

- 1 (a) A group of 50 children were each asked which type of book they most like to read. The pictogram shows some of the results.

Type of book	Number of children
Adventure	○○○
Horror	
History	○
Comedy	○○○
Fantasy	○○○○

Key: ○ = 4 children

- (i) How many children said Comedy?

..... [1]

- (ii) 9 children said they liked Horror best.

Complete the pictogram.

[1]

- (iii) Which type of book was most popular?

..... [1]

- (iv) One of the children is chosen at random.

Find the probability that they liked History best.

..... [1]

- (b) The same 50 children were each asked how many books they had read in the past month. The results are shown in the table.

Number of books	1	2	3	4	5	6
Frequency	7	14	12	5	8	4

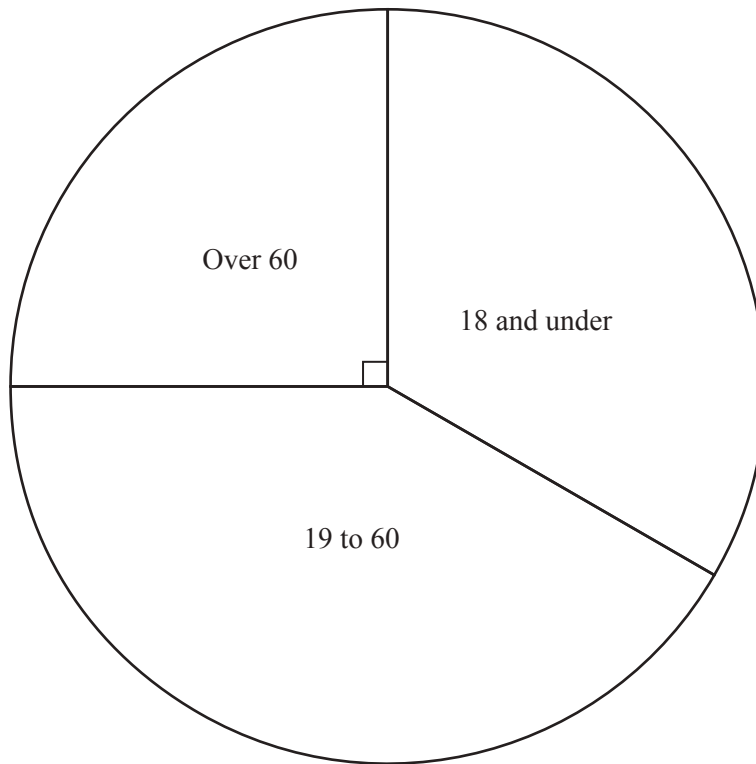
- (i) Find the median.

..... [2]

- (ii) Calculate the mean.

..... [3]

- (c) The ages of 300 people visiting a library one day were recorded. The pie chart shows the results.



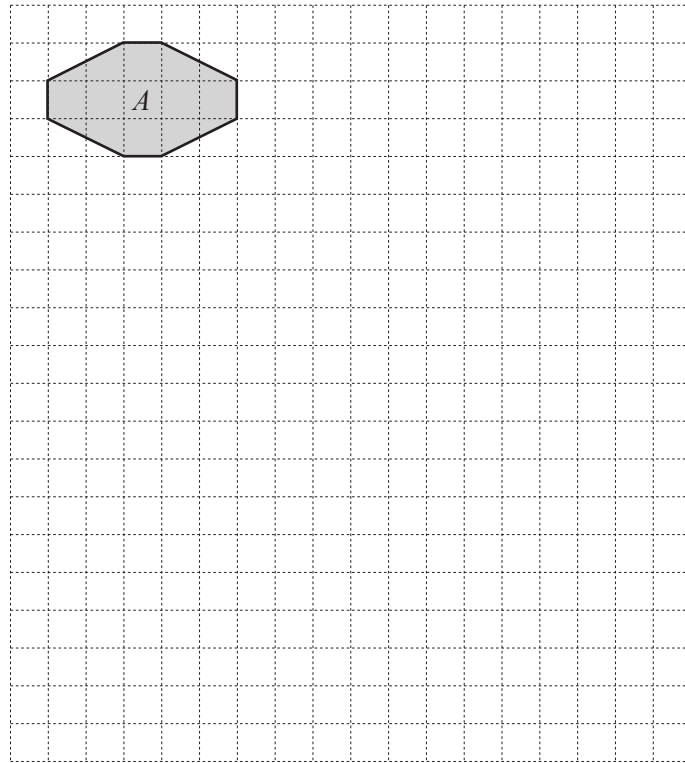
- (i) What fraction of the people were aged over 60?

