



# Cambridge IGCSE™

CANDIDATE NAME



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## MATHEMATICS

0580/31

Paper 3 Calculator (Core)

October/November 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  $\pi$ , 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 **16** pages.

**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  $h$ .

$$V = \frac{1}{3}\pi r^2 h$$

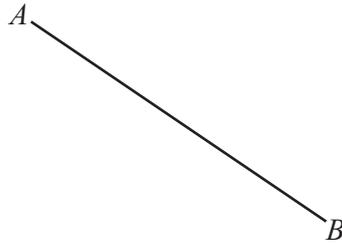
Volume,  $V$ , of sphere of radius  $r$ .

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





1



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

..... cm [1]

(b) Draw a line that is perpendicular to the line *AB*.

[1]

2 Complete this shopping bill.

3.4 kg of flour at \$4.60 per kg	= \$ .....
2.75 kg of sugar at \$ ..... per kg	= \$ 9.90
Total = \$ .....	

[3]

3 Total cost of a journey = number of litres of fuel used × cost of fuel per litre.

A journey uses 128 litres of fuel.  
The cost of fuel is \$1.52 per litre.

Calculate the total cost of this journey.

\$ ..... [1]



DO NOT WRITE IN THIS MARGIN



4

4

$\frac{6}{15}$

$\frac{1}{10}$

$\frac{16}{80}$

$\frac{10}{25}$

$\frac{5}{2}$

Draw a ring around the fractions which are **not** equivalent to  $\frac{2}{5}$ . [2]

5 Find the value of

(a) (i)  $\sqrt{1.96}$

..... [1]

(ii)  $17^3$

..... [1]

(iii)  $-0.8 \times -1.2$

..... [1]

(b) Write these numbers in order, starting with the smallest.

$\frac{11}{19}$

58%

$\frac{27}{47}$

0.574

..... < ..... < ..... < ..... [2]  
*smallest*

6

17	4	25	18	14	6	3	18	12
----	---	----	----	----	---	---	----	----

Find

(a) the mode

..... [1]

(b) the range.

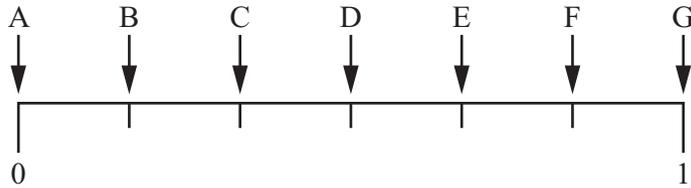
..... [1]





- 7 A bag contains 6 red balls, 4 green balls and 2 blue balls. Zia takes a ball from the bag at random.

The diagram shows a probability scale.

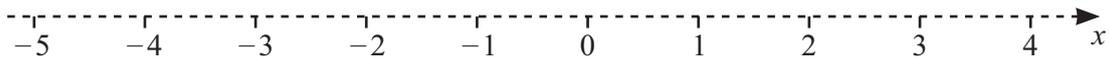


Which arrow shows the probability that,

- (a) Zia takes a green ball ..... [1]
- (b) Zia takes a yellow ball ..... [1]
- (c) Zia does **not** take a blue ball. .... [1]

- 8 Solve.

- (a)  $8x = 32$   
 $x =$  ..... [1]
- (b)  $6x - 3 = 12$   
 $x =$  ..... [2]
- (c) Represent the inequality  $-4 \leq x < 2$  on the number line.



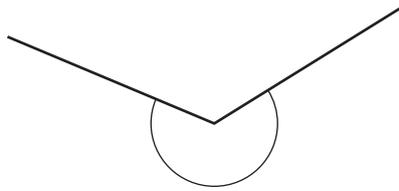
[2]



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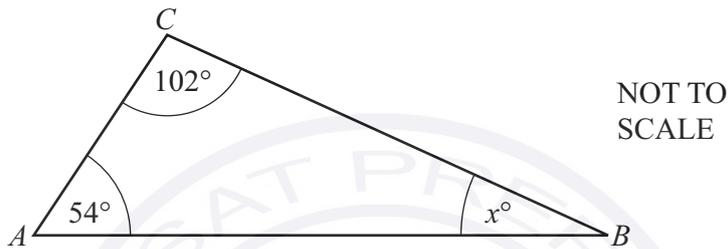
9 (a)



Write down the mathematical name for this type of angle.

