Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0123456789

MATHEMATICS (SYLLABUS D) (MAURITIUS) **4029/02**

Paper 2 Calculator **For examination from 2025**

PRACTICE PAPER **2 hours**

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a scientific calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π, use either your calculator value or 3.142.

INFORMATION

- The total mark for this paper is 100.
- The number of marks for each question or part question is shown in brackets [ ].

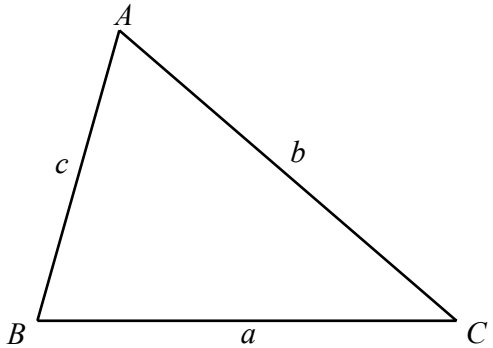
This document has **20** pages.

[Turn over

List of formulas

Area, A, of triangle, base b, height h.	$A = \frac{1}{2}bh$
Area, A, of circle of radius r.	$A = \pi r^2$
Circumference, C, of circle of radius r.	$C = 2\pi r$
Curved surface area, A, of cylinder of radius r, height h.	$A = 2\pi rh$
Curved surface area, A, of cone of radius r, sloping edge l.	$A = \pi rl$
Surface area, A, of sphere of radius r.	$A = 4\pi r^2$
Volume, V, of prism, cross-sectional area A, length l.	$V = Al$
Volume, V, of pyramid, base area A, height h.	$V = \frac{1}{3}Ah$
Volume, V, of cylinder of radius r, height h.	$V = \pi r^2 h$
Volume, V, of cone of radius r, height h.	$V = \frac{1}{3}\pi r^2 h$
Volume, V, of sphere of radius r.	$V = \frac{4}{3}\pi r^3$
For the equation $ax^2 + bx + c = 0$, where $a \neq 0$,	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

For the triangle shown,



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

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

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

1 $y = mx + c$

Find the value of y when $m = -3$, $x = -2$ and $c = -8$.

$y =$ ..... [2]

2 Write down the reciprocal of $\frac{1}{8}$.

..... [1]

