Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

MATHEMATICS **0580/13**

Paper 1 (Core) **October/November 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.

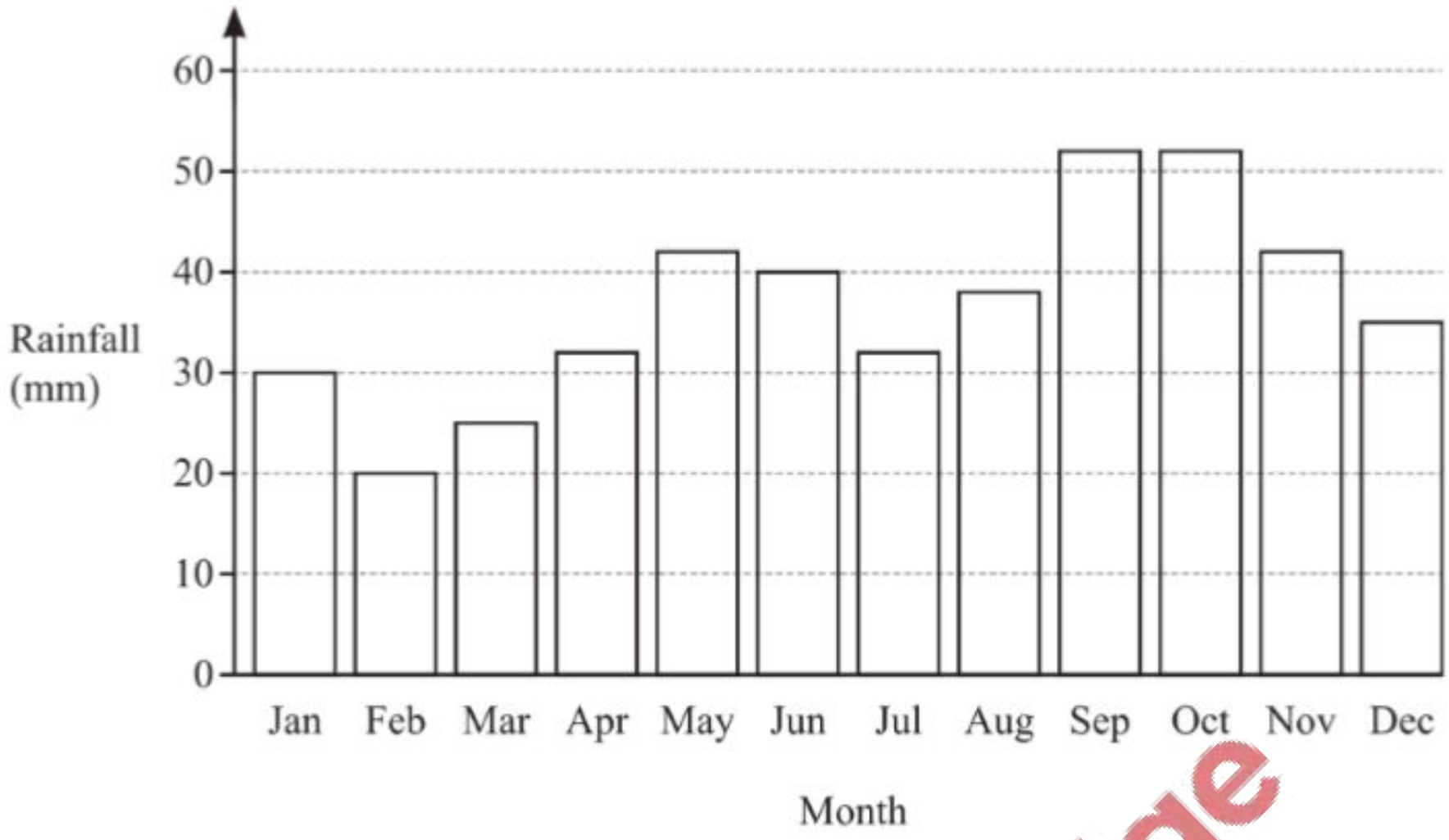
INFORMATION

- 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.

