Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

MATHEMATICS

0580/13

Paper 1 (Core)

May/June 2021

1 hour

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

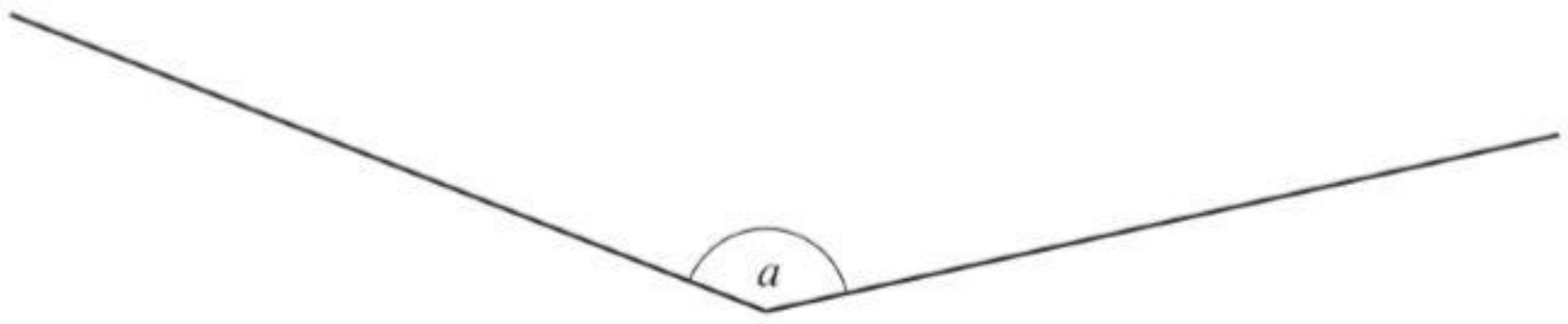
- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction 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.

1



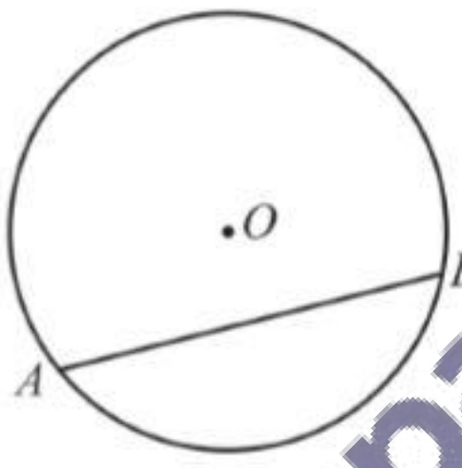
(a) Measure angle a.

146° [1]

(b) Write down the mathematical name for this type of angle.

Obtuse [1]

2



NOT TO SCALE

Points A and B lie on a circle, centre O.

(a) Write down the mathematical name for line AB.

Chord [1]

(b) The circle has a diameter of 16.8 cm.

Write down the radius of the circle.

* radius = $\frac{16.8\,cm}{2}$ = 8.4 cm

8.4 cm [1]

3 Write down the number that is 23 less than -1.6 .

$\star -1.6 - 23 = -24.6$ //

-24.6 ..... [1]

4 Write as a fraction in its simplest form.

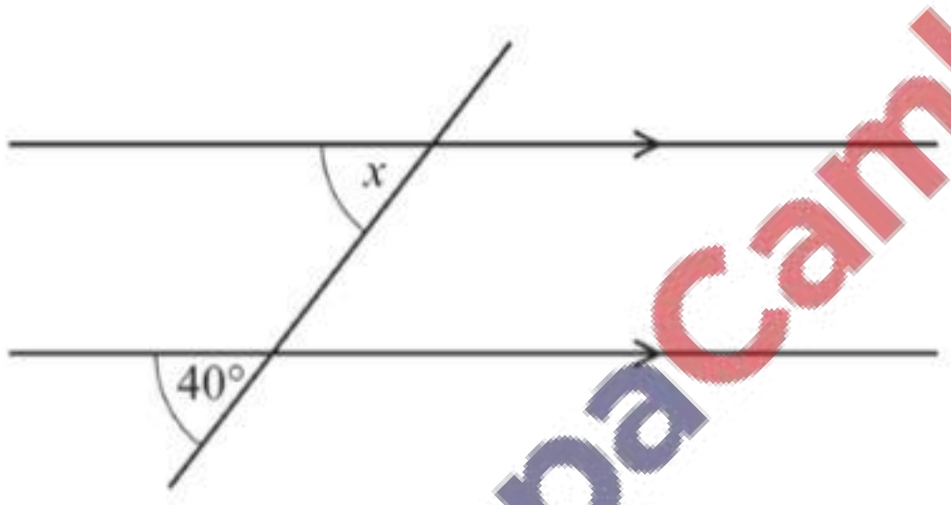
(a) 72%

$\frac{18}{25}$ ..... [1]