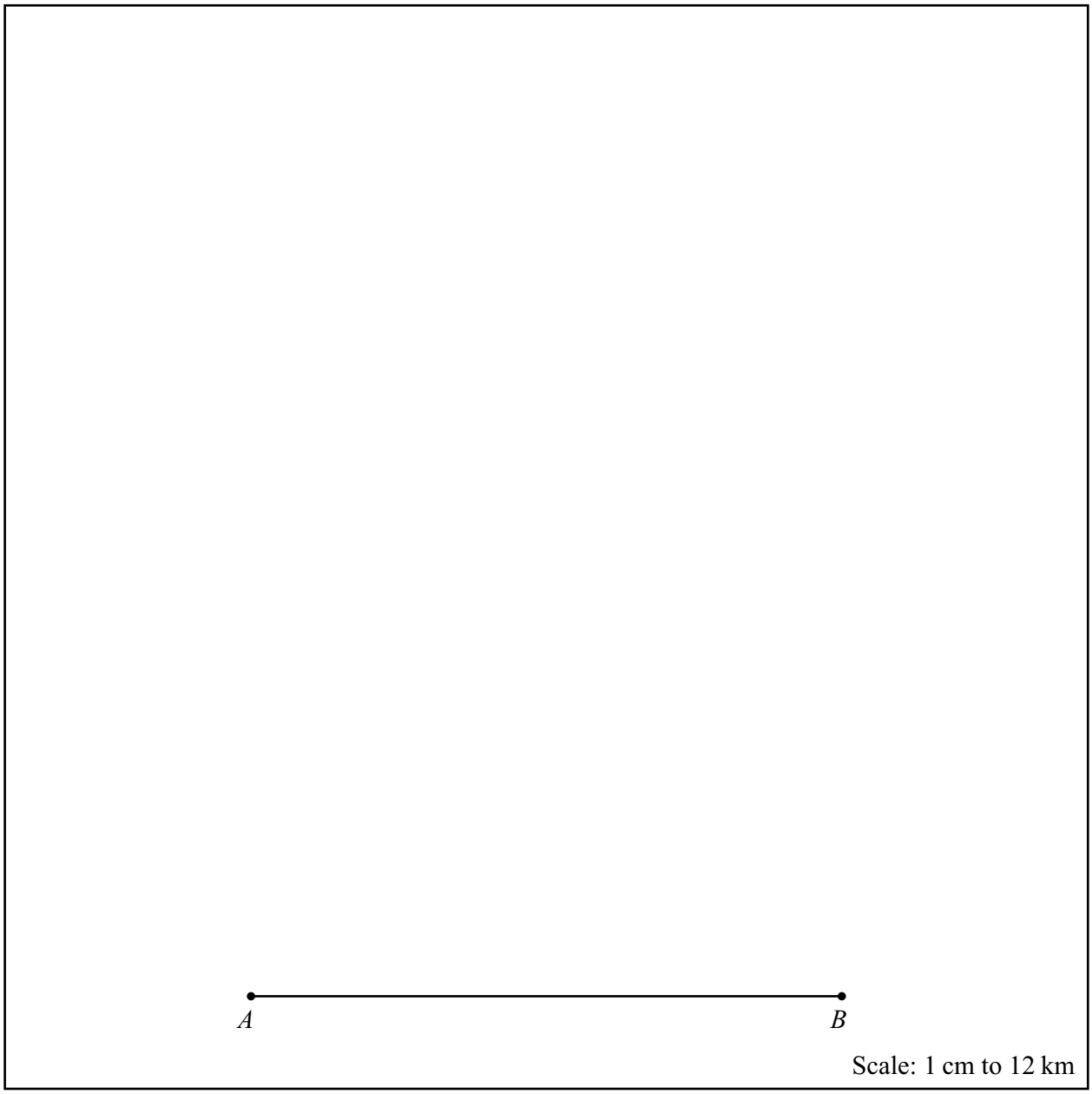
3 Divide \$24 in the ratio 7 : 5.

\$..... : \$..... [2]

4 Write \$24.60 as a fraction of \$2870.
Give your answer in its lowest terms.

..... [2]

5 The scale drawing shows the positions of both town *A* and town *B*.
The scale of the drawing is 1 cm to 12 km.



(a) Find the actual distance between town *A* and town *B*.

..... km [2]