[Turn over

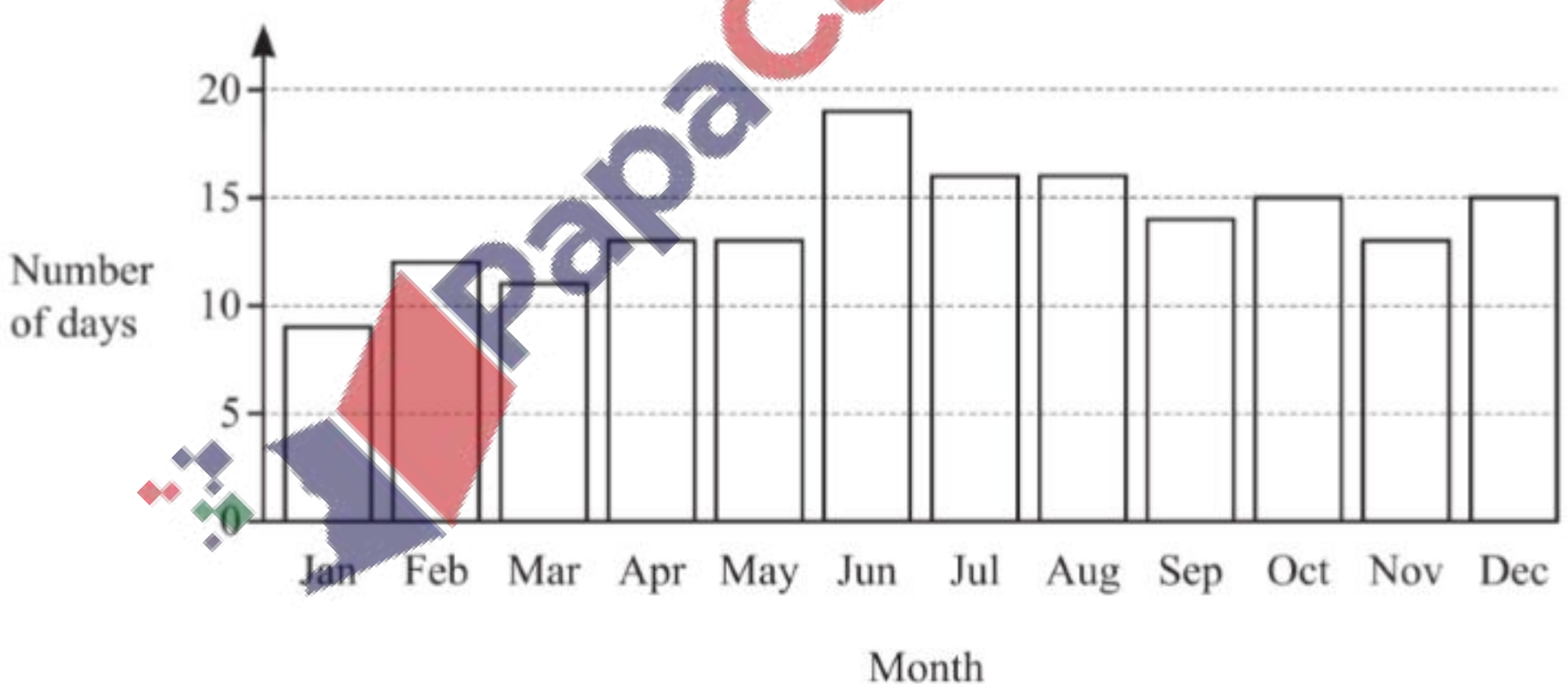
1 This bar chart shows the amount of rainfall, in mm, for each month of one year in a city.



(a) Write down the month with the least amount of rainfall.

Feb [1]

(b) This bar chart shows the number of days it rained each month for the same year in this city.



Mia says that the months with the most rainfall also have the greatest number of days it rained.

Explain why she is wrong.

This is because Sep and Oct have the most rainfall, but June has the most rain days. [1]

2 Complete this bill.

2.5 kg potatoes at \$1.12 per kg		\$ 2.80
1.8 kg bananas at \$1.05 per kg		\$ 1.89
Total	=	\$ 4.69

[3]

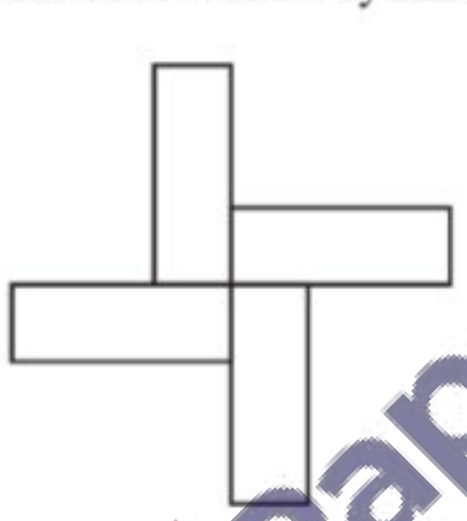
3 **(a)** Write 97.4236 correct to 3 decimal places.