(b) 0.004

$\frac{1}{250}$ ..... [1]

5



NOT TO SCALE

The diagram shows a pair of parallel lines and a straight line.

Complete the statement with the correct geometrical reason.

$x = 40°$ because the angles are corresponding ..... [1]

6

18 28 7 15 41 19 31 53

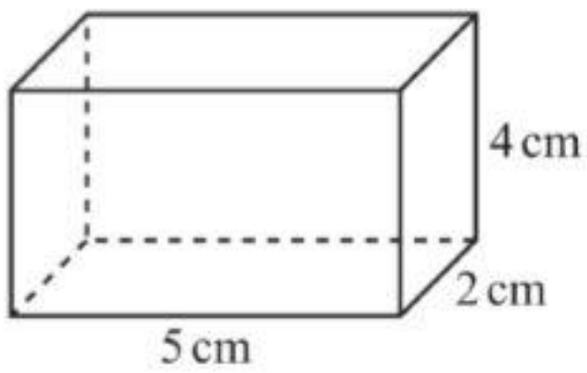
Calculate the mean of these numbers.

$\star$ Mean $= \frac{18+28+7+15+41+19+31+53}{8}$

$\Rightarrow$ Mean $= 26.5$ //

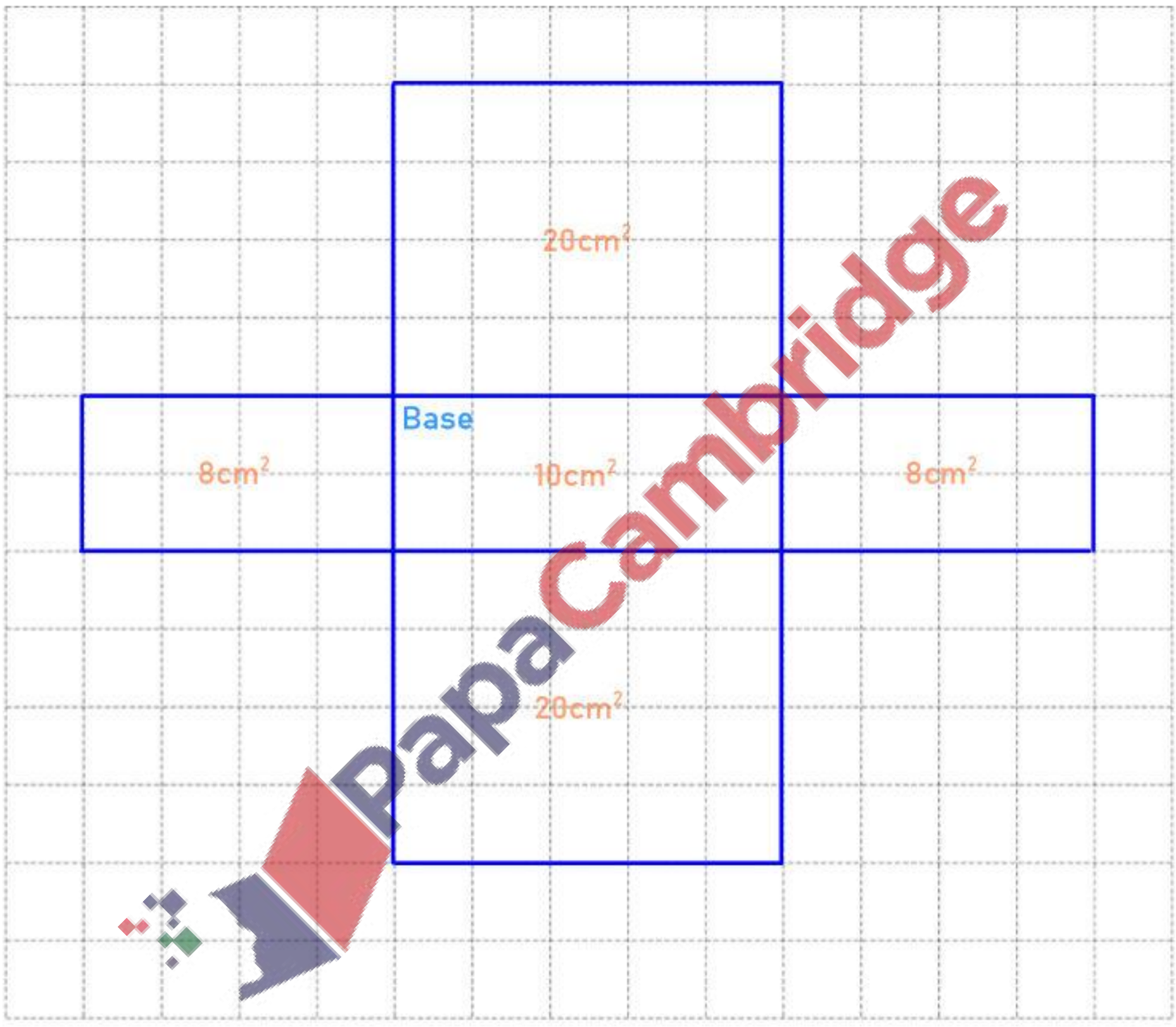
26.5 ..... [2]

