Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

MATHEMATICS **0580/12**

Paper 1 (Core) **February/March 2020**

1 hour

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 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 56.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **12** pages. Blank pages are indicated.

1 **(a)** Write 3.25 pm in the 24-hour clock.

15 25 ..... [1]

(b) Work out the time 7 hours and 36 minutes before 13 26.

hrs. mins.

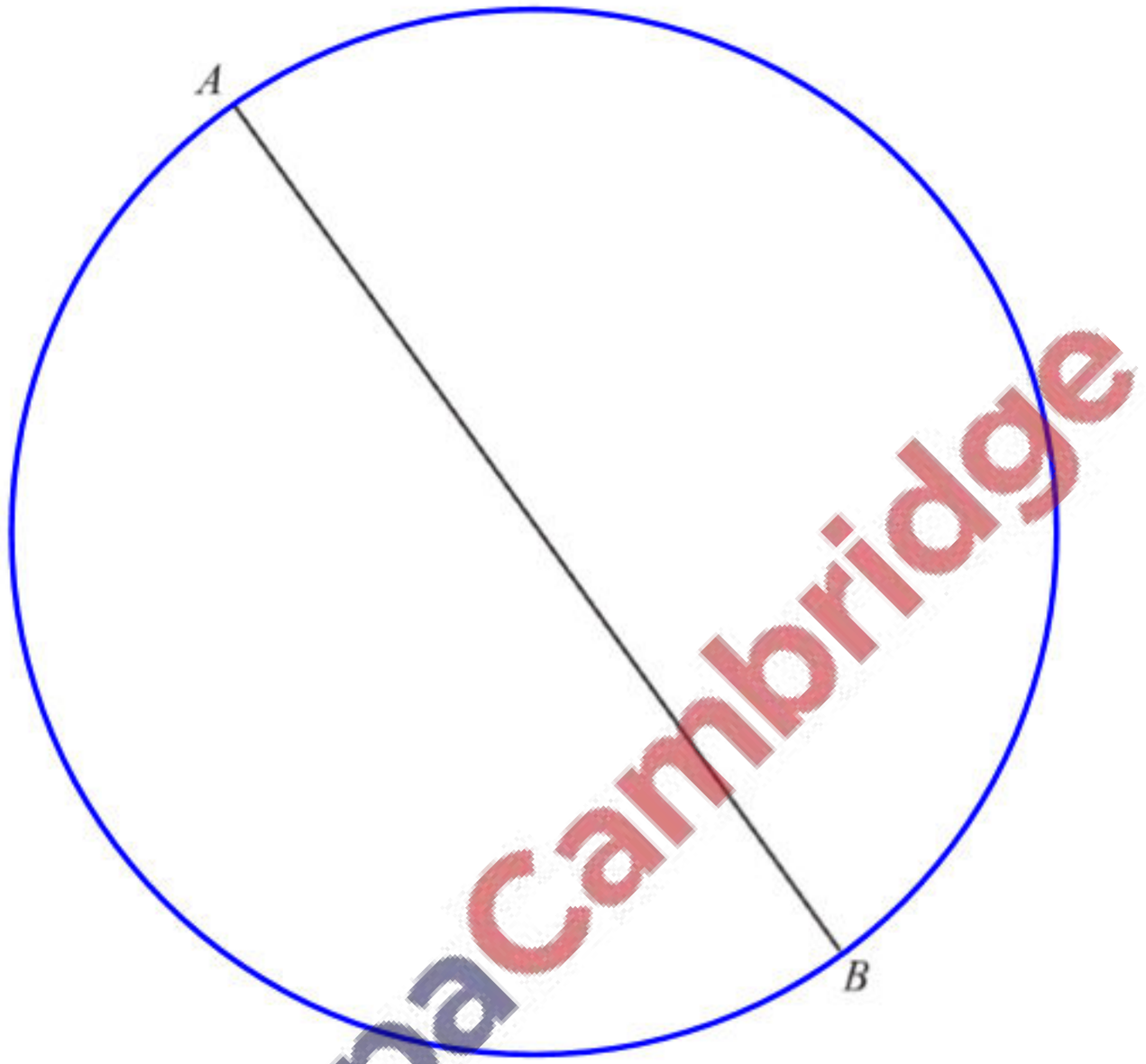
12 13 26 86

− 7 36

5 50

05 50 ..... [1]

2



(a) Measure the length of the line *AB* in millimetres.