97.424 [1]

(b) Write down the reciprocal of 2.

$\frac{1}{2}$ [1]

4 Write down the order of rotational symmetry of each shape.



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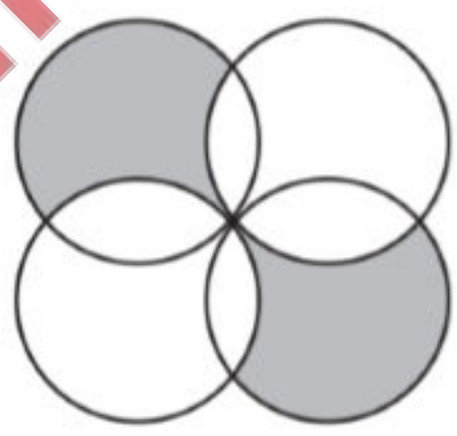


2

[2]

5 The mean of seven numbers is 16.

Six of these numbers are 12, 20, 19, 10, 21 and 13.

Find the seventh number.

$* 16 = \frac{12+20+19+10+21+13+x}{7}$

$\Rightarrow 16 = \frac{95+x}{7}$

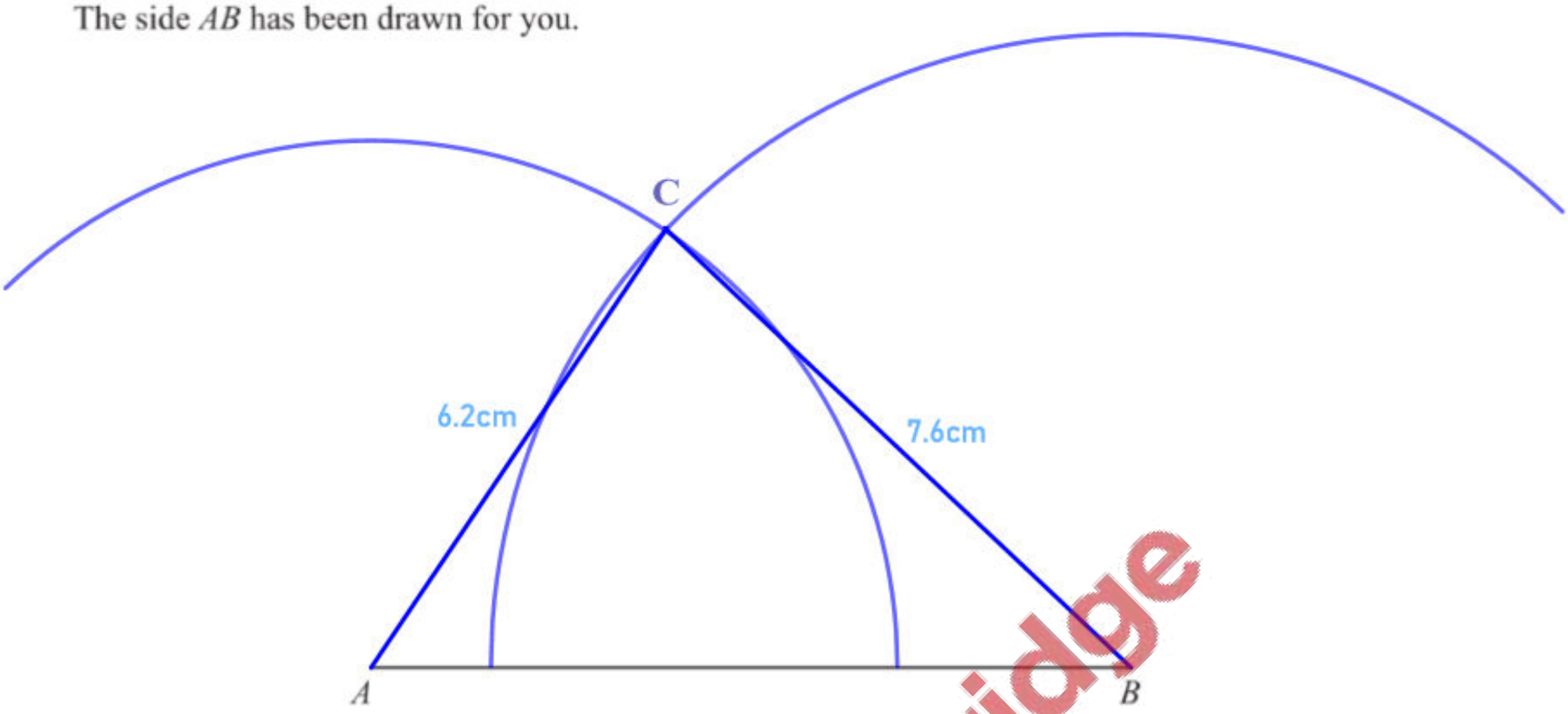
$\Rightarrow 112 = 95 + x$

$\Rightarrow x = 17$

17 [2]

6 In triangle ABC, $BC = 7.6\,\text{cm}$ and $AC = 6.2\,\text{cm}$.

Using a ruler and compasses only, construct triangle ABC.
Leave in your construction arcs.
The side AB has been drawn for you.



[2]

7 **(a)** This table shows the temperature, in °C, at midnight and at 3 pm for four cities on the same day.

City	Temperature at midnight (°C)	Temperature at 3 pm (°C)	
Sydney	21	28	(28-21)°C = 7°C
Oslo	−3	1	(1-(-3))°C = 4°C
Toronto	−18	−8	(-8-(-18))°C = 10°C
Seoul	−5	4	(4-(-5))°C = 9°C

Use the table to complete this statement.