7 The diagram shows a box in the shape of a cuboid.
The box has an **open top**.



NOT TO SCALE

(a) On the 1cm^2 grid, draw a net of this box.



[3]

(b) The outside of the box is painted.

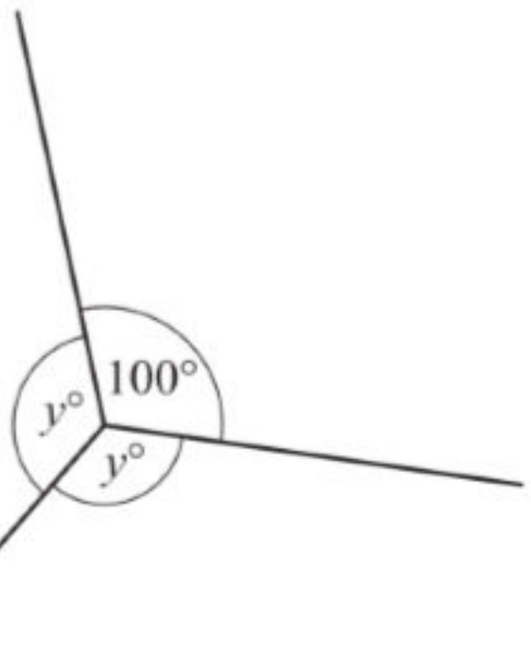
Work out the total area that is painted.

* Total Area = $10\text{cm}^2 + (2 \times 20\text{cm}^2) + (2 \times 8\text{cm}^2)$

$= 66\text{cm}^2$ //

66 ..... cm^2 [2]

8



NOT TO SCALE

Find the value of y.

★ $100° + y + y = 360°$

$\Rightarrow 2y = 260°$

$\Rightarrow y = 130°$

$y =$ 130 [2]

9 12 18 29 49 91 125

From the list of numbers, write down

(a) a cube number,

125 [1]

(b) a prime number.

29 [1]

10 **(a)** $\mathbf{a} = \begin{pmatrix} 3 \\ -4 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 5 \\ 2 \end{pmatrix}$

Work out.

(i) $8\mathbf{b} = \begin{pmatrix} 8\times5 \\ 8\times2 \end{pmatrix}$

$= \begin{pmatrix} 40 \\ 16 \end{pmatrix}$ //

$\begin{pmatrix} 40 \\ 16 \end{pmatrix}$ [1]

(ii) $\mathbf{a} - \mathbf{b} = \begin{pmatrix} 3-5 \\ -4-2 \end{pmatrix}$

$= \begin{pmatrix} -2 \\ -6 \end{pmatrix}$ //

$\begin{pmatrix} -2 \\ -6 \end{pmatrix}$ [1]

(b) Point L has coordinates $(-3,6)$ and $\overrightarrow{LM} = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$.

