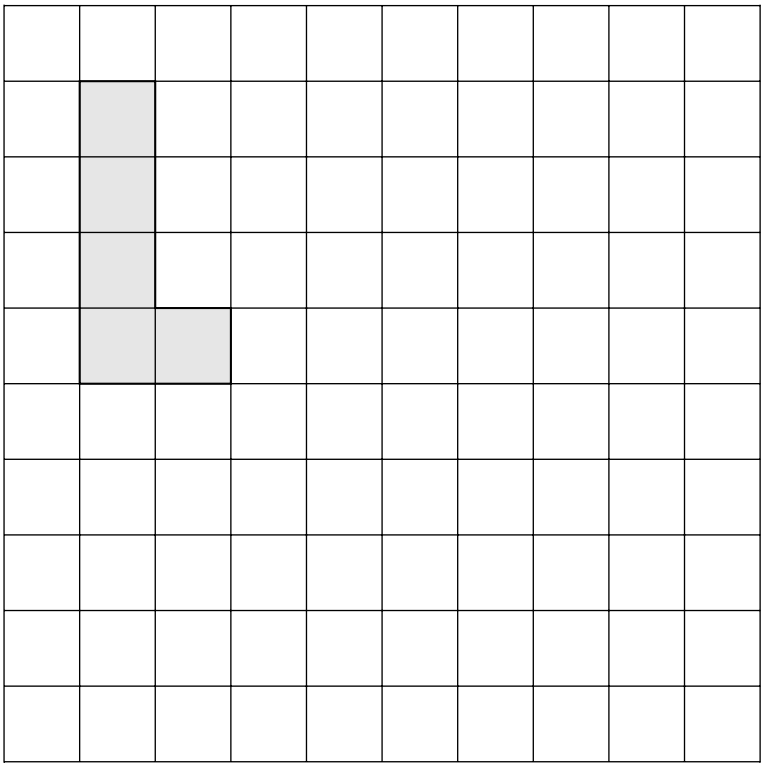
.....

.....

.....

(*3 marks*)

6 (a) Shape *L* has an area of $5\,\text{cm}^2$.



Work out the area of the shape after an enlargement of scale factor 2

.....

.....

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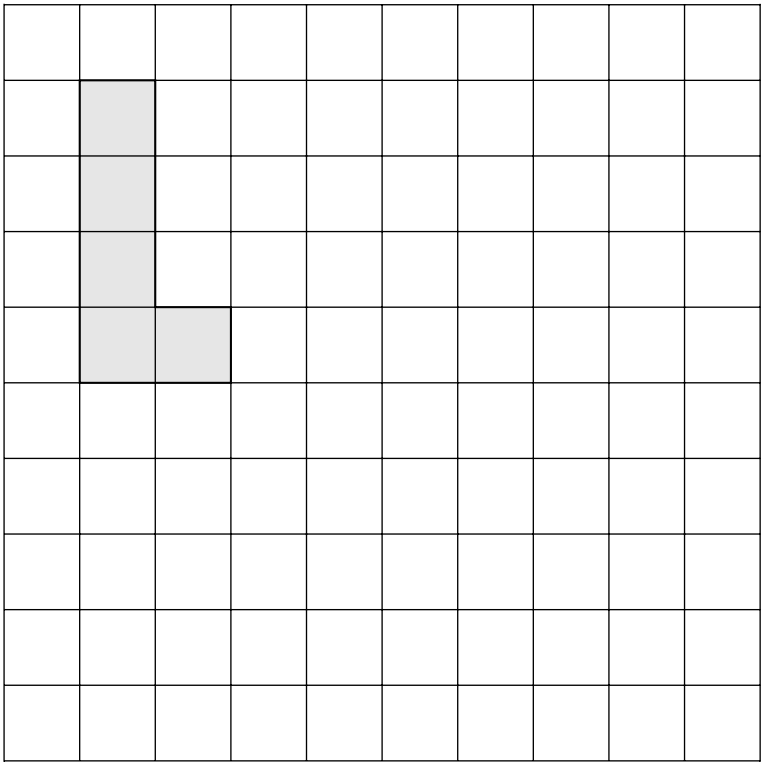
.....