94 ..... mm [1]

(b) *AB* is the diameter of a circle.

Draw this circle. [2]

3 **(a)** The temperature on Monday was −7 °C.
The temperature on Tuesday was 5 °C lower than on Monday.
The temperature on Wednesday was 8 °C higher than on Tuesday.

Find the temperature on Wednesday.

* $T_{TUESDAY} = -7°C - 5°C = -12°C$

* $T_{WEDNESDAY} = -12°C + 8°C = -4°C$ //

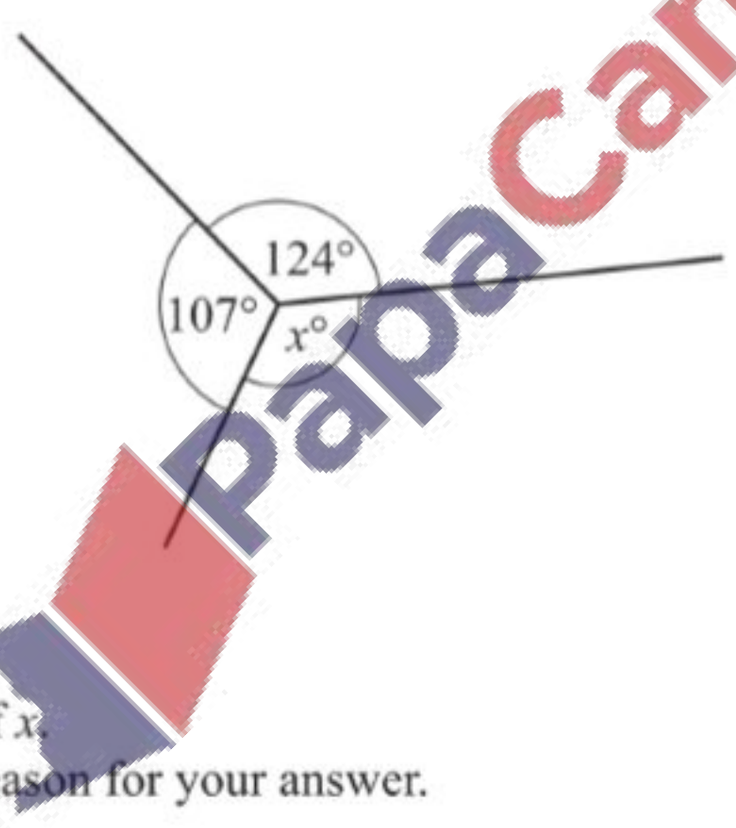
-4 °C [2]

(b) Kyra has a faulty thermometer.
It always shows the temperature as 2 °C higher than the actual temperature.
The temperature on the thermometer is T°C.

Write an expression, in terms of T, for the actual temperature.

T − 2 °C [1]

4



NOT TO SCALE

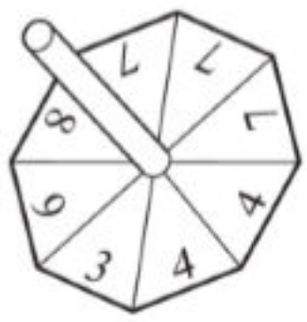
Work out the value of x.
Give a geometrical reason for your answer.

* $x + 107° + 124° = 360°$

$\Rightarrow x = 129°$ //

$x =$ 129° because Angles formed at a point add up to 360° [2]

5 The diagram shows a fair 8-sided spinner.



The numbers on the spinner are 3, 4, 4, 7, 7, 7, 8 and 9.

(a) The spinner is spun once.

Write down the probability that the spinner lands on

(i) the number 7,

3/8 ..... [1]

(ii) a number greater than 2.

1 ..... [1]

(b) The spinner is spun 160 times.

Work out the expected number of times the spinner lands on the number 7.