Find the coordinates of point M.

M(-3+5, 6+(-2))

M(2, 4) //

(2 , 4) [1]

11 Maria buys n pencils that cost p cents each.
She pays with a \$$y$ note.

Find, in terms of n, p and y, the amount of change Maria receives.
Give your answer in cents.

* \$ 1 = 100 cents

100y − np cents [2]

12 Francesca spins a four-sided spinner numbered 1, 2, 3 and 4.
The table shows some of the probabilities of landing on each number.

Number	1	2	3	4
Probability	0.18	0.21	0.37	0.24

Complete the table.

$\star\ 0.18 + 0.21 + 0.37 + x = 1$

$\Rightarrow x = 0.24$ //

[2]

13 Alex changes 190 euros (€) into pounds (£) when £1 = €1.1723 .

Calculate the amount Alex receives.
Give your answer correct to 2 decimal places.

£1 = €1.1723
x = €190

$\Rightarrow x = \frac{€190}{€1.1723} \times £1$

$\Rightarrow x = £162.07\ (2\ dp)$ //

£ 162.07 [2]

14 The exterior angle of a regular polygon is 36°.

Find how many sides this polygon has.

$\star$ Exterior angle $= \frac{360°}{n}$

$\Rightarrow 36° = \frac{360°}{n}$

$\Rightarrow n = \frac{360°}{36°} = 10$ //

10 [1]

15 Expand and simplify.

$6(t-q)-2(t-3q)$

$\Rightarrow 6t - 6q - 2t + 6q$

$\Rightarrow 4t$ //

4t [2]

16 **Without using a calculator**, work out $1\frac{2}{3} \div 7\frac{1}{2}$.

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

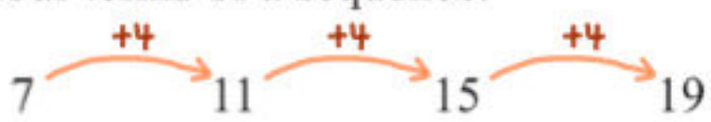
$\Rightarrow \frac{5}{3} \div \frac{15}{2}$

$\Rightarrow \frac{5^{1}}{3} \times \frac{2}{\cancel{15}_{3}}$

$\Rightarrow \frac{2}{9}$ //

$\frac{2}{9}$ ..... [3]

17 These are the first four terms of a sequence.



Find the nth term.

$\star\ a_n = a_1 + (n-1)d$

$\Rightarrow a_n = 7 + (n-1) \times 4$

$\Rightarrow a_n = 7 + 4n - 4$

$\Rightarrow a_n = 4n + 3$ //

$4n + 3$ ..... [2]

18 **(a)** Calculate the volume of a cylindrical vase with radius 14.2 cm and height 18 cm.

$\star\ V = \pi r^2 h$

$\Rightarrow V = \pi (14.2\text{ cm})^2 \times 18\text{ cm}$

$\Rightarrow V = 11400\text{ cm}^3$ (3 sig. figs.) //

11400 ..... cm^3 [2]

(b) Change your answer to **part (a)** into litres.

$1\text{L} \rightarrow 1000\text{ cm}^3$
$x \rightarrow 11400\text{ cm}^3$
$\Rightarrow x = \frac{11400\text{ cm}^3}{1000\text{ cm}^3} \times 1\text{L} = 11.4\text{L}$ //

11.4 ..... litres [1]

19 **(a)** Write 0.000 74 in standard form.

7.4×10^{-4} //

7.4×10^{-4} ..... [1]