.....

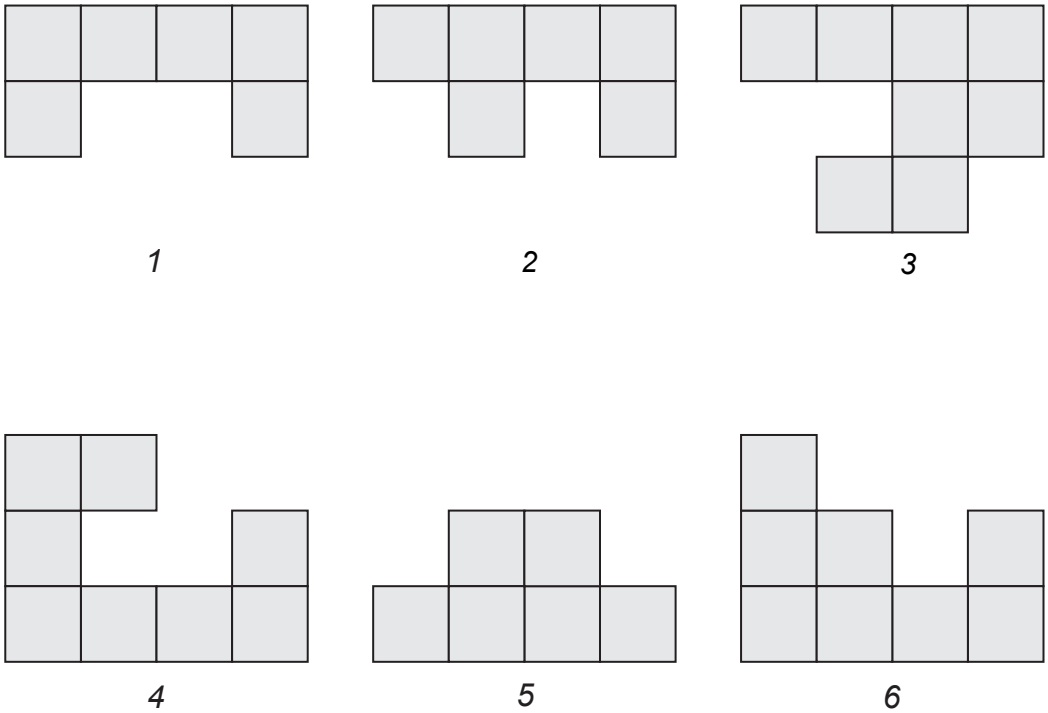
Answer ..... cm^2 *(2 marks)*

6 (b) Rotate the shape clockwise by a quarter of a turn.
Mark with a cross your centre of rotation.



(3 marks)

7 Here are six shapes made from centimetre squares.



7 (a) Which **two** shapes fit together to make a rectangle?

Answer ..... and ..... *(1 mark)*

7 (b) Which **two** shapes fit together to make a square?