* $N = \frac{3}{8} \times 160 = 60$ //

60 ..... [1]

6 The month of July has 31 days.

Calculate the number of seconds in the month of July.

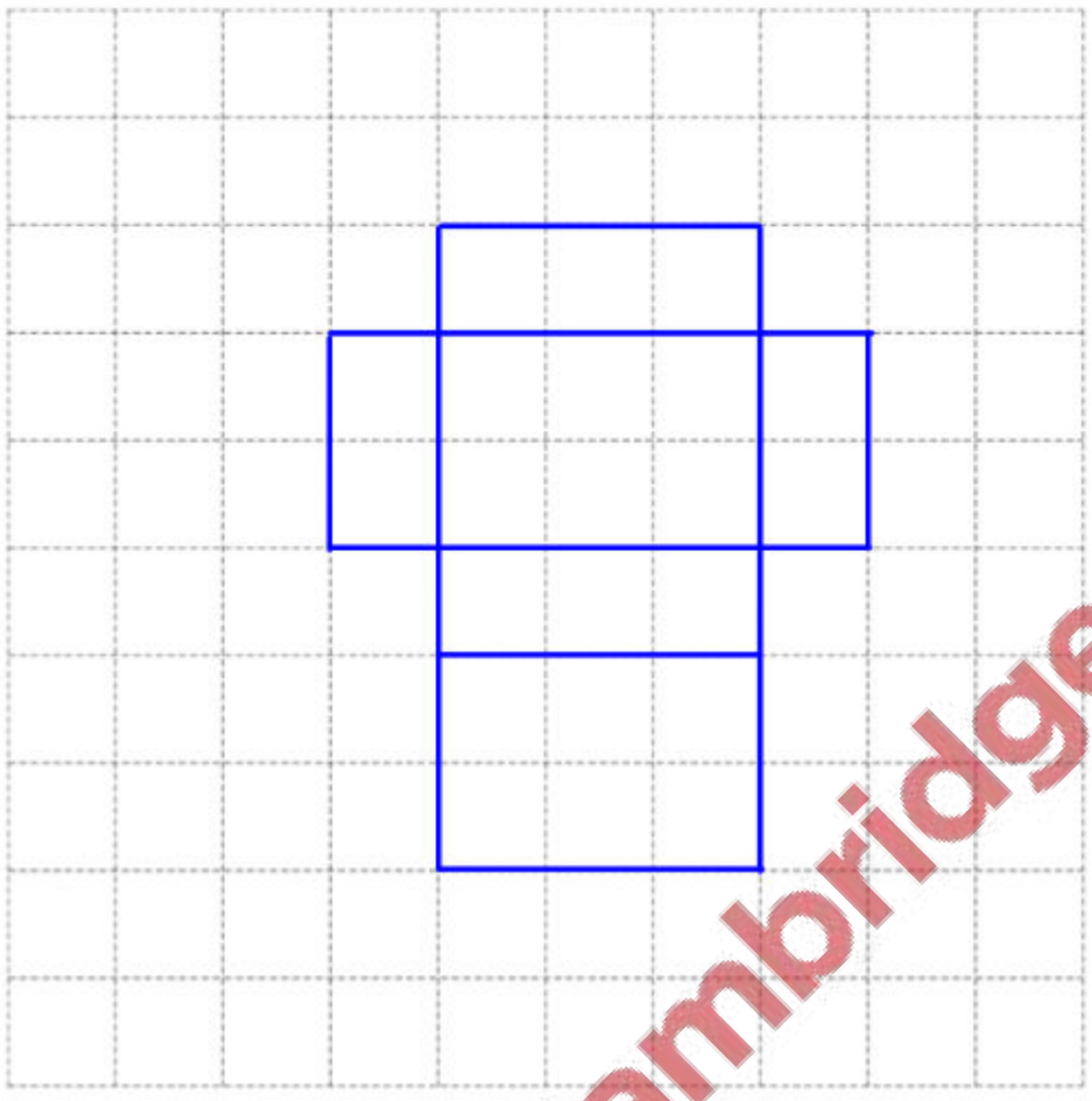
* $N_{SECONDS\ (July)} = 31\ \cancel{days} \times 24\ \frac{hr}{\cancel{day}} \times 3600\ \frac{s}{\cancel{hr}}$

$= 2\,678\,400\ s$ //

2 678 400 ..... seconds [2]

7 A cuboid has length 3 cm, width 2 cm and height 1 cm.

On the 1 cm^2 grid, draw a net of the cuboid.