..... [1]

(b)  $ABC$  is a triangle.

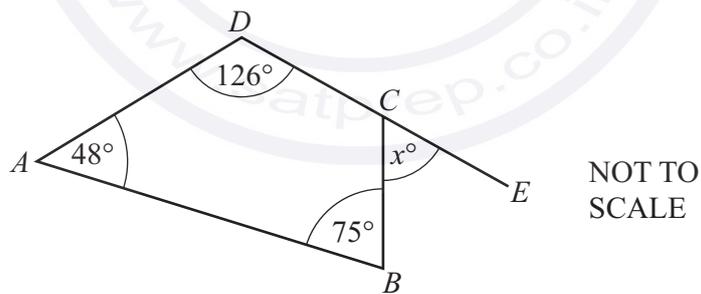


Lily says  $x$  is 34.

Give a geometrical reason why Lily is not correct.

.....  
..... [1]

(c)



$ABCD$  is a quadrilateral.  
 $DCE$  is a straight line.

Calculate the value of  $x$ .

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





DO NOT WRITE IN THIS MARGIN

- 10 Anna and Bruno share some money in the ratio Anna : Bruno = 3 : 7.  
Bruno receives \$36 more than Anna.

Calculate the total amount of money they share.

\$ ..... [2]

- 11 (a) Naz pays \$76.25 per day to hire a car.  
He hires this car for 7 days.  
He also pays \$146 for fuel.

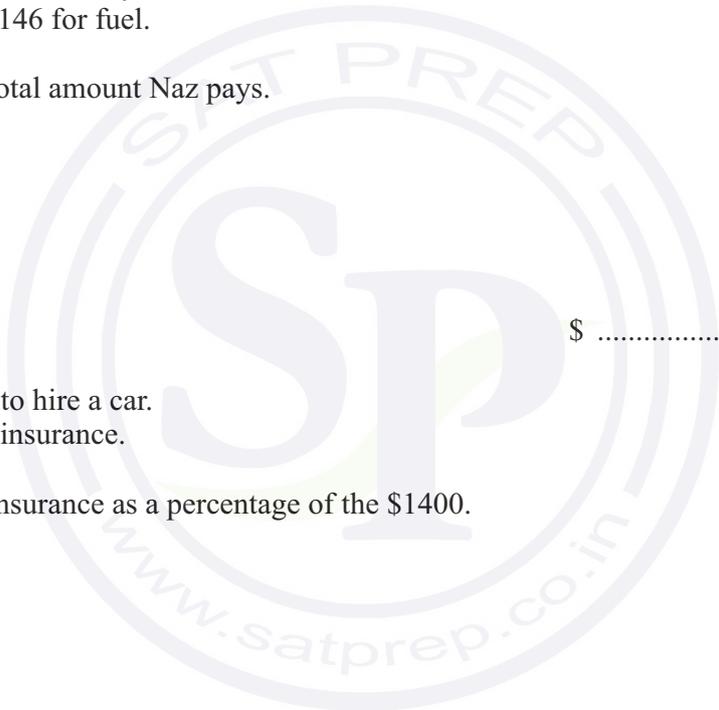
Calculate the total amount Naz pays.

\$ ..... [2]

- (b) Li pays \$1400 to hire a car.  
\$364 of this is insurance.

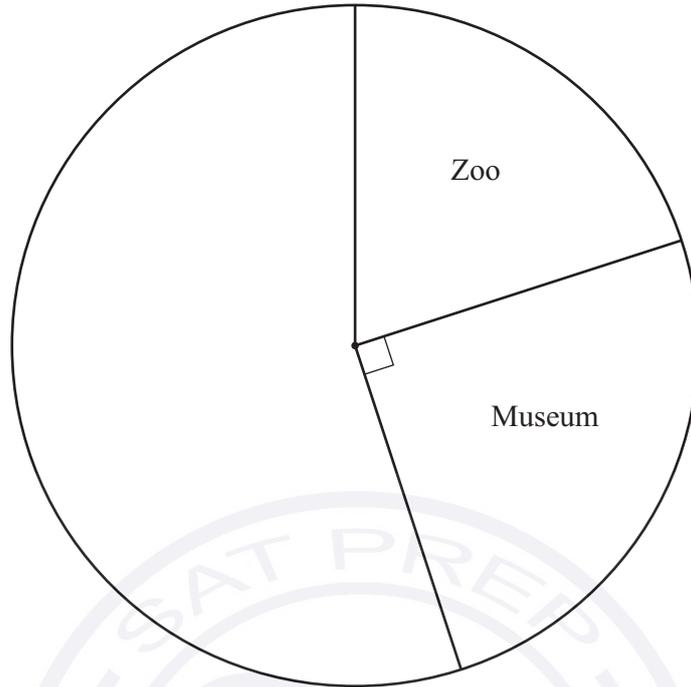
Calculate the insurance as a percentage of the \$1400.