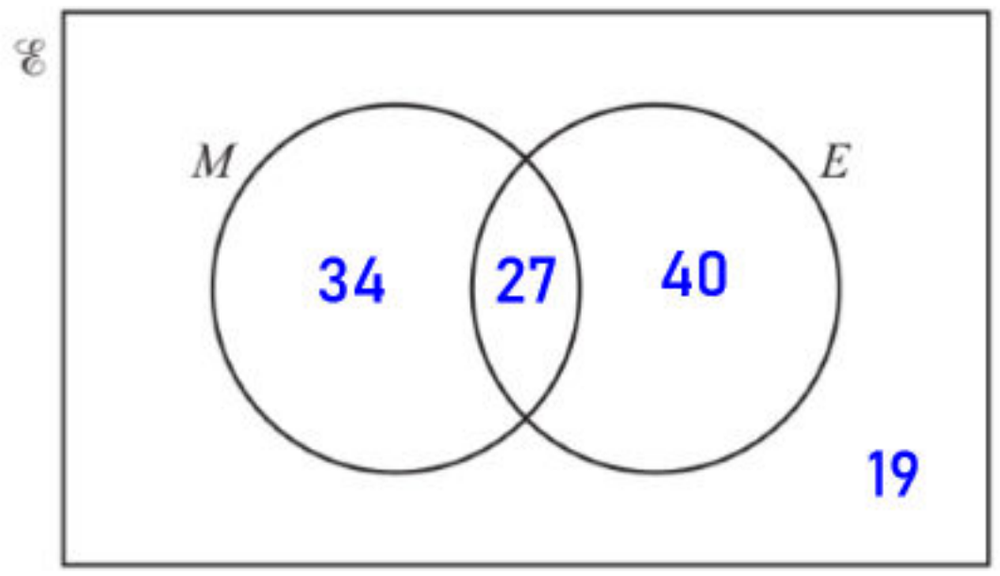
(b) Calculate $4.6 \times 10^2 \times 6.7 \times 10^5$. $= 308\ 200\ 000 \approx 310\ 000\ 000$ (2 sig. figs.)
Give your answer in standard form, correct to 2 significant figures.

3.1×10^8 //

3.1×10^8 ..... [2]

20 **(a)** A group of 120 students take two tests, mathematics and English.
Here is some information about the number of students who pass mathematics (M) and who pass English (E).

- 61 students pass mathematics.
- 27 students pass both mathematics and English.
- 19 students do not pass mathematics and do not pass English.

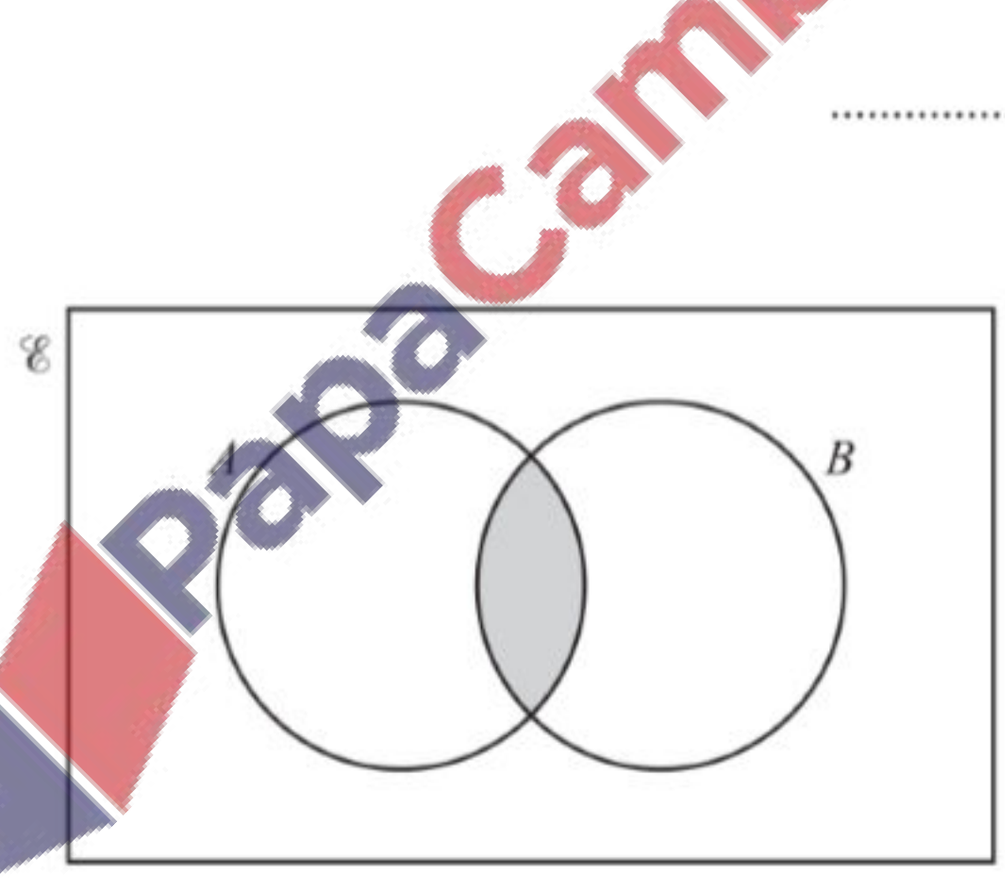


(i) Complete the Venn diagram. [3]

(ii) Use the Venn diagram to find n(E).