[3]

8 **(a)** Write down the reciprocal of 40.

$\frac{1}{40}$ [1]

(b) Calculate $\sqrt[3]{40}$.
Give your answer correct to 4 decimal places.

3.4200 [2]

(c) Write the number 40 in standard form.

4.0

4.0×10^1

4.0×10^1 [1]

9 **(a)** Write down the gradient of the line $y = 2x - 3$.

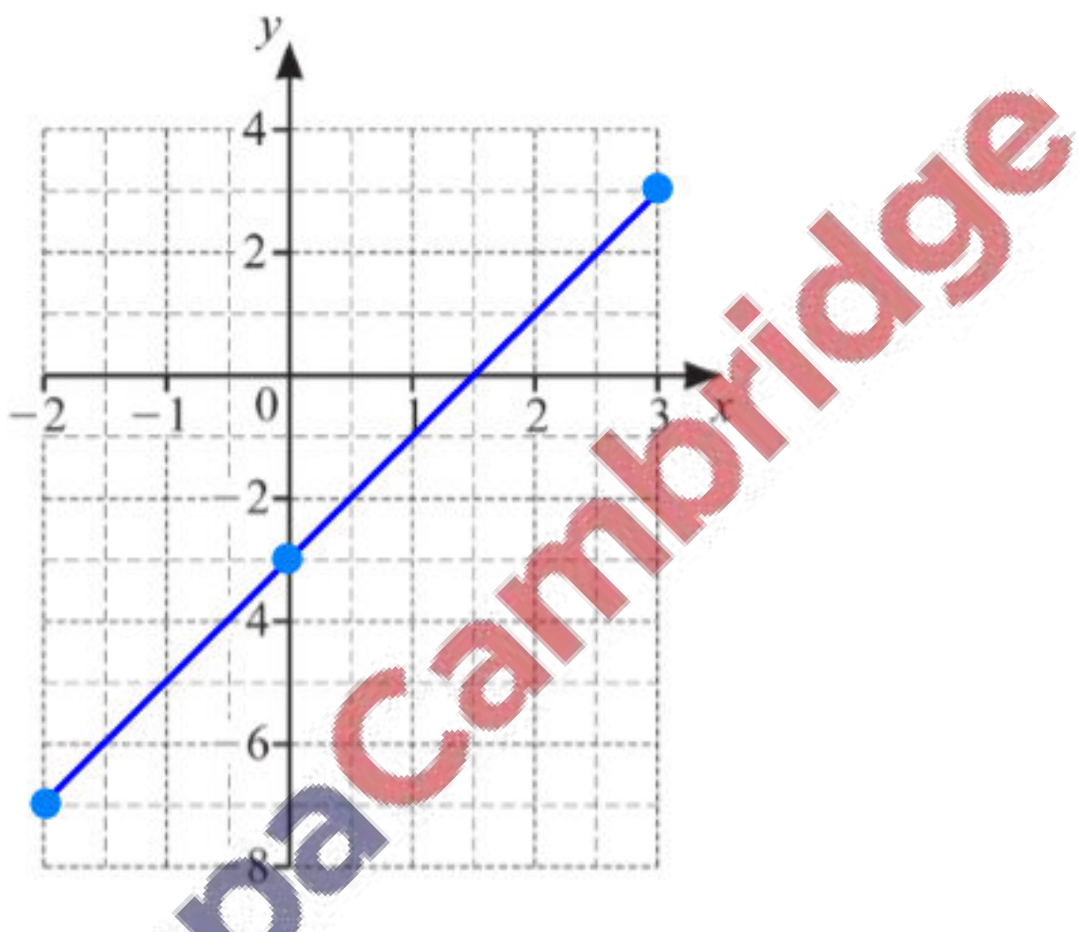
2 [1]

(b) Complete the table of values for $y = 2x - 3$.

x	-2	0	3
y	-7	-3	3

[2]

(c) On the grid, draw the graph of $y = 2x - 3$ for $-2 \leqslant x \leqslant 3$.