The city with the biggest difference in temperature between midnight and 3 pm

is ..... Toronto ..... with a difference of ..... 10 .....°C. [2]

(b) The temperature at midnight in Moscow was −11 °C.
At 3 pm the temperature has increased by 5 °C.

Work out the temperature at 3 pm.

✱ T(3pm) = -11°C + 5°C = -6°C //

..... -6 .....°C [1]

8 Calculate.

$$\frac{4}{\sqrt{0.0025}}$$

80 [1]

9 Thor changes 40 000 Icelandic Krona into dollars when the exchange rate is 1 krona = \$0.0099 .

Work out how many dollars he receives.

1 kr → \$0.0099

40 000 kr → x

$\Rightarrow x = \frac{40\,000\,\text{kr}}{1\,\text{kr}} \times \$0.0099 = \$396$

\$ 396 [1]

10 Ethan invests \$6400 at a rate of 2.6% per year simple interest.

Calculate the total value of his investment at the end of 3 years.

$* \; T = P + I$

$\Rightarrow T = P + \frac{PRT}{100}$

$\Rightarrow T = \$6400 + \frac{\$6400 \times 2.6 \times 3}{100}$

$\Rightarrow T = \$6899.20$

\$ 6899.20 [3]

11 A straight line, l, has equation $y = 5x + 12$.

(a) Write down the gradient of line l.

5 [1]

(b) Find the coordinates of the point where line l crosses the x-axis.