67 [1]

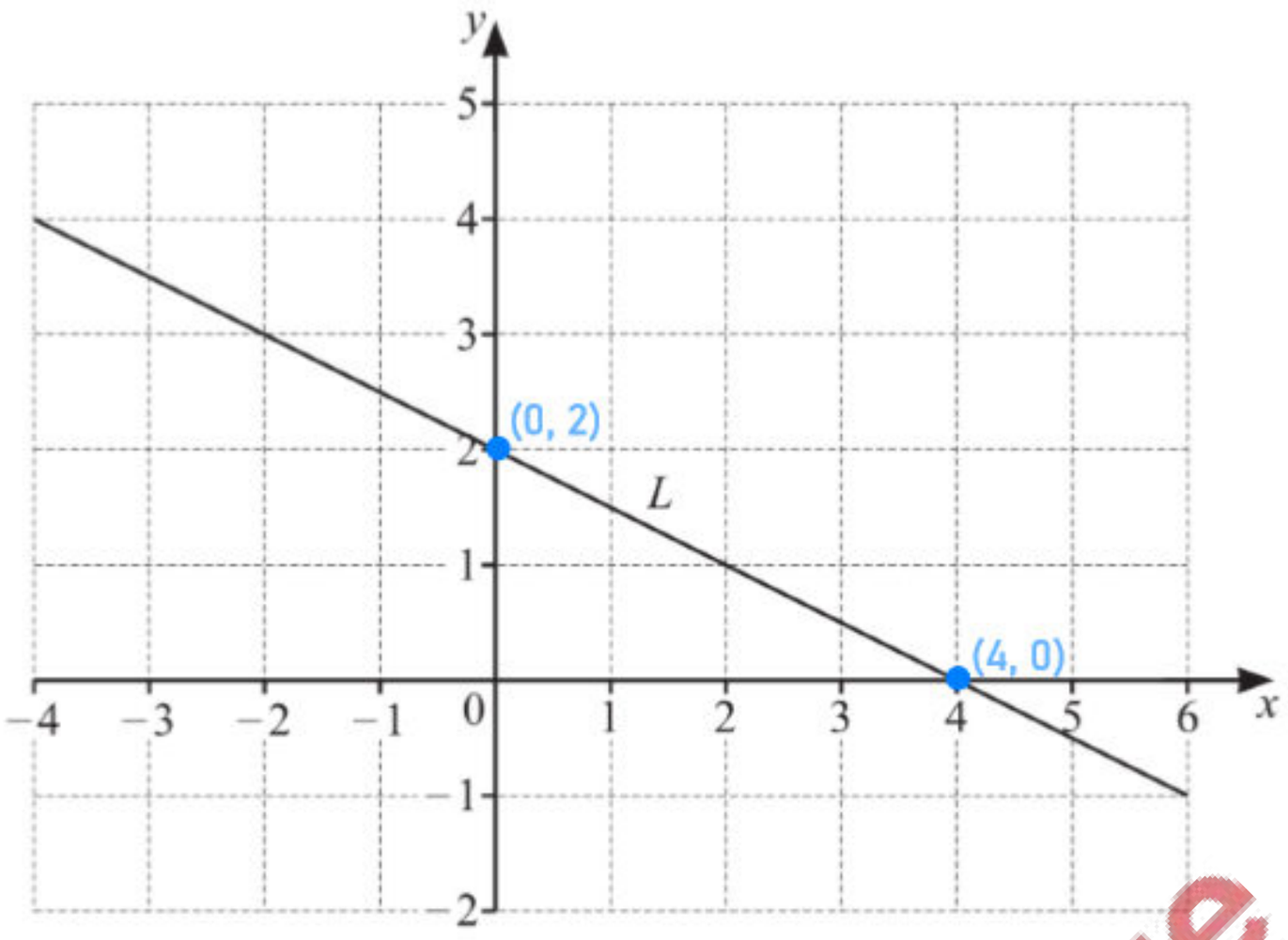
(b)



Use set notation to describe the shaded region.

