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MATHEMATICS**0580/33**

Paper 3 Calculator (Core)

May/June 2025**1 hour 30 minutes**

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 80.
- The number of marks for each question or part question is shown in brackets [].

This document has **20** pages. Any blank pages are indicated.

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 .

$$V = \frac{4}{3}\pi r^3$$





3

1

2	6	16	18	24	26	27	33
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From this list, write down the number that is

(a) a multiple of 12

..... [1]

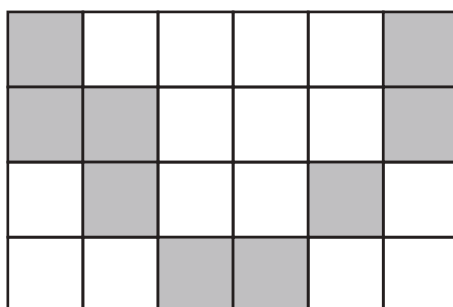
(b) a square number

..... [1]

(c) a cube number.

..... [1]

2



Shade one square so that the diagram has 1 line of symmetry.

[1]

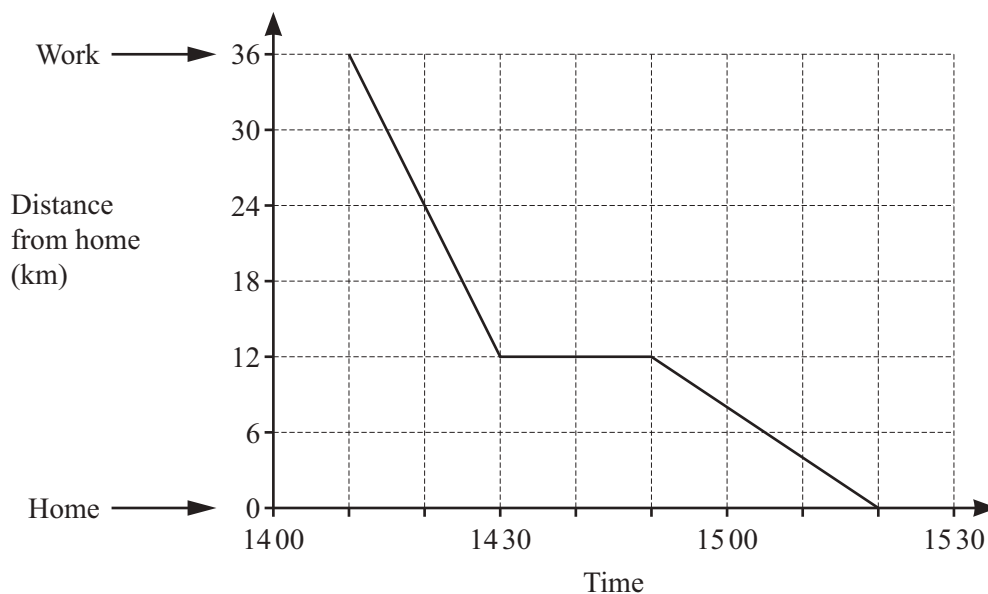
3 Put **one** pair of brackets into this calculation to make it correct.

$$80 \div 8 + 2 \times 3 = 24$$

[1]



- 4 Tim drives home from work.
The travel graph shows his journey.



- (a) Write down the time Tim leaves work.

..... [1]

- (b) Tim stops on the way home.

- (i) Find how far Tim travels before he stops.

..... km [1]

- (ii) Find how long Tim stops for.

..... min [1]

- 5 Calculate.

$$\frac{2.8^5 - 0.3^2}{\sqrt{5}}$$

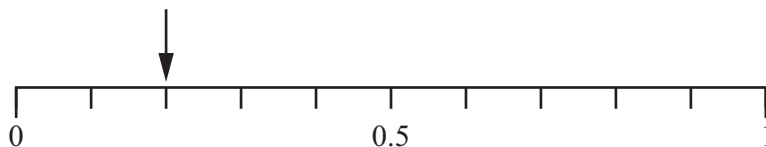
Give your answer correct to 2 decimal places.