..... % [1]





- 12 300 students choose where to go on a trip.  
The students choose either a zoo, a museum, an art gallery or a sports stadium.



- (a) Show that 75 students choose the museum. [1]
- (b) 45 students choose the art gallery and 120 students choose the sports stadium.  
Complete the pie chart to show this information. [2]

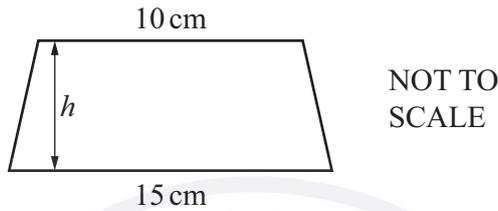


13 (a) The surface area of a solid cube is  $121.5 \text{ cm}^2$ .

Calculate the length of the side of the cube.

..... cm [3]

(b)



The area of the trapezium is  $106.25 \text{ cm}^2$ .

(i) Calculate the height of the trapezium.

..... cm [2]

(ii) Convert  $106.25 \text{ cm}^2$  into  $\text{m}^2$ .

.....  $\text{m}^2$  [1]

14 A bag contains red, yellow, blue and green cards.

The table shows the probability of taking a red card and a yellow card.

The probability of taking a blue card or a green card is in the ratio blue : green = 5 : 2 .

Complete the table.

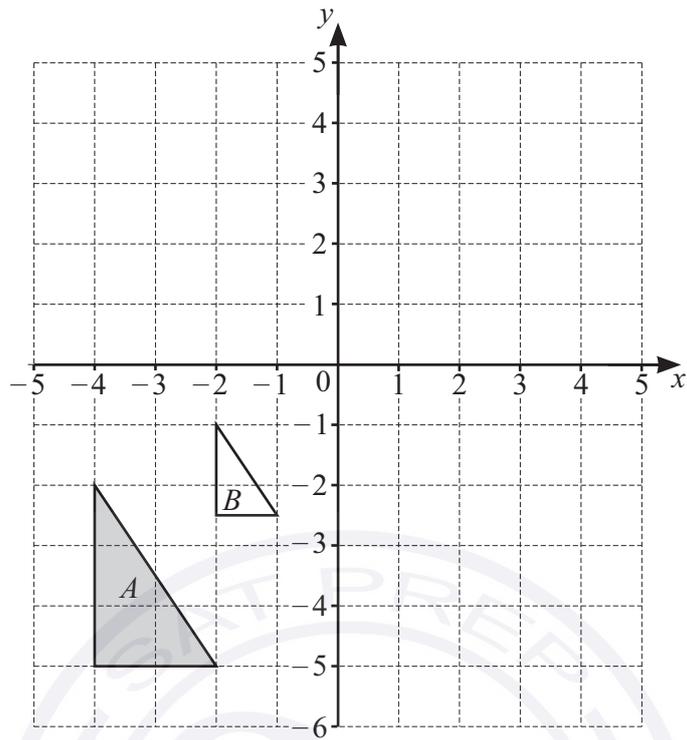
Colour	red	yellow	blue	green
Probability	0.53	0.19		

[3]



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15 Shapes *A* and *B* are shown on the grid.



(a) Describe fully the **single** transformation that maps shape *A* onto shape *B*.

.....