$A \cap B$ [1]

21 (a)



Find the equation of line L in the form $y = mx + c$.

* $y = mx + c$

• $m = \frac{2-0}{0-4} = -\frac{1}{2}$

• $c = 2$

$y =$ $-\frac{1}{2}x + 2$ [2]

(b) Find the equation of the line which is

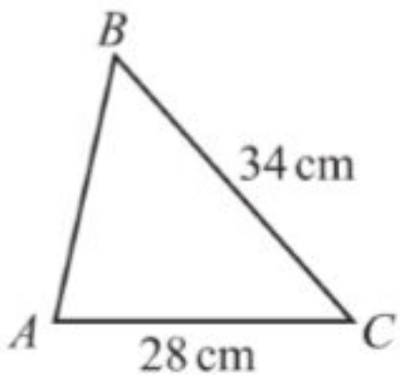
• parallel to the line $y = 3x - 5$

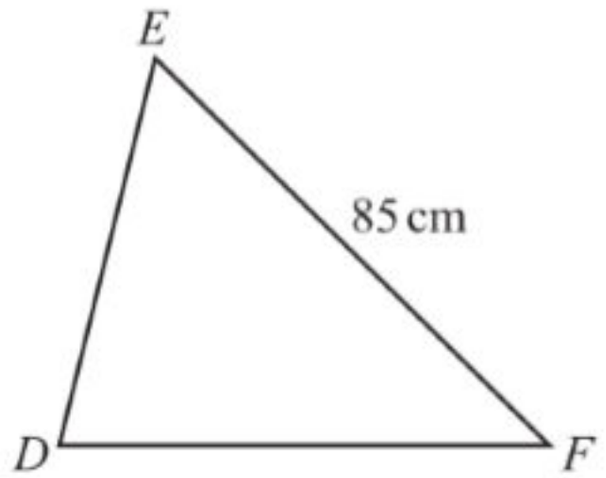
and

• passes through the point (0, 17).

$y = 3x + 17$ [1]

22





NOT TO SCALE

Triangle ABC is similar to triangle DEF.

Calculate DF.

$\star \frac{DF}{28cm} = \frac{85cm}{34cm}$

$\Rightarrow DF = \left(\frac{85}{34} \times 28\right) cm$

$\Rightarrow DF = 70cm$

$DF =$ 70 cm [2]

23 Simplify $3x^3 \times 4x^4$.

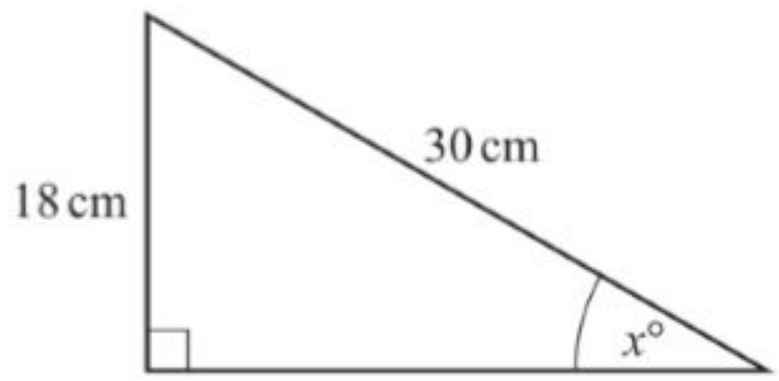
$\Rightarrow (3\times4)x^{3+4}$

$\Rightarrow 12x^7$

$12x^7$ [2]

Question 24 is printed on the next page.

24



NOT TO SCALE

The diagram shows a right-angled triangle.

Show that the value of x is 36.9, correct to 1 decimal place.

$\star \sin x = \frac{18\text{cm}}{30\text{cm}}$

$\Rightarrow x = \sin^{-1}\left(\frac{18}{30}\right)$

$\Rightarrow x = 36.869° \ldots \approx 36.9° (1\text{ dp})$ //

[2]