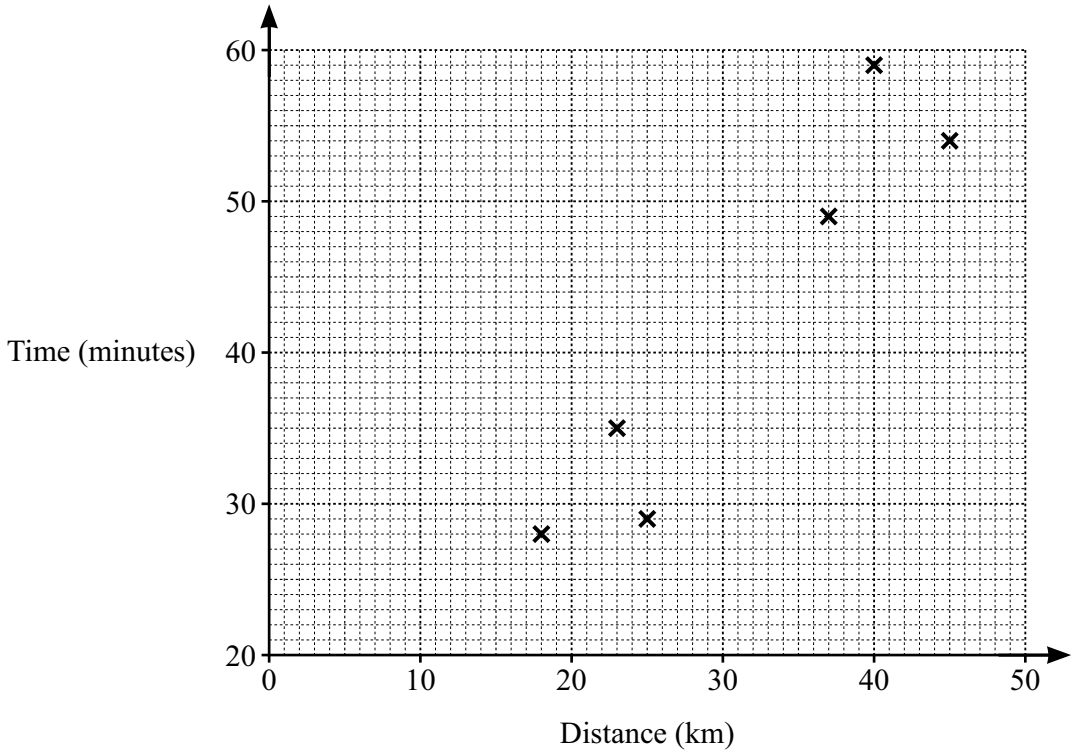
(b) Town *C* is 72 km from town *A* and 96 km from town *B*.

Using a ruler and a pair of compasses only, construct the position of town *C* on the scale drawing. [3]

6 The table shows the distances 12 people drive to work and the times they take.

Distance (km)	40	23	37	18	25	45	35	20	32	35	22	39
Time (minutes)	59	35	49	28	29	54	40	29	40	48	33	46

(a)



Complete the scatter diagram.
The first six points have been plotted for you. [2]

(b) What type of correlation does the scatter diagram show?

..... [1]

(c) On the scatter diagram, draw a line of best fit. [1]

(d) Another person drives a distance of 30 km to work.

Use your line of best fit to estimate how many minutes they take.

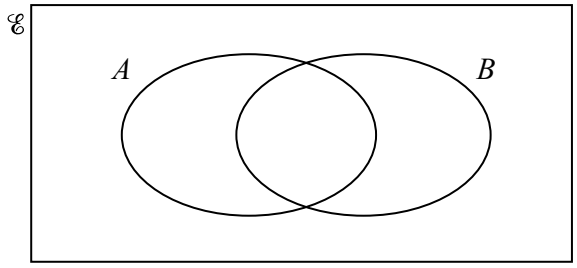
..... minutes [1]

7 Dean invests \$500 for 10 years at a rate of 1.7% per year simple interest.

Calculate the total interest Dean earns during the 10 years.

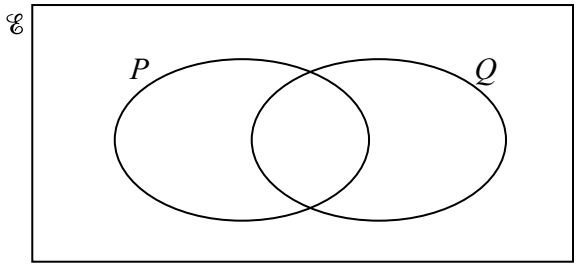
\$ ..... [2]

8 **(a)**



On the Venn diagram, shade the region $A \cap B$. [1]

(b) $\mathscr{E} = \{1, 2, 3, 4, 5, 6\}$
$P = \{x : x \text{ is an even number}\}$
$Q = \{x : x \text{ is a prime number}\}$



Complete the Venn diagram. [2]

9 Solve.

$$8x + 3 = 4x - 5$$

$x =$ ..... [2]

10 Write 2^{-4} as a decimal.

..... [1]

11 A plane flies from Melbourne to Tokyo at an average speed of 783 km/h.
The distance from Melbourne to Tokyo is 8352 km.