..... [2]



- 6 In a bag of counters, 6 of the counters are blue.

The arrow (↓) on the probability scale shows the probability of picking a blue counter at random.



Work out the total number of counters in the bag.

..... [1]

- 7 The local time in Japan is $3\frac{1}{2}$ hours ahead of the local time in India.

Find the time in Japan when it is 21 45 in India.

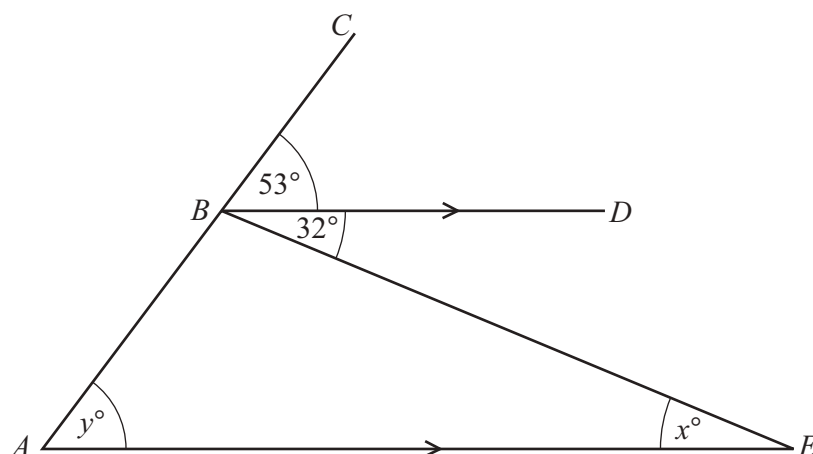
..... [1]

- 8 Mia changes \$350 into euros.
The exchange rate is \$1 = 0.92 euros.

Calculate the amount Mia receives.

..... euros [1]





NOT TO
SCALE

ABC is a straight line.

BD is parallel to AE .

- (a) Find the value of x .
Give a geometrical reason for your answer.

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

- (b) Find the value of y .
Give a geometrical reason for your answer.

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



10 Solve.

$$4p + 11 = 25$$

$$p = \dots\dots\dots [2]$$

11 (a) Expand and simplify.

$$5(x - 2) + 3(x - 7)$$

$$\dots\dots\dots [2]$$

(b) Factorise.