..... [1]

- (ii) How many people were aged 19 to 60?

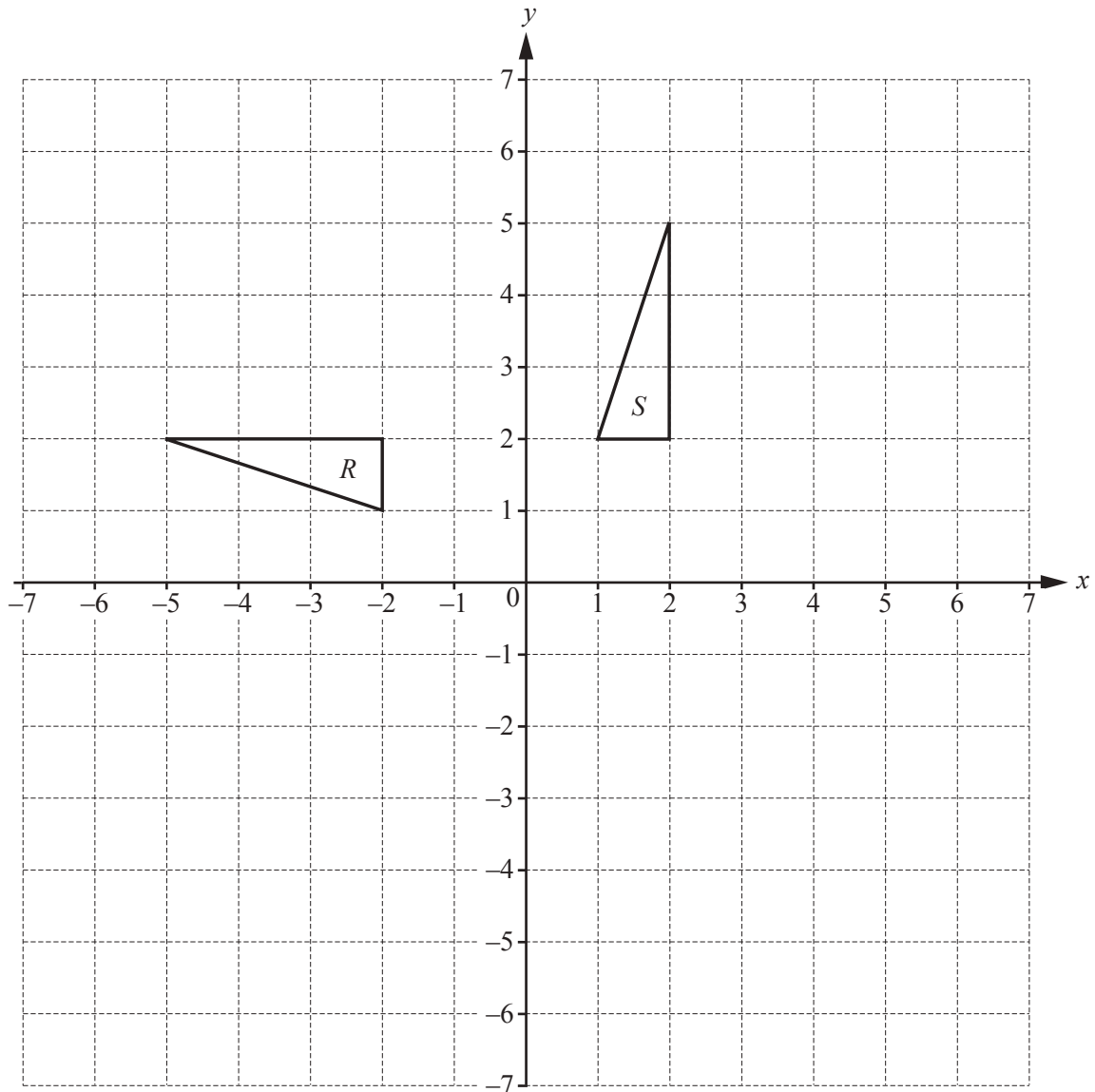
..... [3]

- 2 (a) Polygon A is shown on the grid.