The plane leaves Melbourne at 09 52 local time.
The local time in Tokyo is 2 hours behind the local time in Melbourne.

Find the local time in Tokyo when the plane arrives.

..... [4]

12 Factorise.

$12x^2 + 9x$

..... [2]

13 In a sale the original prices are reduced by 15%.

(a) The original price of a book is \$12.

Calculate the sale price of the book.

\$ ..... [2]

(b) The sale price of a jacket is \$38.25 .

Calculate the original price of the jacket.

\$ ..... [2]

14 FC, United and City are football teams.

FC scored x goals.
United scored 8 goals more than FC.
City scored 3 goals fewer than twice the number of goals scored by FC.

The three teams scored a total of 117 goals.

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

$x =$ ..... [4]

15 Simplify.

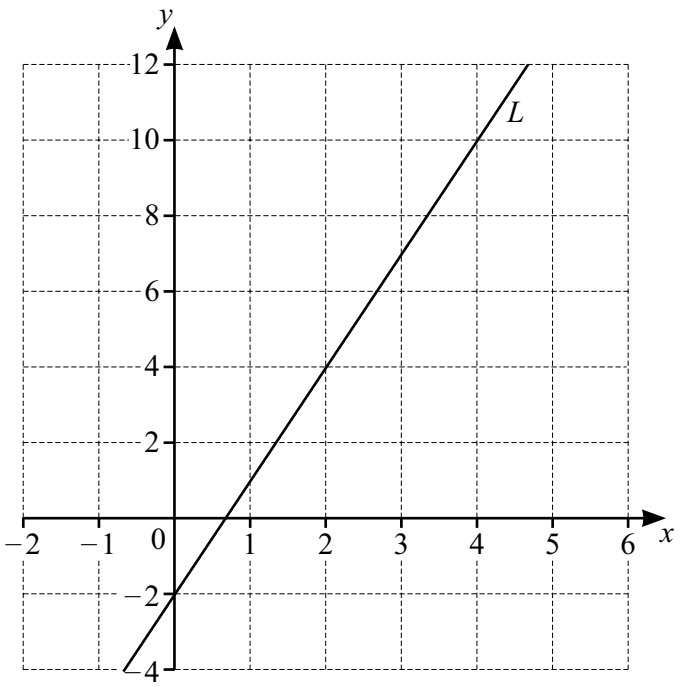
(a) $\frac{p}{2q} \times \frac{4pq}{t}$

..... [2]

(b) $(4x^3)^4$

..... [2]

16



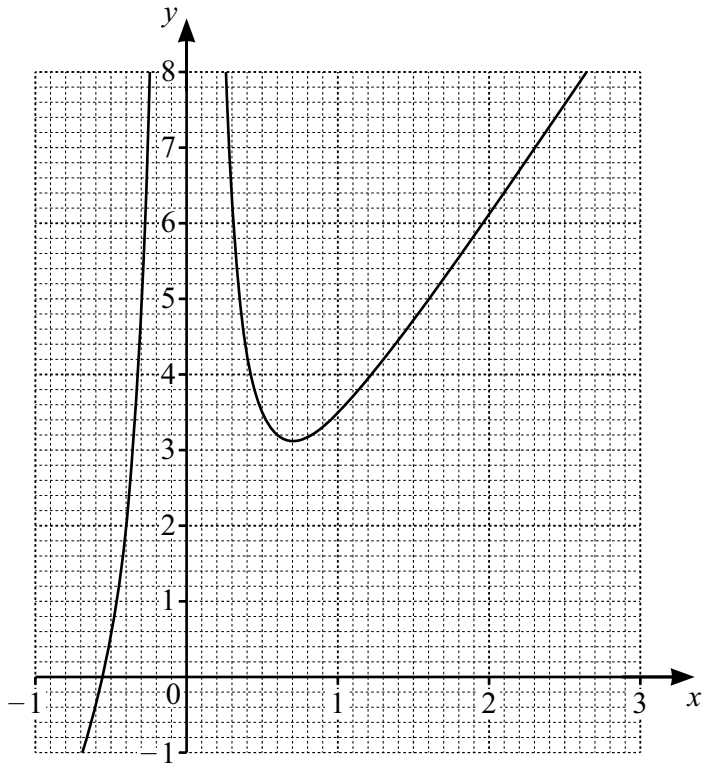
(a) Find the gradient of line L.