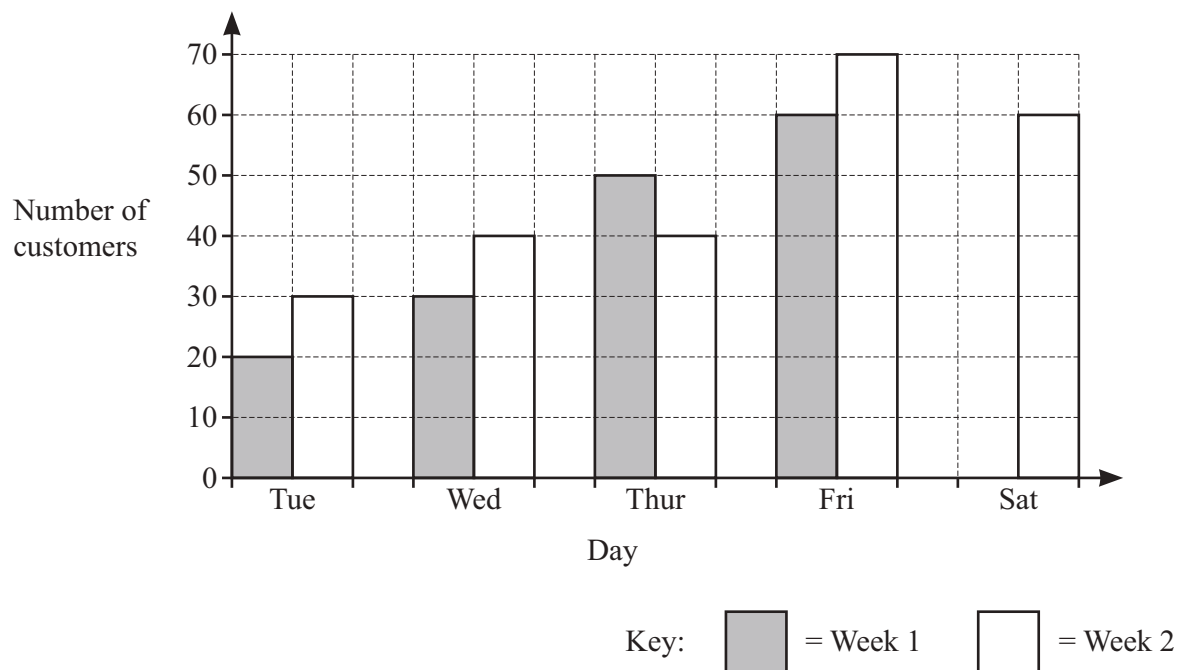
$$4a^2 + 16a$$

$$\dots\dots\dots [2]$$



- 12 Kai opens his restaurant from Tuesday to Saturday each week. He counts the number of customers each day for two weeks.

The bar chart shows some of the results.



- (a) In week 1 there were 200 customers in total.

Complete the bar chart.

[2]

- (b) Write down the mode for week 2.

..... [1]

- (c) Find the mean number of customers for the 5 days in week 2.

..... [2]



- 13 In May a shop makes a profit of \$542.
In June the shop makes a profit of \$600.

(a) Calculate the percentage increase in the profit from May to June.

..... % [2]

- (b) The shop gives $\frac{2}{5}$ of the profit from May to a charity.

Find the amount the shop gives to the charity.

\$ [1]

- (c) The shop spends 38% of the profit from June on a fridge.

Find the amount the shop spends on the fridge.

\$ [1]

- 14 Meg invests \$2500 at a rate of 4.6% per year simple interest.

Calculate the total amount of her investment at the end of 3 years.

\$ [3]



- 15 The table gives information about the costs of hiring bikes.

Type of bike	Cost for first day	Cost for each extra day
Road	\$25	\$20
Mountain	\$40	\$35
Electric	\$70	\$50

- (a) Work out the cost of hiring 2 road bikes for 3 days.

\$ [2]

- (b) The cost, M , of hiring a mountain bike for d days can be written as $M = 35d + 5$.

- (i) Write a formula for the cost, E , of hiring an electric bike for d days.

$E =$ [2]

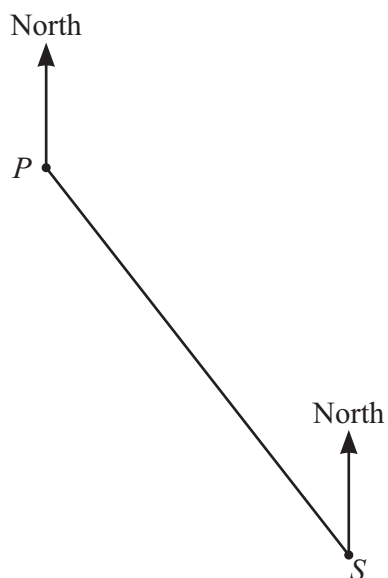
- (ii) The cost of hiring an electric bike for 6 days is the same as the cost of hiring a mountain bike for d days.

Find the value of d .

$d =$ [3]



- 16 The scale drawing shows a path from S to P .
The scale is 1 cm represents 2.5 km.



Scale: 1 cm to 2.5 km

- (a) Work out the actual distance between S and P .

..... km [2]

- (b) Measure the bearing of S from P .