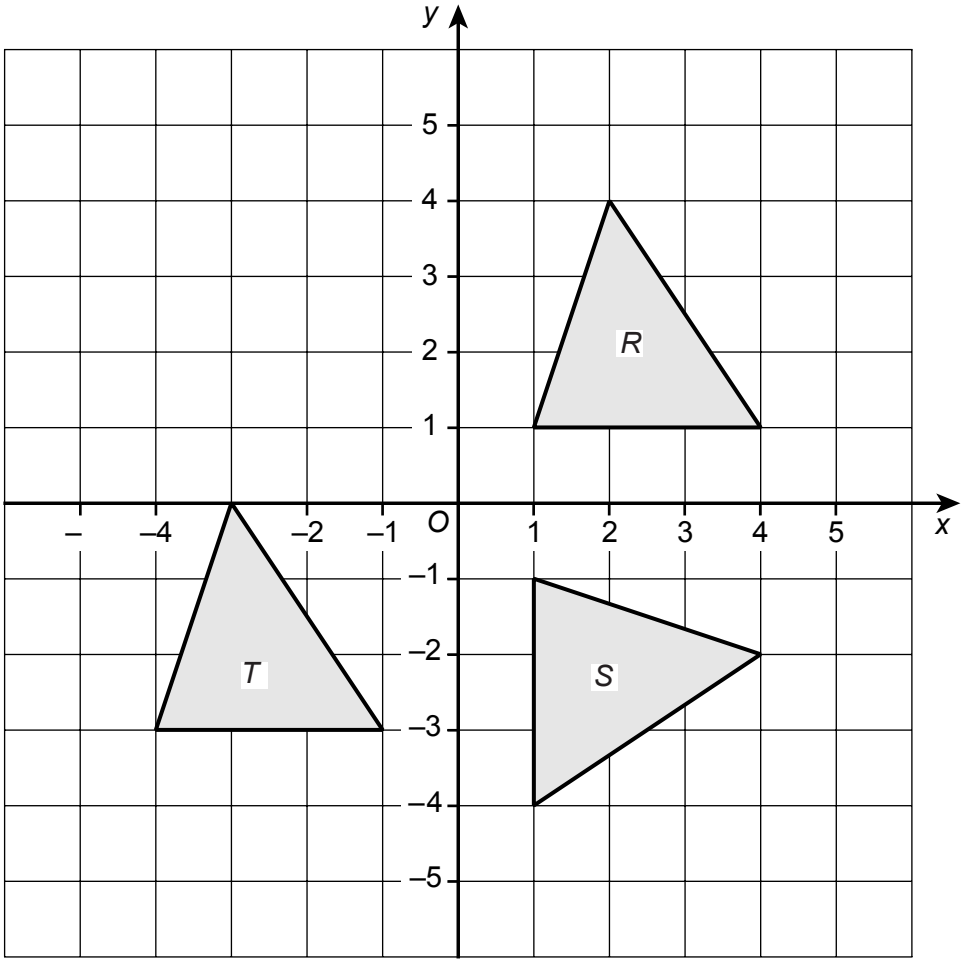
Answer ..... and ..... *(1 mark)*

7 (c) Work out the area of shape *D*. State the units of your answer.

.....

Answer ..... *(2 marks)*

8 Triangles *R*, *S* and *T* are shown on the grid.



8 (a) Describe fully the **single** transformation that maps triangle *R* onto triangle *S*.

.....

.....

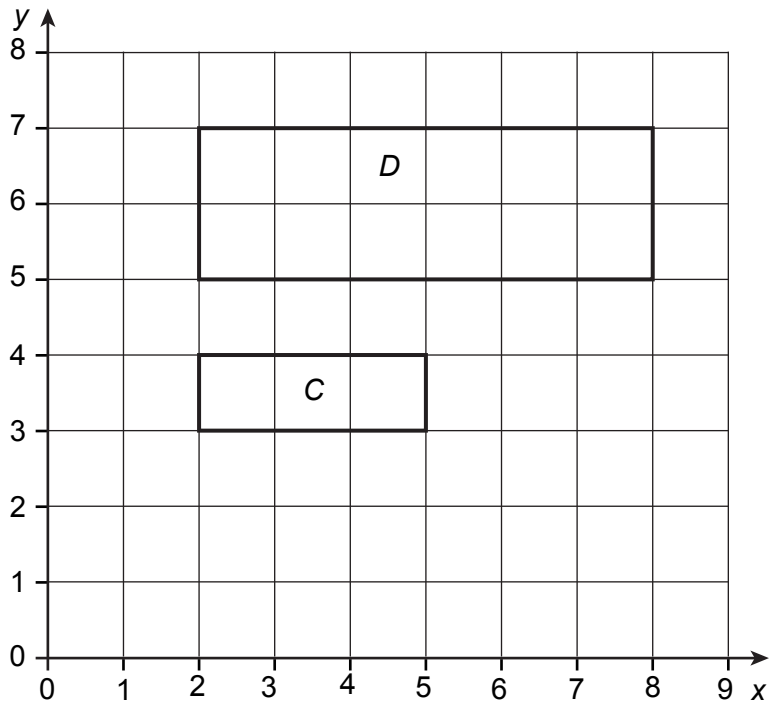
.....