[1]

10 Point A has coordinates (6, 4) and point B has coordinates (2, 7).

Write $\overrightarrow{AB}$ as a column vector.

* $\overrightarrow{AB} = \overrightarrow{OB} - \overrightarrow{OA}$

$\Rightarrow \overrightarrow{AB} = \begin{pmatrix} 2 \\ 7 \end{pmatrix} - \begin{pmatrix} 6 \\ 4 \end{pmatrix}$

$\Rightarrow \overrightarrow{AB} = \begin{pmatrix} -4 \\ 3 \end{pmatrix}$ //

$\overrightarrow{AB} = \begin{pmatrix} -4 \\ 3 \end{pmatrix}$ [1]

11 The number of people swimming in a pool is recorded each day for 12 days.

24	28	13	38	15	26
45	21	48	36	18	38

(a) Complete the stem-and-leaf diagram.

1	3, 5, 8
2	1, 4, 6, 8
3	6, 8, 8
4	5, 8

Key: 1|3 represents 13 swimmers

[2]

(b) Find the median number of swimmers.

* Median position = $\frac{1}{2}(12+1)$ th = 6.5 th,

* Median = $\frac{26+28}{2}$ = 27,

27 [1]

12 A bag contains red marbles, green marbles and blue marbles only.
The ratio of the number of marbles of each colour is

red : green : blue = 12 : 5 : 2.

There are 112 more red marbles than green marbles.

Work out the number of blue marbles.

Red	Green	Blue
12	5	2
112 + x	x	y

Finding x

$\Rightarrow 12x = 5(x+112)$

$\Rightarrow 12x = 5x + 560$

$\Rightarrow 7x = 560$

$\Rightarrow x = 80$,

Finding y

$\Rightarrow y = \frac{2x}{5}$

$\Rightarrow y = \frac{2(80)}{5} = 32$,

32 [2]

13 **Without using a calculator,** work out $\frac{15}{28} \div \frac{4}{7}$.

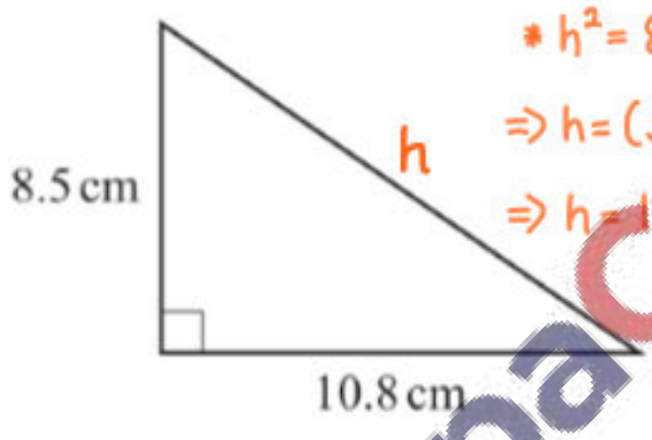
You must show all your working and give your answer as a fraction in its simplest form.

$\Rightarrow \frac{15}{\cancel{28}^{4}} \times \frac{\cancel{7}^{1}}{4}$

$\Rightarrow \frac{15}{16}$

$\frac{15}{16}$ ..... [3]

14



$* h^2 = 8.5^2 + 10.8^2$

$\Rightarrow h = (\sqrt{8.5^2 + 10.8^2})\text{ cm}$

$\Rightarrow h = 13.7437\ldots\text{ cm}$

NOT TO SCALE

The diagram shows a right-angled triangle.

(a) Calculate the area.

$* A = \frac{1}{2} \times b \times h$

$\Rightarrow A = \frac{1}{2} \times 10.8\text{ cm} \times 8.5\text{ cm} = 45.9\text{ cm}^2$

45.9 ..... cm^2 [2]

(b) Calculate the perimeter.