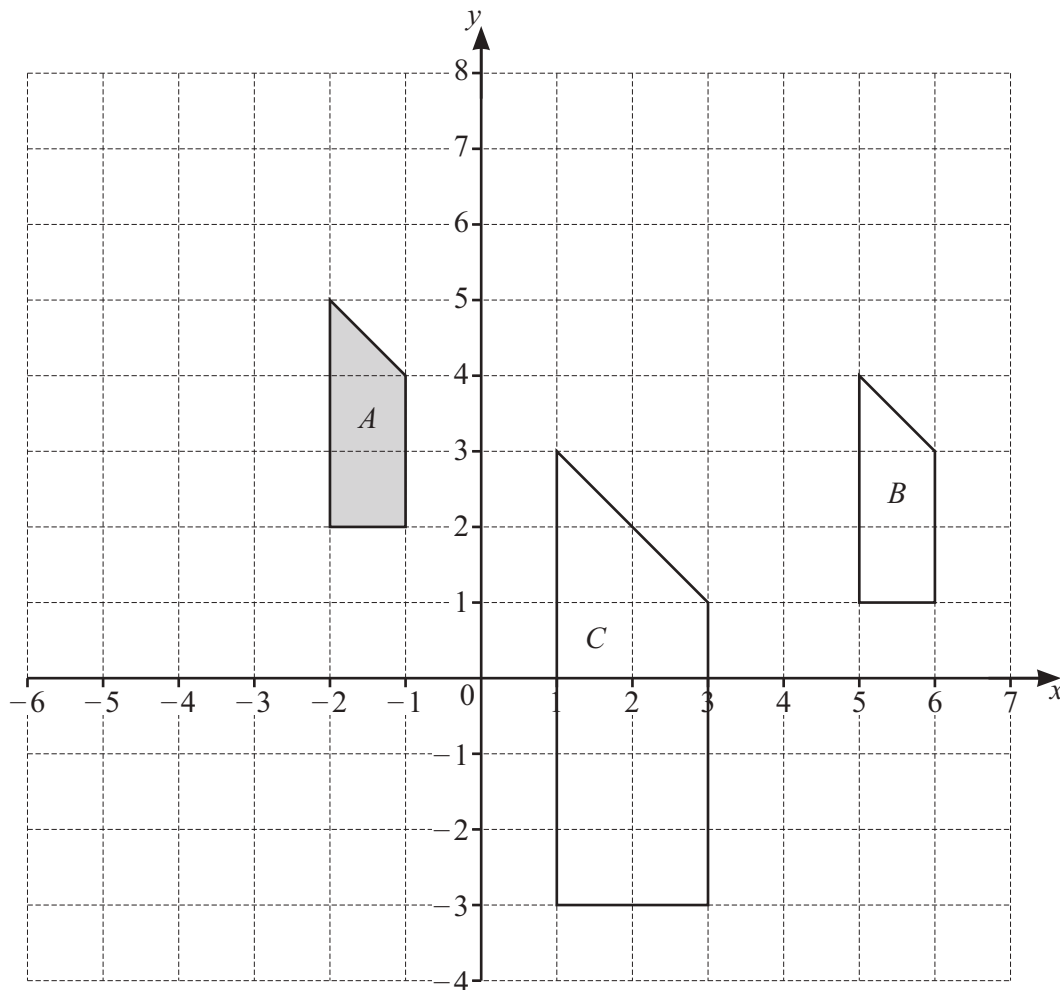
..... [1]

- (c) E is 20 km from P on a bearing of 070° .

On the scale drawing, mark the position of E .

[2]





- (a) Sue describes the **single** transformation that maps shape *A* onto shape *B* as a translation by the vector $\begin{pmatrix} 7 \\ 1 \end{pmatrix}$.

Explain why Sue is incorrect.

..... [1]

- (b) On the grid, draw the image of shape *A* after a rotation of 90° anticlockwise about $(0, 0)$. [2]

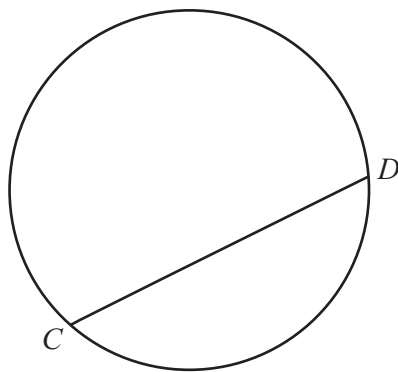
- (c) Describe fully the **single** transformation that maps shape *A* onto shape *C*.