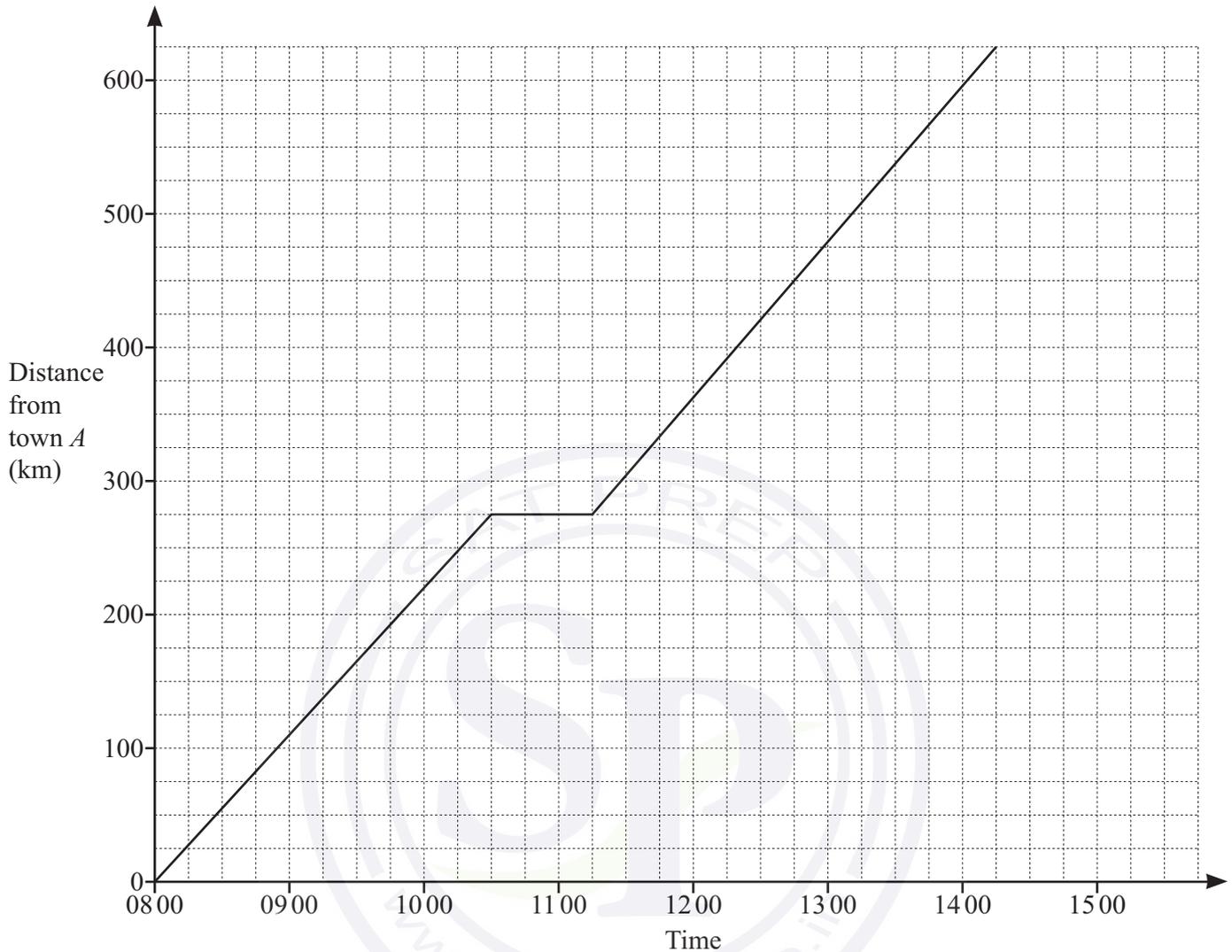
..... [3]

(b) On the grid, draw the image of shape *A* after a translation by the vector  $\begin{pmatrix} 6 \\ 7 \end{pmatrix}$ . [2]





16 Bob travels from town A to town B. The travel graph shows his journey.



(a) Between which two times did Bob stop for a rest? Explain how you know.

..... and ..... because ..... [2]

(b) Calculate Bob's average speed, in km/h, for the whole journey.

..... km/h [3]



DO NOT WRITE IN THIS MARGIN



17 Factorise.

$$21x - 7xy$$

..... [2]

18 (a) The  $n$ th term of a sequence is  $n^2 - 4$ .

Find the first 3 terms of this sequence.

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

(b) These are the first four terms of a different sequence.

5      2      -1      -4

Find the  $n$ th term.

..... [2]

19 Jo invests \$500 at a rate of 2% per year compound interest.

Calculate the amount of interest earned at the end of 7 years.

