

[Turn over

ELECTRONIC CALCULATORS MUST NOT BE USED IN THIS PAPER**1** Work out.

(a) 0.05×0.3

..... [1]

(b) $600 \div 0.2$

..... [1]

(c) $20 - 12 \div (8 - 6)$

..... [1]

2

This rectangle is split into squares of two different sizes.

Find the fraction of the rectangle that is shaded grey.

..... [1]

- 3 (a) Find the decimal which is exactly halfway between $\frac{3}{5}$ and 68% .

..... [1]

- (b) Write 4.073 82 correct to 3 decimal places.

..... [1]

- (c) Evaluate $\sqrt[3]{64}$.

..... [1]

- 4 Sonu records the temperature, in $^{\circ}\text{C}$, at midnight every day for 12 days.
Here are the results in order, starting with the coldest.

−6 −5 −3 −2 −1 −1 T 5 5 6 6 7

- (a) Find the range of the temperatures.

..... $^{\circ}\text{C}$ [1]

- (b) The median temperature is 1°C .

Find the value of T .

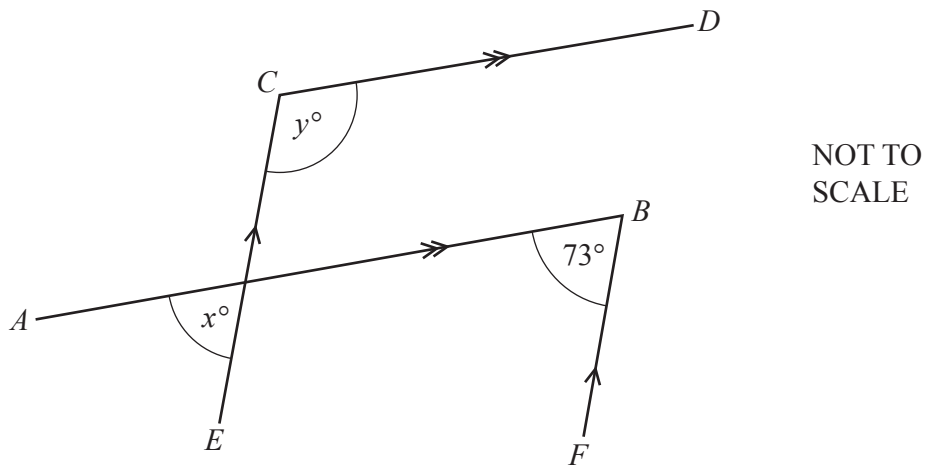
$T =$ [1]

- 5 Anna and Ria share some money in the ratio 5 : 9.
Ria receives \$8 more than Anna.

Work out the total amount of money that is shared.

\$ [2]

6



AB and CD are parallel lines.
 EC and FB are parallel lines.
Angle $ABF = 73^\circ$.