- (i) Write down the mathematical name of polygon A .
 [1]
- (ii) Write down the order of rotational symmetry of polygon A .
 [1]
- (iii) Polygon A is enlarged by scale factor 3 to give polygon B .
 Draw polygon B on the grid. [2]

(b) Triangle R and triangle S are shown on the grid.



(i) Describe fully the **single** transformation that maps triangle R onto triangle S .

.....
 [3]

(ii) Reflect **triangle R** in the x -axis. [1]

(iii) Translate **triangle S** by the vector $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$. [2]

- 3 (a) Tariq wants to buy some orange juice.
He sees these offers in a shop.

Offer A 1-litre carton \$0.65	Offer B 2-litre carton \$1.25	Offer C Pack of 4 1-litre cartons \$2.56
--	--	--

Work out the lowest amount Tariq could pay for 5 litres of orange juice.
Show how you decide.

Tariq buys cartons.

The lowest amount is \$..... [3]

- (b) Bottle P contains 1.5 litres of lemonade.
Bottle Q contains $\frac{1}{3}$ more lemonade than bottle P .

Work out how much lemonade is in bottle Q .

..... litres [2]

- (c) Tariq makes a fruit drink.
He mixes 500 ml of orange juice, 200 ml of pineapple juice and 1 litre of lemonade.

(i) Write the ratio orange juice : pineapple juice : lemonade in its simplest form.

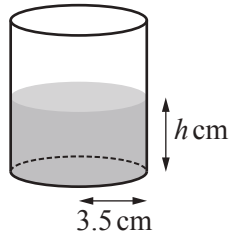
..... : : [2]

(ii) Tariq makes more of this fruit drink.

Work out the total amount of fruit drink he makes when he uses 2 litres of orange juice.
Give your answer in litres.

..... litres [3]

- (d) Tariq pours 300 cm^3 of fruit drink into a glass.
The glass is in the shape of a cylinder with radius 3.5 cm .
The height of the drink in the glass is $h\text{ cm}$.



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Work out the value of h .

$$h = \dots\dots\dots [2]$$

- (e) The capacity of a jug is 750 ml correct to the nearest 10 ml .

Write down the upper and lower bounds of the capacity of the jug.

Upper bound = $\dots\dots\dots\text{ ml}$

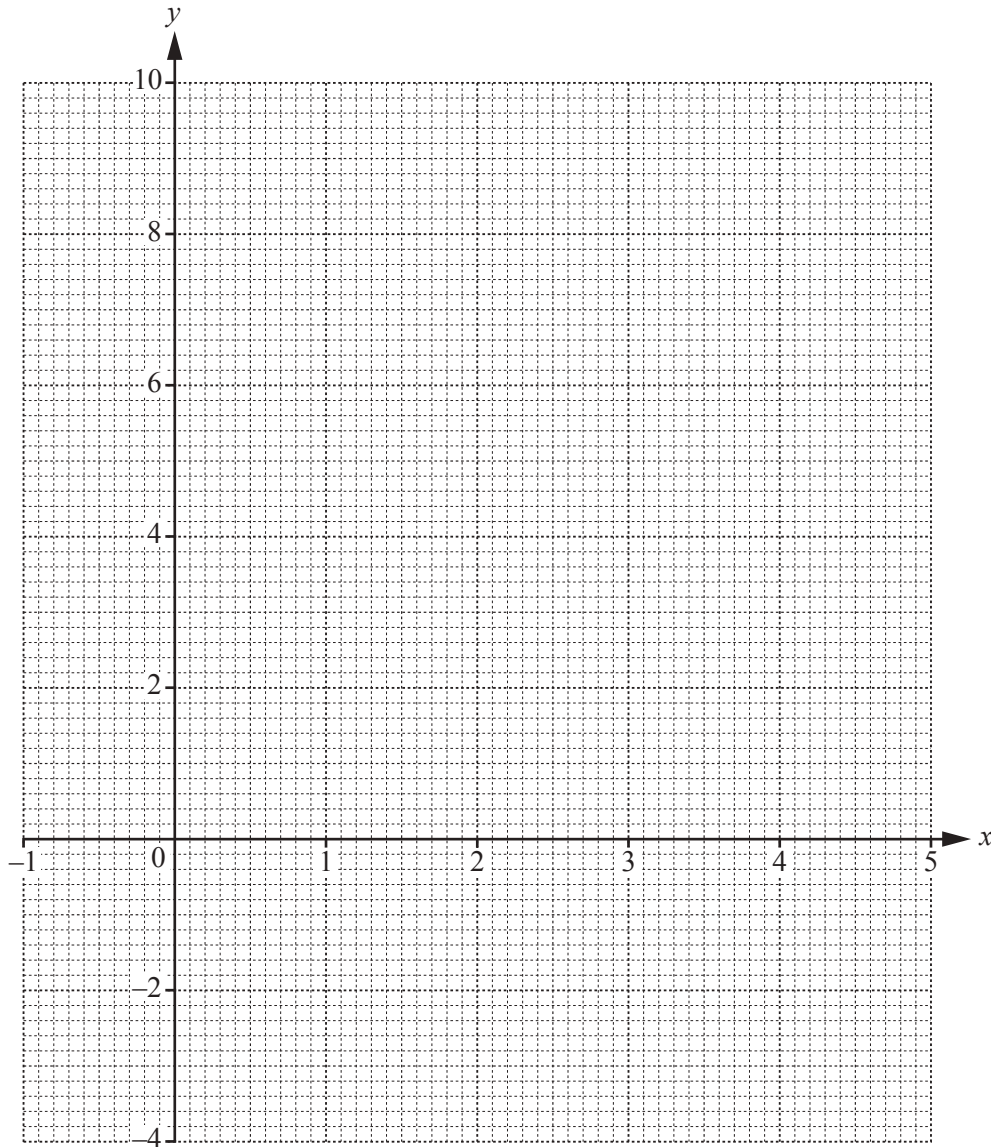
Lower bound = $\dots\dots\dots\text{ ml}$ [2]