..... [3]





18 (a)

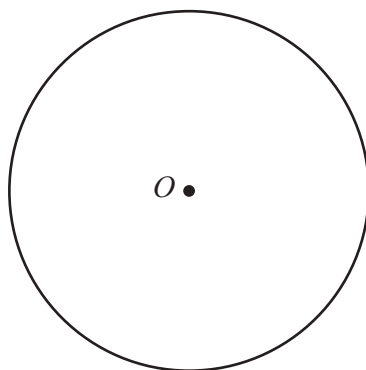


Points C and D lie on the circle.

Write down the mathematical name for the line CD .

..... [1]

(b) The diagram shows a circle with centre O .



Points K , L and M lie on the circumference of the circle.

Draw triangle KLM so that angle $KLM = 90^\circ$. [1]



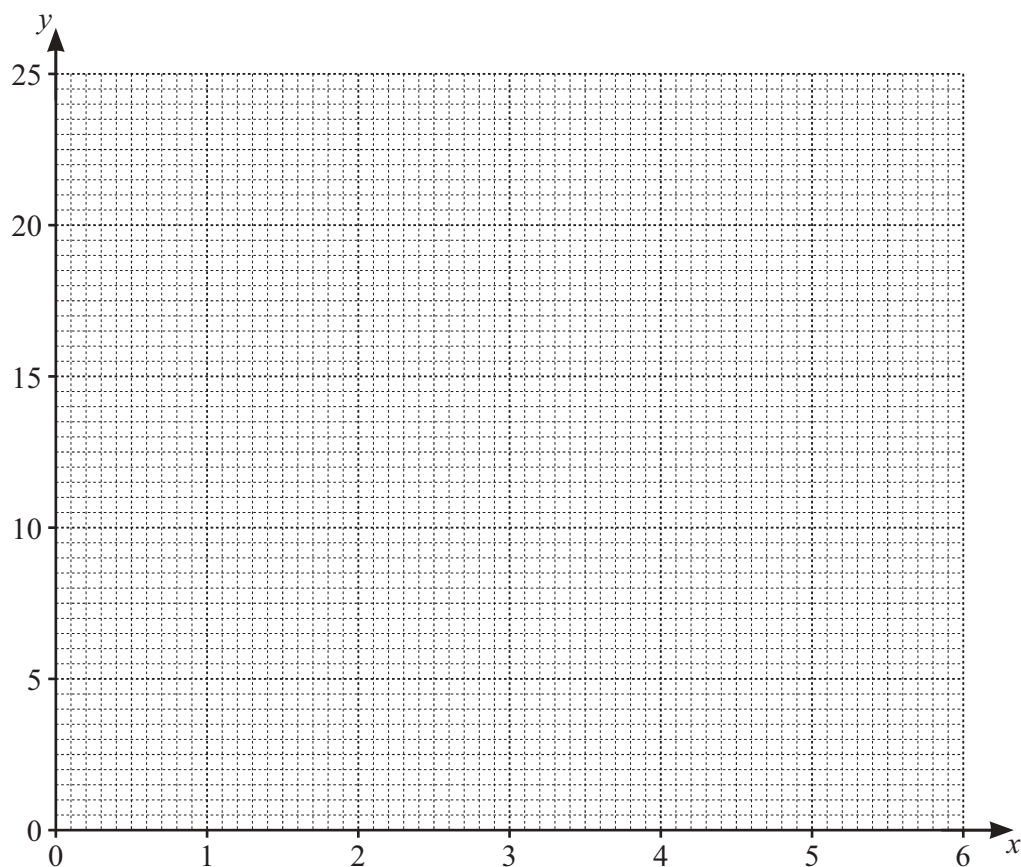


- 19 (a) Complete the table of values for $y = \frac{20}{x}$.

x	1	2	3	4	5
y	20	10			4

[2]

- (b) On the grid, draw the graph of $y = \frac{20}{x}$ for $1 \leq x \leq 5$.