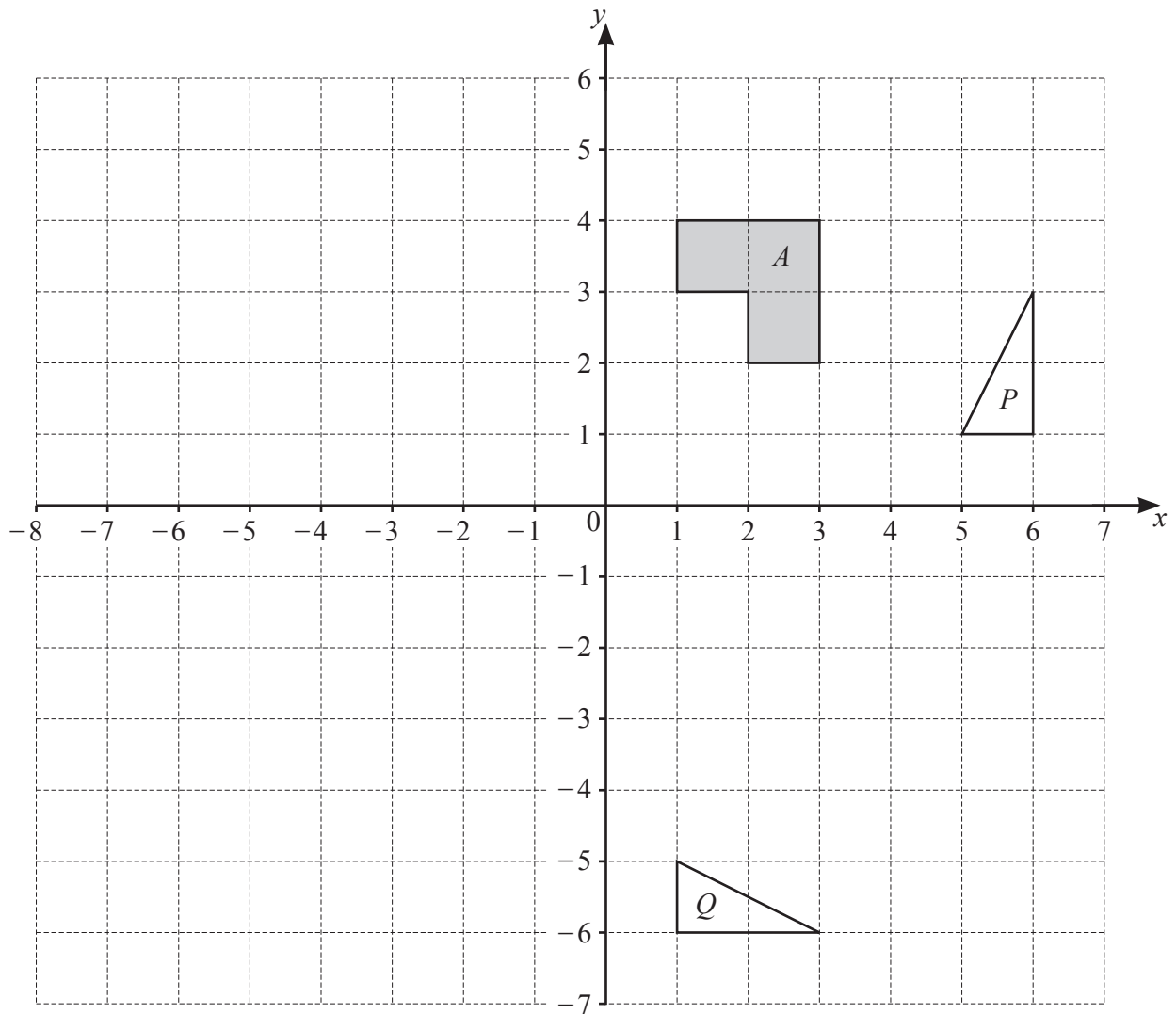
- (a) Find the value of x .

$x =$ [1]

- (b) Find the value of y .

$y =$ [1]

- 7 Shape A and triangles P and Q are drawn on a centimetre square grid.



- (a) Describe fully the **single** transformation that maps triangle P onto triangle Q .

.....
 [3]

- (b) Shape B is an enlargement of shape A .
 The centre of enlargement is $(5, 5)$.
 The area of shape B is 27 cm^2 .

Draw shape B on the grid.

[3]

- 8 (a) Write the number 0.004 93 in standard form.

..... [1]

- (b) Evaluate $(4 \times 10^9) \times (2 \times 10^{-2})$.
Give your answer in standard form.

..... [1]

- 9 (a) Write 180 as the product of its prime factors.

..... [2]

- (b) Expressed as the product of their prime factors,

$$36 = 2^2 \times 3^2 \quad \text{and} \quad N = 2^2 \times 3 \times k, \text{ where } k > 3.$$

180 is the lowest common multiple (LCM) of 36 and N .

Find the value of k .

$k =$ [1]

- 10 By writing each number correct to 1 significant figure, estimate the value of

$$\sqrt{\frac{1240 \times 3.8}{11.2}}.$$

..... [2]

- 11 Solve $7m - 13 \leq 8$.

..... [2]

- 12 Solve the simultaneous equations.
Show all your working.