..... [2]

(b) Write down the equation of line L in the form $y = mx + c$.

$y =$ ..... [1]

17



The diagram shows the graph of $y = \frac{1}{2x^2} + 3x$ for $-1 \leqslant x \leqslant 3$.

(a) By drawing a tangent, estimate the gradient of the curve at $x = 0.5$.

..... [2]

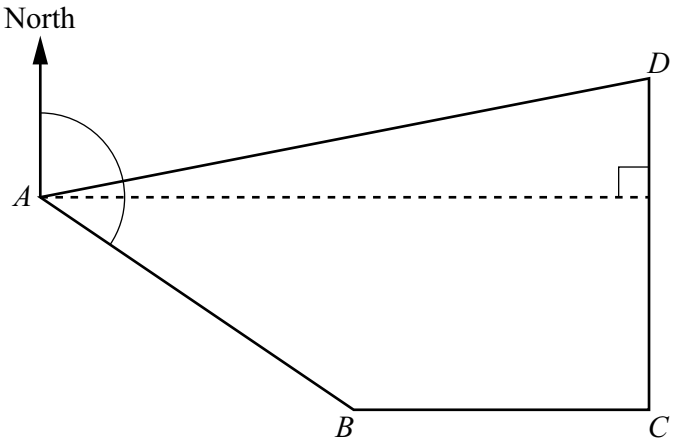
(b) Use the graph to estimate the solution of the equation $\frac{1}{2x^2} + 3x = 2$.

$x =$ ..... [1]

(c) By drawing a suitable line on the grid, estimate the solutions of the equation $\frac{1}{2x^2} = 7 - 4x$.

$x =$ ..... , $x =$ ..... , $x =$ ..... [4]

18 The diagram shows a field *ABCD*.



NOT TO SCALE

The bearing of *B* from *A* is 140°.
C is due east of *B*.
D is due north of *C*.
AB = 400 m, *BC* = 350 m and *CD* = 450 m.

(a) Find the bearing of *D* from *B*.

..... [3]

(b) Calculate the distance from D to A.

..... m [6]

19 The speed of each of 200 cars passing a building is measured.
The table shows the results.

Speed (v km/h)	$0 < v \leqslant 20$	$20 < v \leqslant 40$	$40 < v \leqslant 45$	$45 < v \leqslant 50$	$50 < v \leqslant 60$	$60 < v \leqslant 80$
Frequency	16	34	62	58	26	4

(a) Calculate an estimate of the mean.