- 4 (a) Complete the table of values for $y = x^2 - 5x + 3$.

x	-1	0	1	2	3	4	5
y		3	-1			-1	3

[2]

- (b) On the grid, draw the graph of $y = x^2 - 5x + 3$ for $-1 \leq x \leq 5$.



[4]

(c) Write down the equation of the line of symmetry of the graph of $y = x^2 - 5x + 3$.

..... [1]

(d) Write down the co-ordinates of the point where the line $y = 4 - x$

(i) crosses the x -axis,

(..... ,) [1]

(ii) crosses the y -axis.

(..... ,) [1]

(e) On the grid, draw the line $y = 4 - x$.

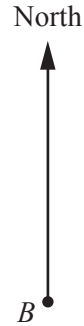
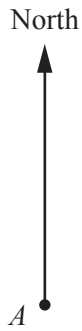
[1]

(f) Write down the co-ordinates of the points of intersection of the graph of $y = x^2 - 5x + 3$ and the line $y = 4 - x$.

(..... ,)

(..... ,) [2]

- 5 (a) The scale drawing shows the positions of three villages, *A*, *B* and *C*.
The scale is 1 centimetre represents 5 kilometres.



C

Scale: 1 cm to 5 km

- (i) Find the actual distance between village *A* and village *B*.

..... km [2]

- (ii) Measure the bearing of *B* from *A*.

..... [1]

- (iii) Another village, *D*, is 30 km from village *B* on a bearing of 215° .

On the scale drawing, mark the position of village *D*. [2]

- (iv) A power station, *P*, is 25 km from village *C*.
It is equidistant from village *A* and village *B*.

Using a ruler and compasses only, construct and mark a position of the power station, *P*. [3]

- (b) A bus takes workers from village *C* to the power station.
Each journey takes 35 minutes.

- (i) Complete the timetable for the bus.

Village <i>C</i>	05 45		
Power station		06 50	08 05

[3]

- (ii) The bus travels 25 km from village *C* to the power station.

Calculate the average speed of the bus in kilometres per hour.

..... km/h [2]

- 6 (a) Write down a factor of 24 that is a square number.

..... [2]

- (b) Write down the cube number between 100 and 200.

..... [1]

- (c) Find

(i) $\sqrt{12.25}$,

..... [1]

(ii) 17^3 ,

..... [1]

(iii) 4^{-2} .

..... [1]

(d) $s = \frac{1}{2}at^2$

Find the value of s when $a = 0.7$ and $t = 4.2$.

$s =$ [2]

- (e) Simplify.

(i) a^0

..... [1]

(ii) $b^3 \times b^2$

..... [1]

(iii) $\frac{c^4}{c^8}$

..... [1]

7 (a) Mei is paid \$15.25 for each hour she works.