$$\begin{aligned} 5x + 4y &= 14 \\ 3x - 2y &= 15 \end{aligned}$$

$x =$

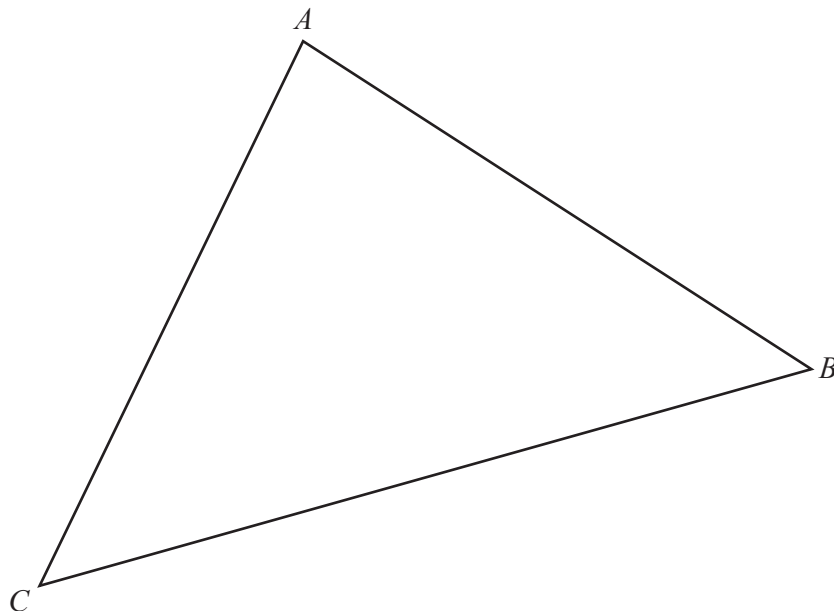
$y =$ [3]

- 13 A list of eight numbers has a mean of 12.
The first five numbers have a mean of 9.

Find the sum of the three remaining numbers.

..... [2]

14



- (a) Measure angle ABC .

Angle $ABC =$ [1]

- (b) **Using compasses and a straight edge only**, construct the perpendicular bisector of AC . [2]

- (c) On the diagram, shade the region inside triangle ABC that is

- nearer to A than to C
- and
- more than 6 cm from B .

[2]

- 15 (a)** The second term of a linear sequence is 28.
The fifth term of the sequence is 16.

Find the first term, the third term and the fourth term of this sequence.

First term =

Third term =

Fourth term = [2]

- (b)** These are the first five terms of a different sequence.

3 9 19 33 51

Find an expression for the n th term of this sequence.

..... [2]

16 $T = \sqrt{P-4}$

- (a)** Work out the value of T when $P = 40$.

$T =$ [1]

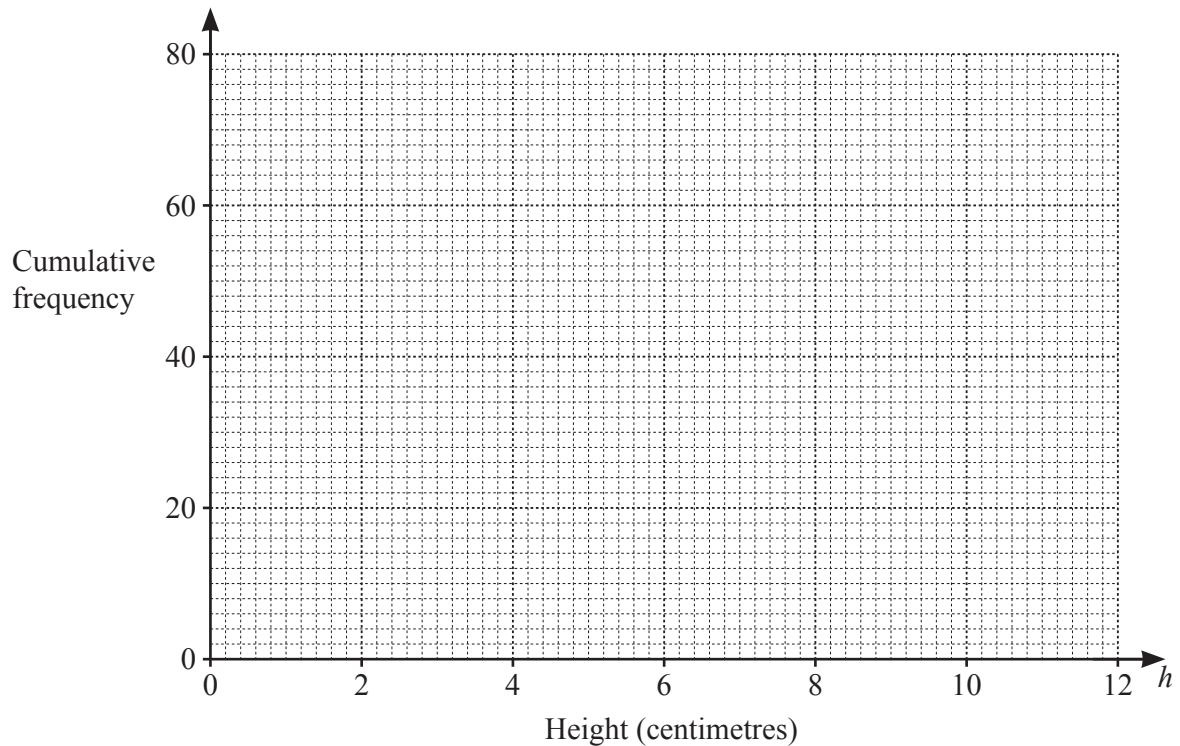
- (b)** Rearrange the formula to make P the subject.