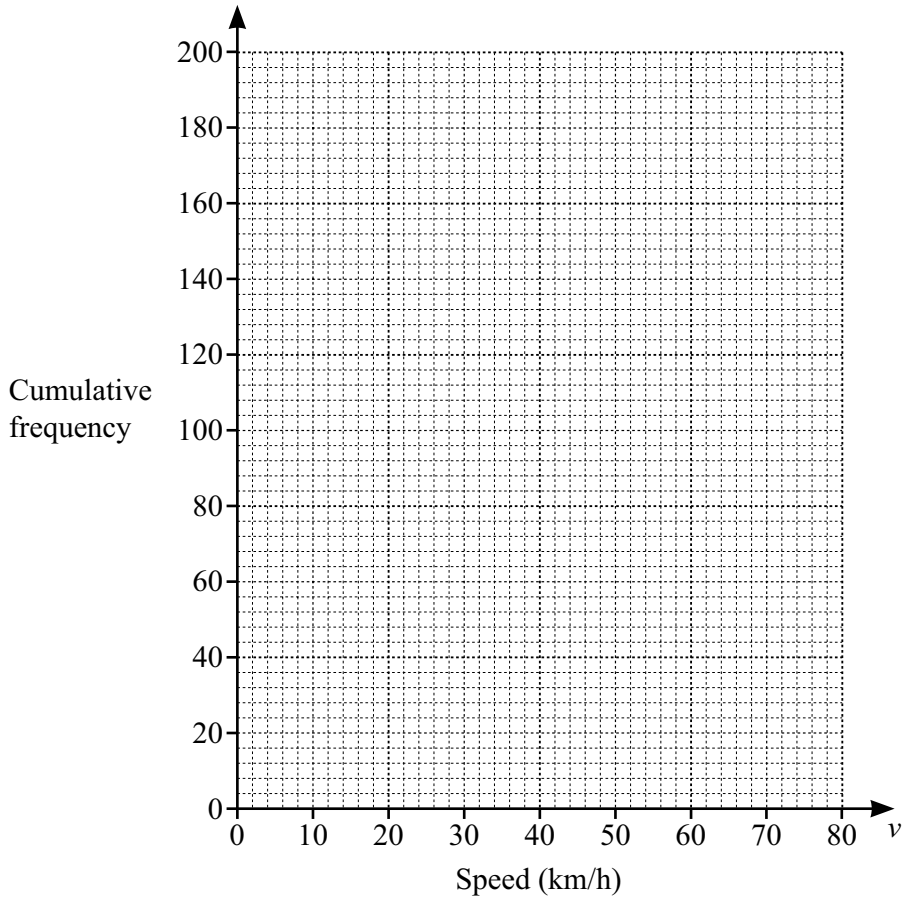
..... km/h [4]

(b) **(i)** Use the frequency table to complete the cumulative frequency table.

Speed (v km/h)	$v \leqslant 20$	$v \leqslant 40$	$v \leqslant 45$	$v \leqslant 50$	$v \leqslant 60$	$v \leqslant 80$
Cumulative frequency	16	50			196	200

[1]

(ii) On the grid, draw a cumulative frequency diagram.

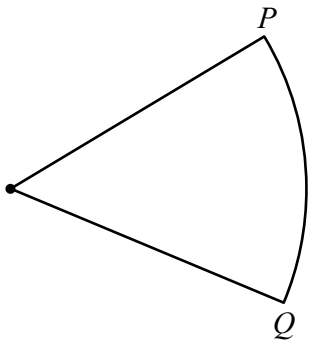


[3]

(iii) Use your diagram to find an estimate of the number of cars with a speed greater than 35 km/h.

..... [2]

20



NOT TO SCALE

The diagram shows a sector of a circle of radius 8 cm.
The length of the arc PQ is 6.4 cm.

Find the area of the sector.

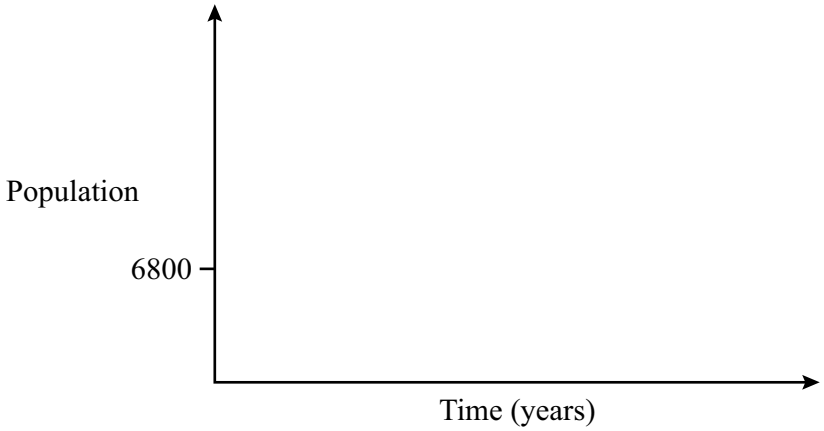
..... cm^2 [4]

21 The population of a village is 6800.
The population of the village increases exponentially at a rate of r% per year.
At the end of 5 years the population of the village is 8353.