(3 marks)

8 (b) Write down the vector which describes the translation of triangle *R* onto triangle *T*.

Answer ..... *(1 mark)*

9 Rectangle *D* is an enlargement of rectangle *C*.



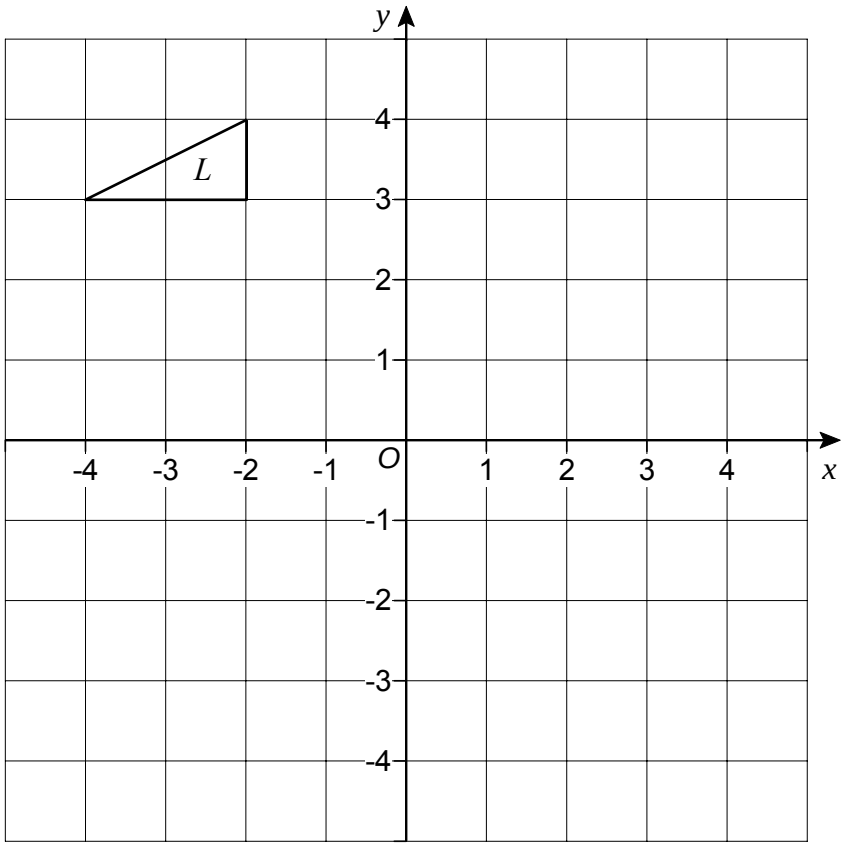
9 (a) Write down the scale factor of the enlargement.

Answer ..... *(1 mark)*

9 (b) Write down the coordinates of the centre of the enlargement.

Answer (..... , ...) *(1 mark)*

10 The diagram shows a triangle *L*, with vertices at (–4, 3), (–2, 3) and (–2, 4).



10 (a) Draw a image of triangle *L* when it is reflected in the line $y = 1$

Label your image *M*.

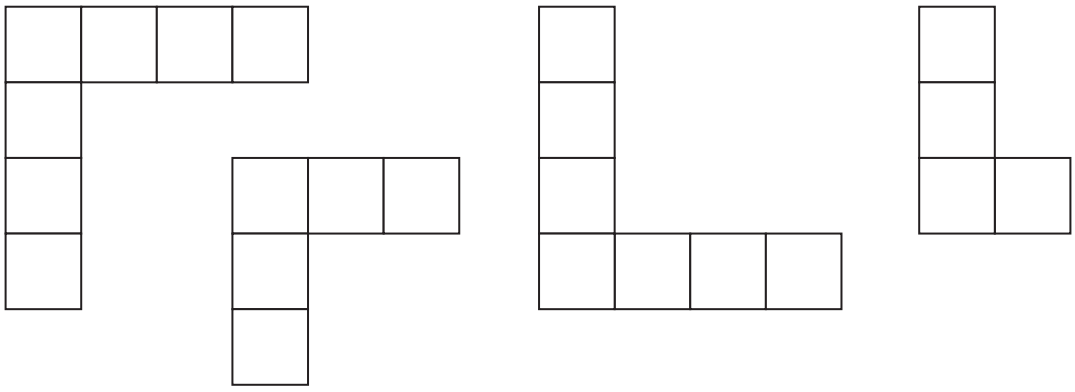
(2 marks)