$* P = 8.5\text{cm} + 10.8\text{cm} + 13.7437\text{cm}$

$\Rightarrow P = 33.0\text{ cm}$ (3 sig. figs.)

33.0 ..... cm [3]

15 Riya invests \$30 000 at a rate of 2.5% per year compound interest.

Calculate the value of her investment at the end of 7 years.
Give your answer correct to the nearest dollar.

$* A = a\left(1+\frac{r}{100}\right)^t$

$\Rightarrow A = \$30\,000\left(1+\frac{2.5}{100}\right)^7$

$\Rightarrow A = \$35\,660.57\ldots \approx \$35\,661$ //

\$ 35 661 ..... [3]

16 **(a)** Simplify.

$5 \times x^0$

$\Rightarrow 5 \times 1 = 5$ //

5 ..... [1]

(b) $9^{12} \div 9^w = 9^4$

Find the value of w.

$\Rightarrow 9^{12-w} = 9^4$

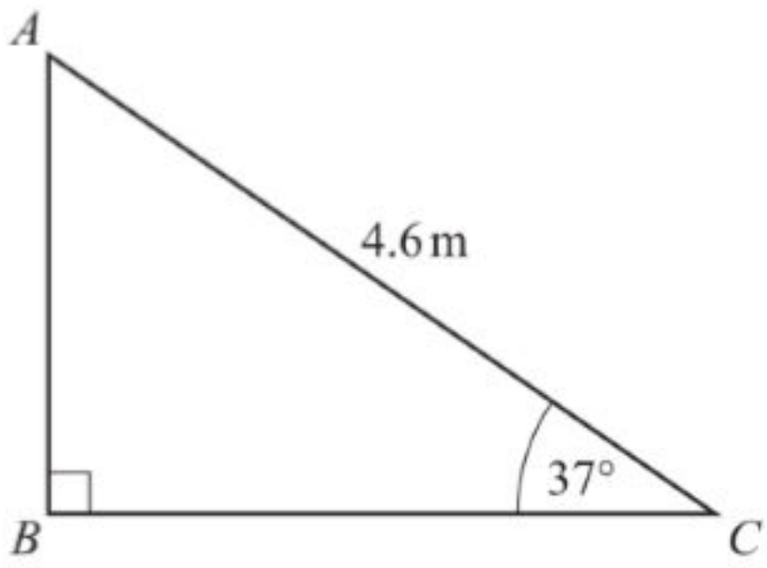
Since the bases are equal,

$\Rightarrow 12 - w = 4$

$\Rightarrow w = 8$ //

$w =$ 8 ..... [1]

17



NOT TO SCALE

The diagram shows a right-angled triangle ABC.

Calculate AB.

$\star \sin 87° = \frac{AB}{4.6m}$

$\Rightarrow AB = (4.6 \sin 87°)\,m$

$\Rightarrow AB = 2.77\,m$ (3 sig. figs.)

$AB =$ ..... 2.77 ..... m [2]

18 **(a)** Factorise completely.

$3x^2 - 12xy$

..... $3x(x-4y)$ ..... [2]

(b) Expand and simplify.

$(m-3)(m+2)$

$\Rightarrow m^2+2m-3m-6$

$\Rightarrow m^2-m-6$

..... m^2-m-6 ..... [2]

19 A car travels at a constant speed of 45 kilometres per hour for 5 minutes.
Each wheel of the car has radius 25 centimetres.

Calculate the number of complete revolutions that a wheel makes during the 5 minutes.

$\star\ n = \frac{d}{C}$

Finding d

$\star\ v = \frac{d}{t}$

$\Rightarrow d = 45\ \frac{km}{h} \times 5\ mins.$

$\Rightarrow d = 45\ \frac{km}{\cancel{h}} \times \frac{5}{60}\cancel{h} = 3.75\ km$

Finding C

$\star\ C = 2\pi r$

$\Rightarrow C = 2\pi(25cm) = 50\pi\ cm$

$\Rightarrow n = \frac{3.75 \times 10^5 \cancel{cm}}{50\pi\ \cancel{cm}}$

$\Rightarrow n = 2387.3\ldots \approx 2387$

2387 ..... [5]

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