At the point where the line crosses the x-axis,

y=0

$\Rightarrow 5x + 12 = 0$

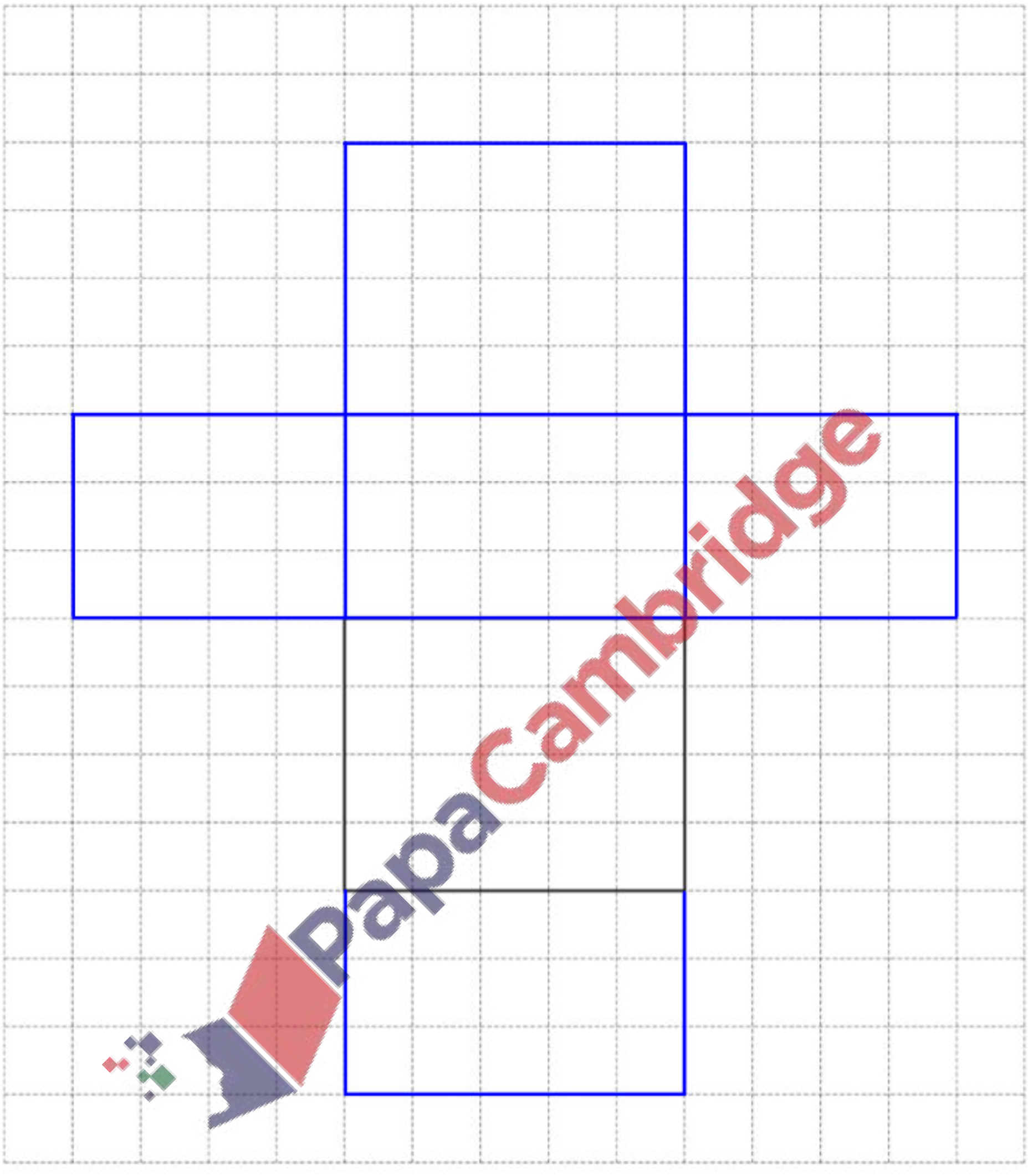
$\Rightarrow 5x = -12$

$\Rightarrow x = -2.4$

(-2.4 , 0) [2]

12 **(a)** A cuboid has length 5 cm, width 4 cm and height 3 cm.

On the 1 cm^2 grid, complete the net of the cuboid.
One face has been drawn for you.



[3]