[3]

- (c) Use your graph to solve the equation $\frac{20}{x} = 8$.

$x = \dots\dots\dots$ [1]



20 A spinner is numbered 1, 2, 3, 4 and 5.

Rinesh spins the spinner many times.

He works out the relative frequency that the spinner lands on each number.

Number	1	2	3	4	5
Relative frequency	0.15	0.22		0.26	0.25

(a) Complete the table.

[2]

(b) Rinesh spins the spinner another 1500 times.

Calculate the expected number of times the spinner lands on 2.

..... [1]





- 21 (a) These are the distances above the surface of the Earth of five satellites, A , B , C , D and E . Each distance is in kilometres.

A	B	C	D	E
35 800	7.8×10^2	1.5×10^6	535	2×10^4

- (i) Write these distances in order, starting with the shortest.

.....,,,, [2]
shortest

- (ii) The radius of Earth is 6370 km.
 Satellite A is k times further from the **centre** of Earth than satellite D .

Show that $k = 6.11$ correct to 2 decimal places.

[2]

- (b) A satellite travels at a speed of 27 000 km/h.

Find the distance the satellite travels in 95 minutes.

..... km [2]

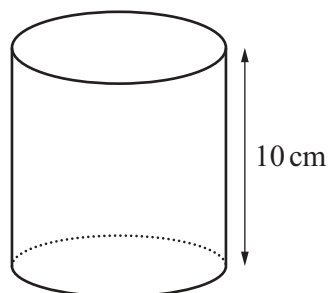
- (c) A different satellite travels at a speed of 25 200 km/h.

Convert this speed into m/s.

..... m/s [2]



22 The diagram shows a solid cylinder with height 10 cm.



NOT TO
SCALE

The volume of the cylinder is 478 cm^3 .

(a) Find the radius of the cylinder.

..... cm [3]

(b) The cylinder is made from gold.
The density of the gold is 19.3 g/cm^3 .

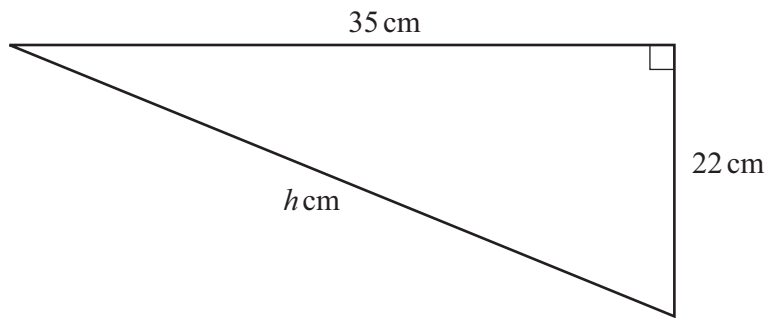
Calculate the mass of the cylinder.

$$\left[\text{Density} = \frac{\text{mass}}{\text{volume}} \right]$$

..... g [1]



- 23 The diagram shows a right-angled triangle.

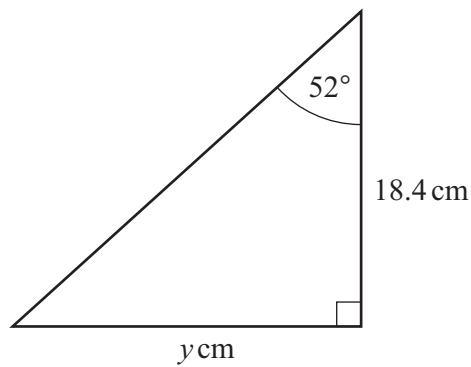


NOT TO
SCALE

Calculate the value of h .

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

- 24 The diagram shows a right-angled triangle.



NOT TO
SCALE

Calculate the value of y .

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