10 (b) Draw an image of triangle *L* when it is rotated 90° clockwise about the origin.

Label your image *N*.

(3 marks)

11 Shapes *W*, *X*, *Y* and *Z* are made from squares of sides 1 cm.



W *X* *Y* *Z*

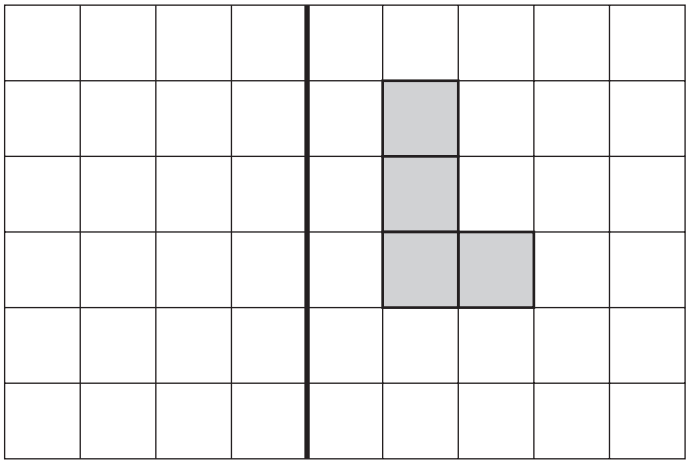
11 (a) Which **two** shapes are congruent?

Answer Shape ..... and Shape .....

(1 mark)

11 (b) Shape *L* is drawn on the grid.

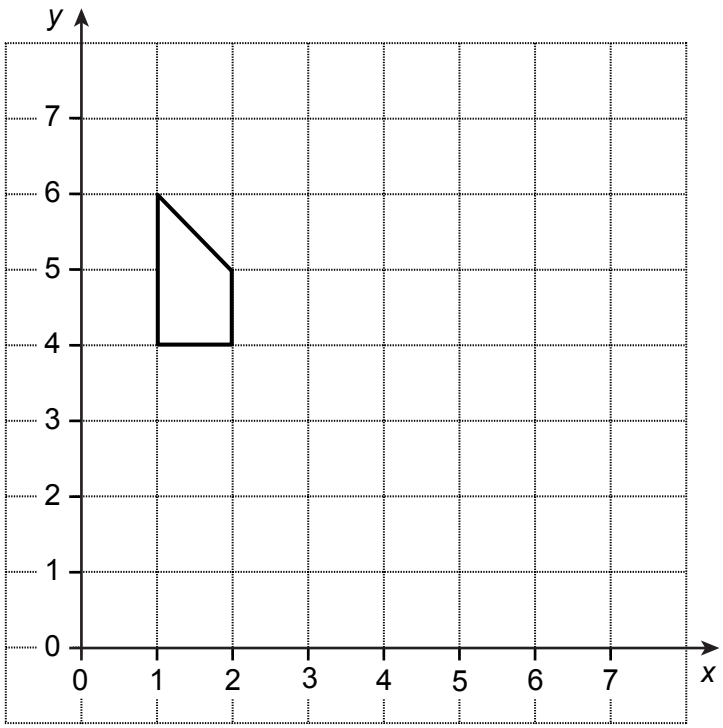
Reflect shape *L* in the mirror line.



Mirror line

(2 marks)

12 Enlarge the shape in the diagram by a scale factor 3, centre (0, 6).



(2 marks)