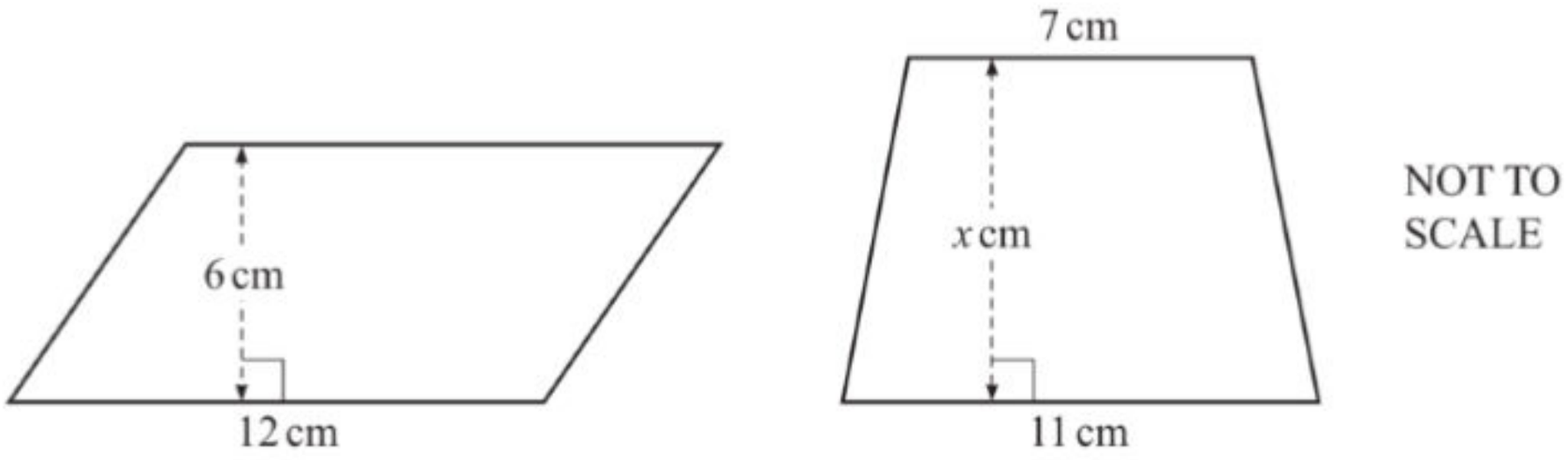
(b) Find the volume of the cuboid.

* $V = l \times w \times h$

$\Rightarrow V = (5 \times 4 \times 3)\,cm^3 = 60\,cm^3$

..... 60 ..... cm^3 [2]

13



NOT TO SCALE

The area of the parallelogram is the same as the area of the trapezium.

Work out the value of x.

* $A_P = A_T$

$\Rightarrow 6 \times 12 = \frac{1}{2}(7+11)x$

$\Rightarrow 72 = 9x$

$\Rightarrow x = 8$

$x =$ ..... 8 ..... [3]

14 The length, l cm, of a line is 18.3 cm, correct to the nearest millimetre. 1mm = 0.1cm

Complete this statement about the value of l.

* $l = 18.3\text{cm} \pm \frac{0.1\text{cm}}{2}$

* $LB(l) = \left(18.3 - \frac{0.1}{2}\right)\text{cm} = 18.25\text{cm}$

..... 18.25 ..... $\leqslant l <$ ..... 18.35 ..... [2]

* $UB(l) = \left(18.3 + \frac{0.1}{2}\right)\text{cm} = 18.35\text{cm}$

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

$$\frac{37.8 \times 13.2}{28.5 + 22.1}.$$

You must show all your working.

$\Rightarrow \frac{40 \times 10}{30+20}$

$\Rightarrow \frac{400}{50}$

$\Rightarrow 8$ //

8 ..... [2]

16 A bag contains 7 red discs, 5 green discs and 2 pink discs. 7+5+2 = 14

Helen takes one disc at random, records the colour and replaces it in the bag.
She does this 140 times.

Find how many times she expects to take a green disc.

* $N = \frac{5}{14} \times 140 = 50$ //

50 ..... [2]

17 Expand the brackets and simplify.

$$4(2m+3) - 5(m-2)$$

$\Rightarrow 8m + 12 - 5m + 10$

$\Rightarrow 3m + 22$ //

3m+22 ..... [2]

18 Ramond walks 2460 metres in 33 minutes.

Work out Ramond's average speed in kilometres per hour.

$* \; v = \frac{d}{t}$

$\Rightarrow v = \dfrac{\frac{2460}{1000}\text{ km}}{\frac{33}{60}\text{ h}}$

$\Rightarrow v = 4.47 \text{ km/h}$ // (3 sig. figs)

4.47 ..... km/h [3]

19 A regular polygon has an exterior angle of 20°.

Work out the number of sides of this polygon.

$*$ Exterior angle $= \frac{360°}{n}$

$\Rightarrow 20° = \frac{360°}{n}$

$\Rightarrow n = \frac{360°}{20°} = 18$ //

18 ..... [1]

20 **Without using a calculator**, work out $1\frac{1}{7} \times 2\frac{1}{10}$.