(a) Calculate the value of r.

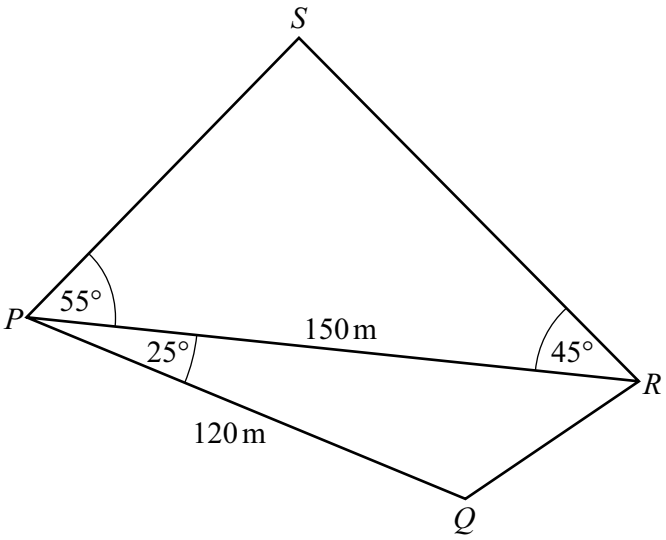
..... [3]

(b) Sketch a graph to show how the population of the village changes with time.



[1]

22 The diagram shows two triangles.



NOT TO SCALE

(a) Calculate *RS*.

RS = ... m [4]

(b) Calculate the total area of the two triangles.

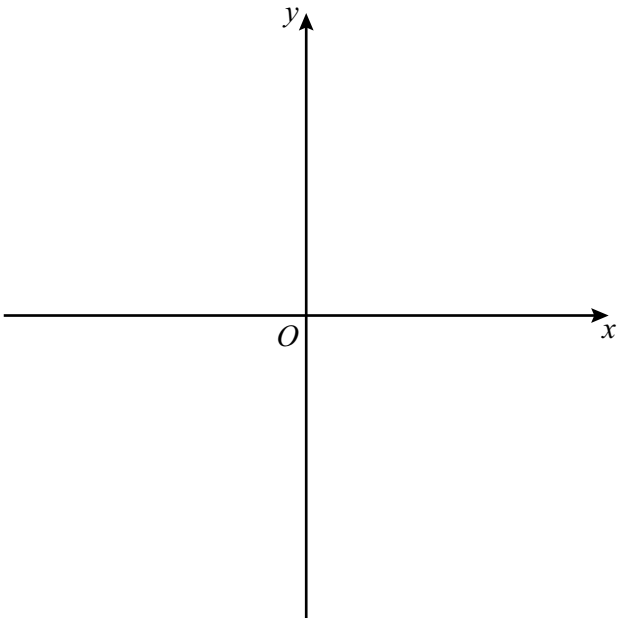
..... m^2 [3]

23 **(a)** Factorise.

$$2x^3 - 3x^2 - 20x$$

..... [3]

(b) Sketch the graph of $y = 2x^3 - 3x^2 - 20x$.
Write down the x-coordinates of the points where the graph crosses the x-axis.



[3]

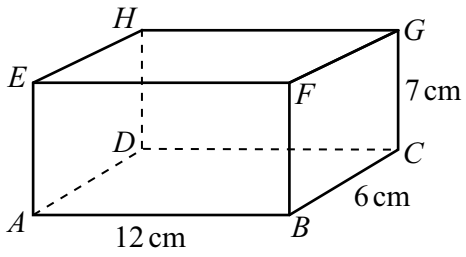
Questions 24 and 25 are printed on the next page.

24 Expand and simplify.

$$(x + 3)(x - 5)(3x - 1)$$

..... [3]

25



NOT TO SCALE

The diagram shows a cuboid.

Calculate the angle between BH and the face $BCGF$.

..... [4]