\$ ..... [3]

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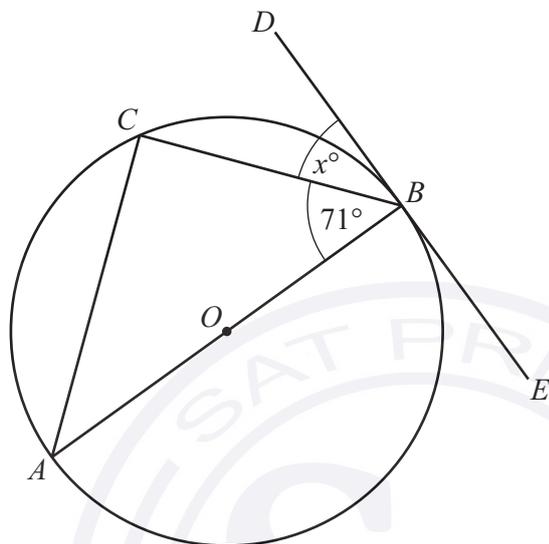
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20 (a) Work out the size of one interior angle of a regular 8-sided polygon.

..... [2]

(b)



NOT TO SCALE

$A, B$  and  $C$  lie on the circumference of the circle, centre  $O$ .  
 $AB$  is a diameter.  
 $DBE$  is a tangent to the circle at  $B$ .

Find the value of  $x$ .  
 Give a geometrical reason for your answer.

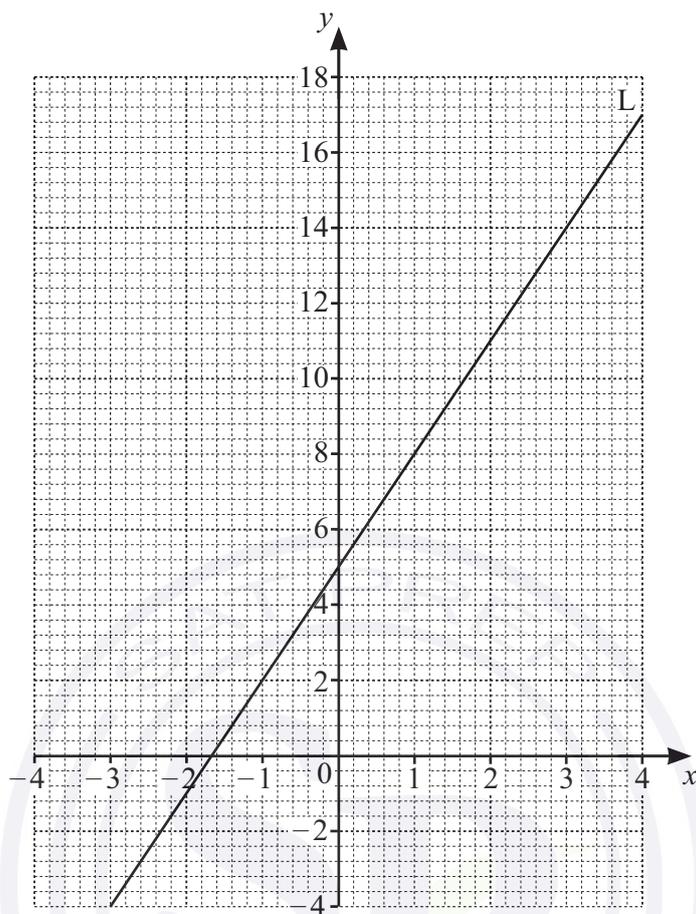
..... because .....

..... [2]





21 The line  $L$  is shown on the grid.



Find the equation of the line  $L$ .

Give your answer in the form  $y = mx + c$ .

$y = \dots\dots\dots$  [3]

DO NOT WRITE IN THIS MARGIN





- 22 (a) A train to town  $P$  leaves a station every 20 minutes.  
 A train to town  $Q$  leaves the same station every 35 minutes.  
 Both trains leave at 09 30.

Find the next time both trains leave together.

..... [3]

- (b) The distance,  $d$  km, between town  $P$  and town  $Q$  is 97 km, correct to the nearest kilometre.

Complete the statement about the value of  $d$ .