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

$\Rightarrow \frac{\overset{4}{\cancel{8}}}{\underset{1}{\cancel{7}}} \times \frac{\cancel{21}^{3}}{\underset{5}{10}}$

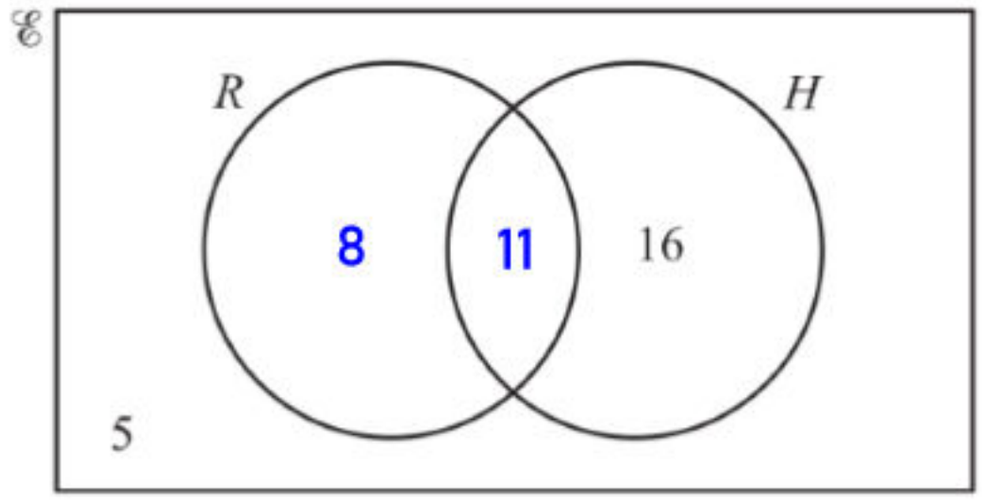
$\Rightarrow \frac{12}{5} = 2\frac{2}{5}$ //

$2\frac{2}{5}$ ..... [3]

21 $\mathscr{E}$ = {children in a group}
R = {children who own a rabbit}
H = {children who own a hamster}

There are 40 children in the group.
19 children own a rabbit.
27 children own a hamster.

(a) Complete the Venn diagram.

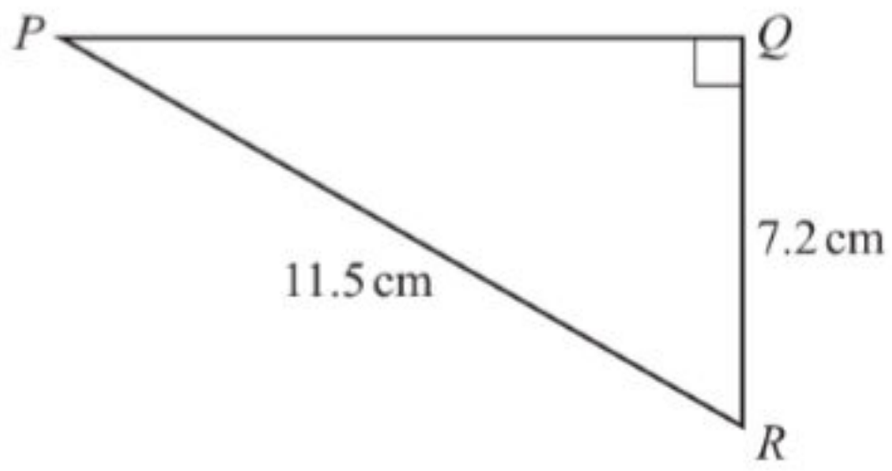


[2]

(b) Write down $n(R \cap H)$.

11 [1]

22



NOT TO SCALE

Calculate PQ.

$*\ 11.5^2 = PQ^2 + 7.2^2$

$\Rightarrow PQ = \sqrt{11.5^2 - 7.2^2}$

$\Rightarrow PQ = 8.97$ // (3 sig. figs.)

$PQ =$ 8.97 cm [3]

23 Solve the simultaneous equations.
You must show all your working.

$3x - 8y = 22$ —(1)
$x + 4y = 4$ —(2)

(2) × 2: $2x + 8y = 8$ —(3)

(1) + (3): $5x = 30$

$\Rightarrow x = 6$ //

Put x in (2)

$*\ 6 + 4y = 4$

$\Rightarrow 4y = -2$

$\Rightarrow y = -0.5$ //

$x =$ 6

$y =$ -0.5 [3]

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