(i) Work out how much she is paid when she works for 8 hours.

\$ [1]

(ii) Mei gets a pay increase.
She is paid 8% more for each hour she works.
Mei works for 38 hours each week.

Work out how much Mei earns each week after the pay increase.

\$ [3]

(b) Xia works in France.
She is paid 425 euros each week.
The exchange rate between euros (€) and dollars is €1 = \$1.45 .

Work out who earns more each week, Mei or Xia, and by how much.
Give your answer in dollars.

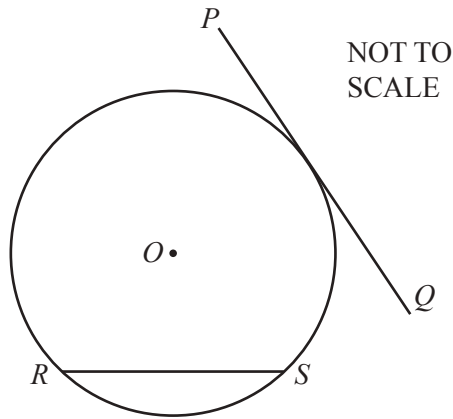
..... earns more by \$ [3]

(c) Mei invests \$500 in a bank at a rate of 3.5% per year compound interest.

Calculate the **total** amount of money she will receive at the end of 3 years.

\$ [3]

8 (a)



The diagram shows a circle, centre O , and lines PQ and RS .

Write down the mathematical name for

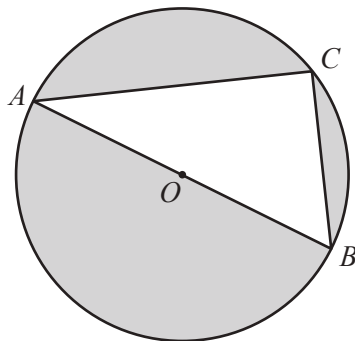
(i) line PQ ,

..... [1]

(ii) line RS .

..... [1]

(b)



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A , B and C are points on the circle, centre O .

(i) Complete the statement.

Angle $ACB = 90^\circ$ because [1]

(ii) $AC = 8$ cm and $BC = 5$ cm.

Calculate the area of triangle ABC .

.....cm² [2]

(iii) Show that the diameter of the circle is 9.43 cm, correct to 2 decimal places.

[2]

(iv) Calculate the area of the circle.

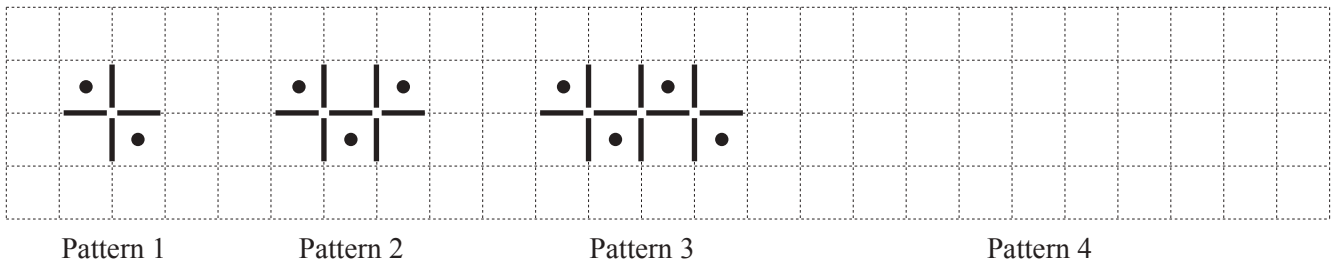
.....cm² [2]

(v) Calculate the percentage of the circle that is shaded.

..... % [2]

Question 9 is printed on the next page.

9 A sequence of patterns is made from lines and dots.
The first three patterns in the sequence are shown.



Pattern 1 Pattern 2 Pattern 3 Pattern 4

(a) Draw Pattern 4 on the grid. [1]

(b) Complete the table.

Pattern	1	2	3	4		10
Number of dots	2	3				
Number of lines	4	7				

[4]

(c) Find an expression, in terms of n , for

(i) the number of dots in Pattern n ,

..... [1]

(ii) the number of lines in Pattern n .

..... [2]

(d) One of these patterns has 76 lines.

Work out how many **dots** are in this pattern.

..... [2]

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