$P =$ [2]

- 17 The heights of 80 plants are measured.
The table shows the results.

Height (h centimetres)	$h \leq 2$	$h \leq 4$	$h \leq 6$	$h \leq 8$	$h \leq 10$	$h \leq 12$
Cumulative frequency	4	18	42	60	72	80

- (a) Draw a cumulative frequency diagram to show this information.



[2]

- (b) Use your diagram to find an estimate for the interquartile range.

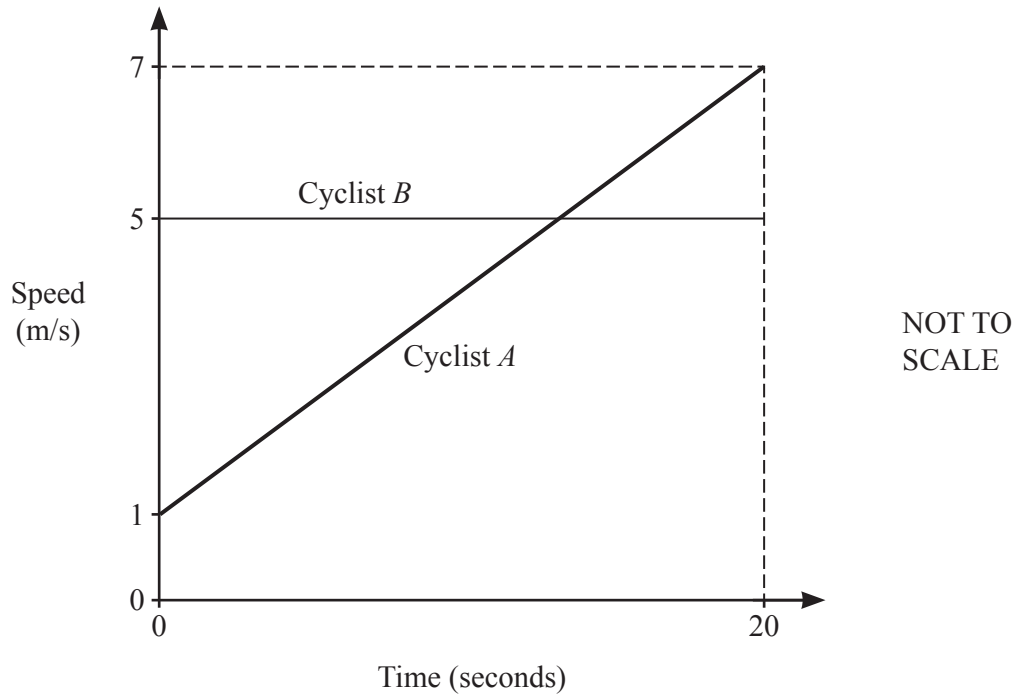
..... cm [2]

- (c) Plants are sold when they are taller than H centimetres.
28 of these plants are sold.

Find the value of H .

$H =$ [2]

- 18 The diagram shows the speed–time graph of part of a journey for two cyclists, *A* and *B*.



- (a) Find the acceleration of cyclist *A* during the first 20 seconds.

..... m/s^2 [1]

- (b) Find which cyclist travelled further in the first 20 seconds and by how many metres.

Cyclist travelled further by metres [3]

- 19 Express as a single fraction in its simplest form.

$$\frac{x+1}{8} + \frac{3x}{4} - \frac{5x}{16}$$

..... [2]

- 20 Factorise.

(a) $2cd + ce - 6d - 3e$

..... [2]

(b) $3v^2 - 27t^2$

..... [2]

21

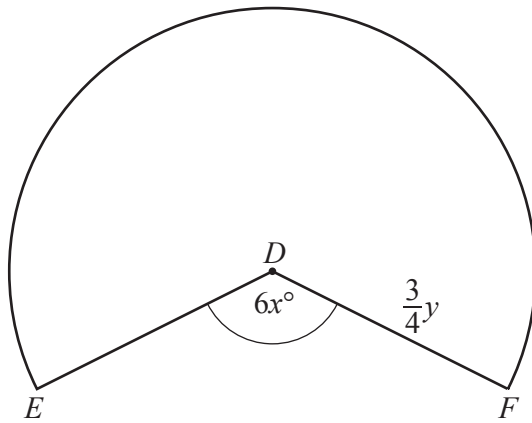


Diagram A

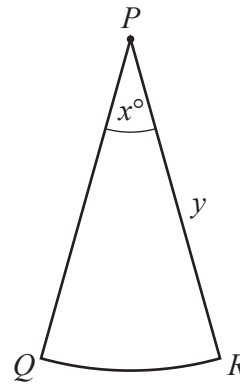


Diagram B

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Diagram A shows a sector of a circle, centre D and radius $\frac{3}{4}y$ cm.
The obtuse angle $EDF = 6x^\circ$.