.....  $\leq d <$  ..... [2]

23 Calculate  $\frac{4.6 \times 10^3}{1.84 \times 10^5}$ .

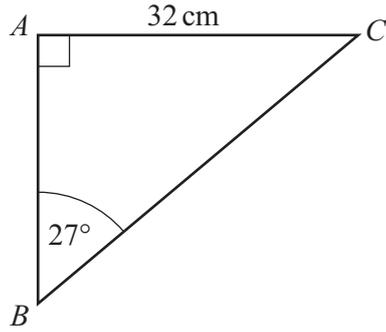
Give your answer in standard form.

..... [2]

Question 24 is printed on the next page



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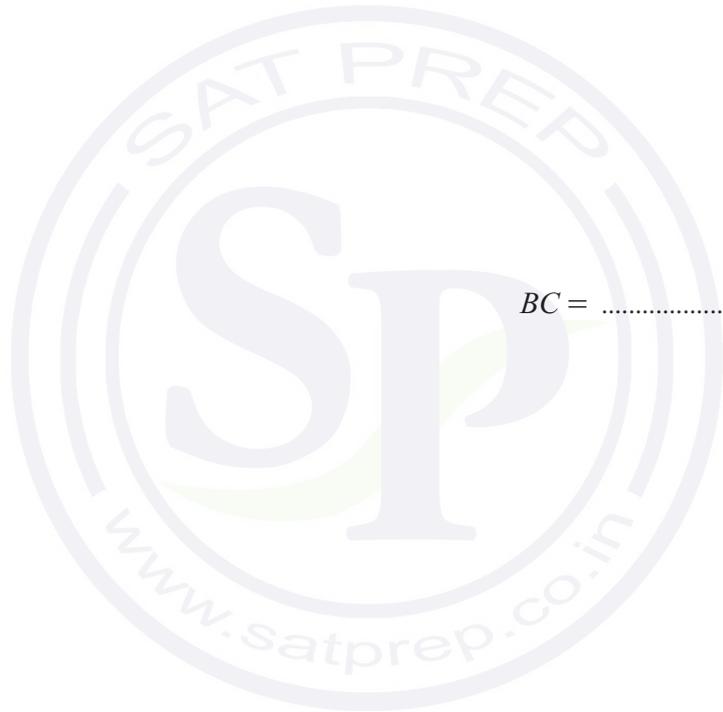


NOT TO SCALE

$ABC$  is a right-angled triangle.

Calculate  $BC$ .

$BC = \dots\dots\dots$  cm [3]



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# Cambridge IGCSE™

CANDIDATE NAME

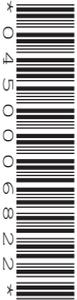


CENTRE NUMBER

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## MATHEMATICS

0580/32

Paper 3 Calculator (Core)

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1 hour 30 minutes

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**List of formulas**

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Volume,  $V$ , of cylinder of radius  $r$ , height  $h$ .  $V = \pi r^2 h$

Volume,  $V$ , of cone of radius  $r$ , height  $h$ .  $V = \frac{1}{3}\pi r^2 h$

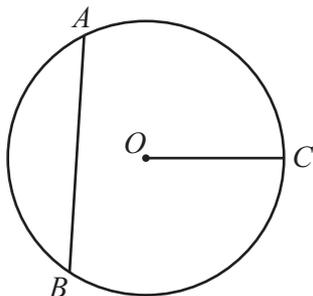
Volume,  $V$ , of sphere of radius  $r$ .  $V = \frac{4}{3}\pi r^3$



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1 *A, B* and *C* are points on a circle, centre *O*.



(a) Write down the mathematical name for line *OC*.

..... [1]

(b) Write down the mathematical name for line *AB*.

..... [1]

2 Write down all the factors of 32.

..... [2]

3 Write one of the symbols  $<$ ,  $>$  or  $=$  in each statement to make it correct.

$\frac{2}{3}$  ..... 0.667

$\frac{1}{8}$  ..... 12.5%

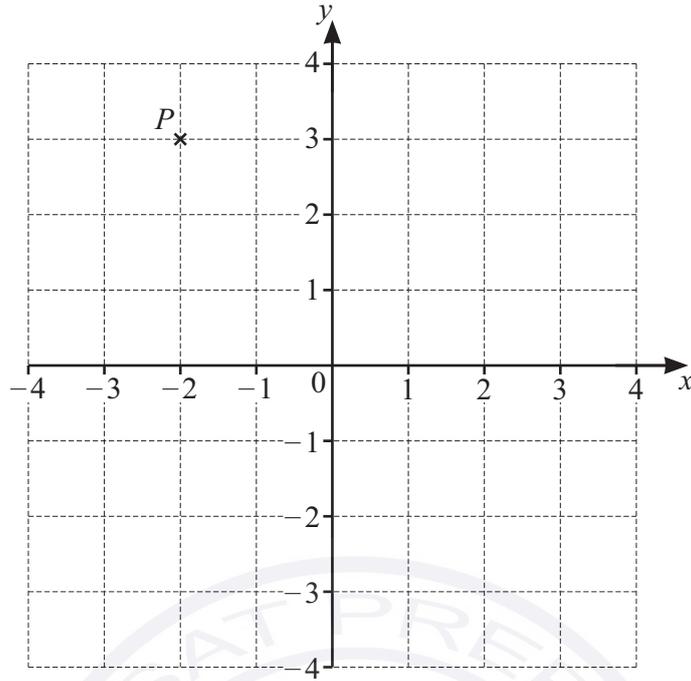
$\frac{7}{8}$  .....  $\frac{71}{80}$

[2]





4



(a) Write down the coordinates of point *P*.

( ..... , ..... ) [1]

(b) On the grid, draw the line  $y = x$ .

[1]

(c) On the grid, draw the line that goes through point *P* and is perpendicular to the line  $y = x$ .

[1]

5 Solve.

(a)  $8x = 5$

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

(b)  $x + 8 = 5$

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





6

- |   |   |   |    |    |    |    |    |
|---|---|---|----|----|----|----|----|
| 0 | 1 | 8 | 27 | 39 | 51 | 59 | 81 |
|---|---|---|----|----|----|----|----|

From the list of numbers, write down

(a) a square number

..... [1]

(b) the value of  $39^0$

..... [1]

(c) a prime number.

..... [1]

7 Calculate  $\sqrt{361} + 1$ .

..... [1]

8 Complete these statements.

65 000 centimetres = ..... metres

3.25 litres = ..... millilitres [2]

9 (a) Shape *A* is a quadrilateral with only one pair of parallel lines.

Write down the mathematical name of shape *A*.

..... [1]

(b) Shape *B* is a quadrilateral with

- two pairs of parallel lines
- all four sides equal
- no right angles.

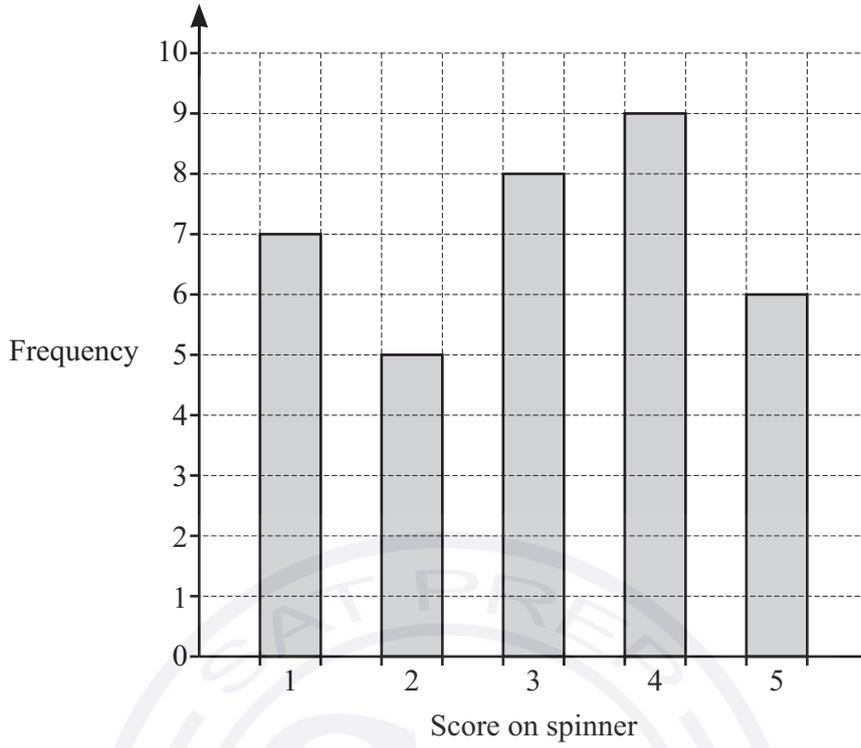
Write down the mathematical name of shape *B*.