Diagram B shows a sector of a circle, centre P and radius y cm.
The sector angle is x° .

- (a) The length of the major arc EF is 9 times the length of the arc QR .

Show that $x = 20$.

[3]

- (b) Find the value of y when the area of sector QPR is equal to $2\pi \text{ cm}^2$.

$y = \dots\dots\dots$ [2]

22

$$\begin{pmatrix} x & 3 \\ 2 & x+1 \end{pmatrix} \begin{pmatrix} x-1 \\ 2 \end{pmatrix} = \begin{pmatrix} 2x+6 \\ y \end{pmatrix}$$

(a) Show that $x^2 - 3x = 0$.

[2]

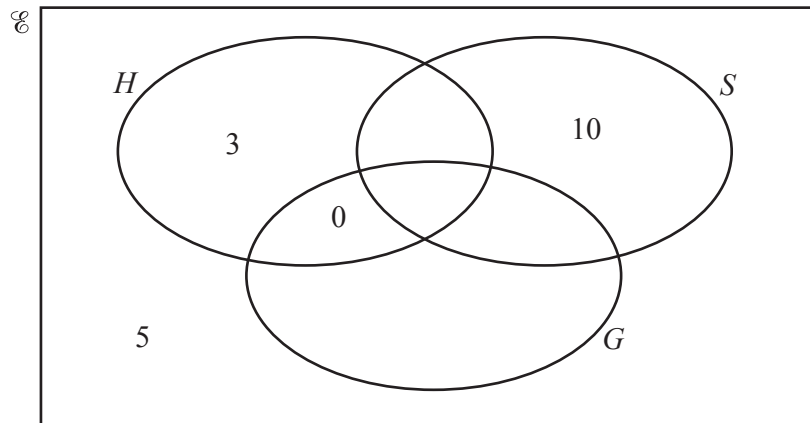
(b) (i) Solve $x^2 - 3x = 0$.

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]

(ii) Find the value of y when $x > 0$.

$y = \dots\dots\dots$ [2]

- 23 A shop sells hats (H), scarves (S) and gloves (G).
A group of 40 people are asked which items they buy in the shop.
Some of the results are shown in the Venn diagram.



- (a) 2 people buy all three items.
Those people that buy both a hat and a scarf also buy gloves.
4 people buy exactly two items.

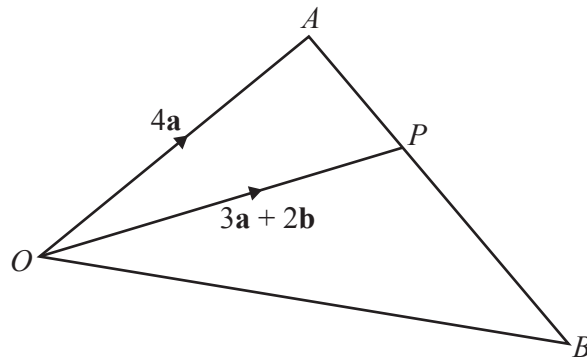
Use this information to complete the Venn diagram.

[2]

- (b) Work out $n(S \cap (H \cup G)')$.

..... [1]

Question 24 is printed on the next page.

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SCALE OAB is a triangle. P lies on AB and $AP : PB = 2 : 3$. $\overrightarrow{OA} = 4\mathbf{a}$ and $\overrightarrow{OP} = 3\mathbf{a} + 2\mathbf{b}$.(a) Find, in terms of \mathbf{a} and \mathbf{b} , giving your answer in its simplest form(i) \overrightarrow{AP} $\overrightarrow{AP} = \dots\dots\dots$ [1](ii) \overrightarrow{OB} . $\overrightarrow{OB} = \dots\dots\dots$ [3](b) Q is a point on OA such that \overrightarrow{QP} is parallel to \overrightarrow{OB} .Find \overrightarrow{QP} . $\overrightarrow{QP} = \dots\dots\dots$ [1]

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