..... [1]



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10 The bar chart shows the frequency of each score on a spinner.



Calculate the mean score.

..... [3]

11  $Y = 3t^2 + 2m$

Find the value of  $Y$  when  $t = 6$  and  $m = -3$ .

$Y =$  ..... [2]





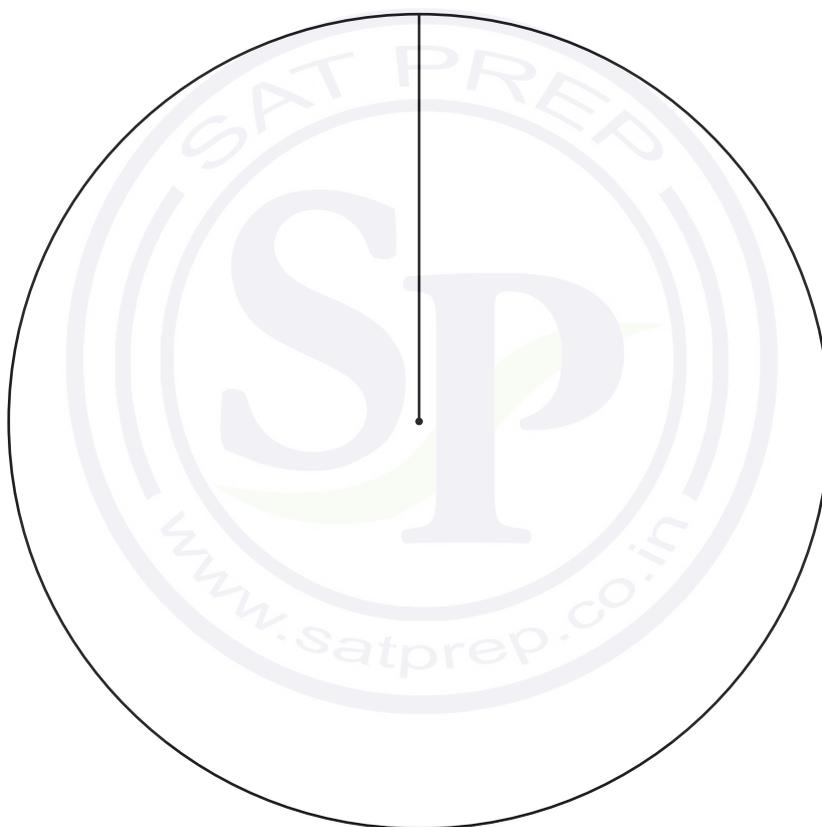
12 The table shows the results of a survey about the colour of 90 cars in a car park.

Colour of car	Frequency	Pie chart sector angle
Black	16	
White	34	
Other	40	

(a) Complete the table.

[2]

(b) Complete the pie chart.



[2]





13 Find the value of  $8^5$ .

Give your answer correct to 3 significant figures.

..... [2]

14 (a) Ada works from Monday to Friday.  
Her working hours each day are 0800 to 1230 and 1330 to 1700.

Find the number of hours she works in 5 days.

..... hours [2]

(b) Ada is paid \$15.20 per hour.  
Work out her pay for these 5 days.

\$ ..... [1]

(c) On Saturday she is paid  $1\frac{1}{2}$  times her normal hourly rate.  
Work out her hourly rate of pay for Saturday.

\$ ..... [1]

(d) Ada changes 370 euros into dollars.  
The exchange rate is \$1 = 0.925 euros.

Work out the amount she receives.

\$ ..... [1]





- 15 The scale drawing shows the position of ship *A*.  
The scale is 1 centimetre represents 40 kilometres.



Scale : 1 cm to 40 km

Ship *B* is 220 km from ship *A* on a bearing of 140°.

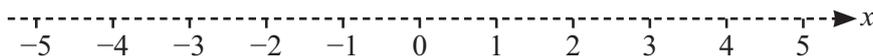
On the scale drawing, mark the position of ship *B*.

[2]

- 16 Find 57% of \$128.

\$ ..... [1]

- 17 Represent the inequality  $x \geq 3$  on the number line.

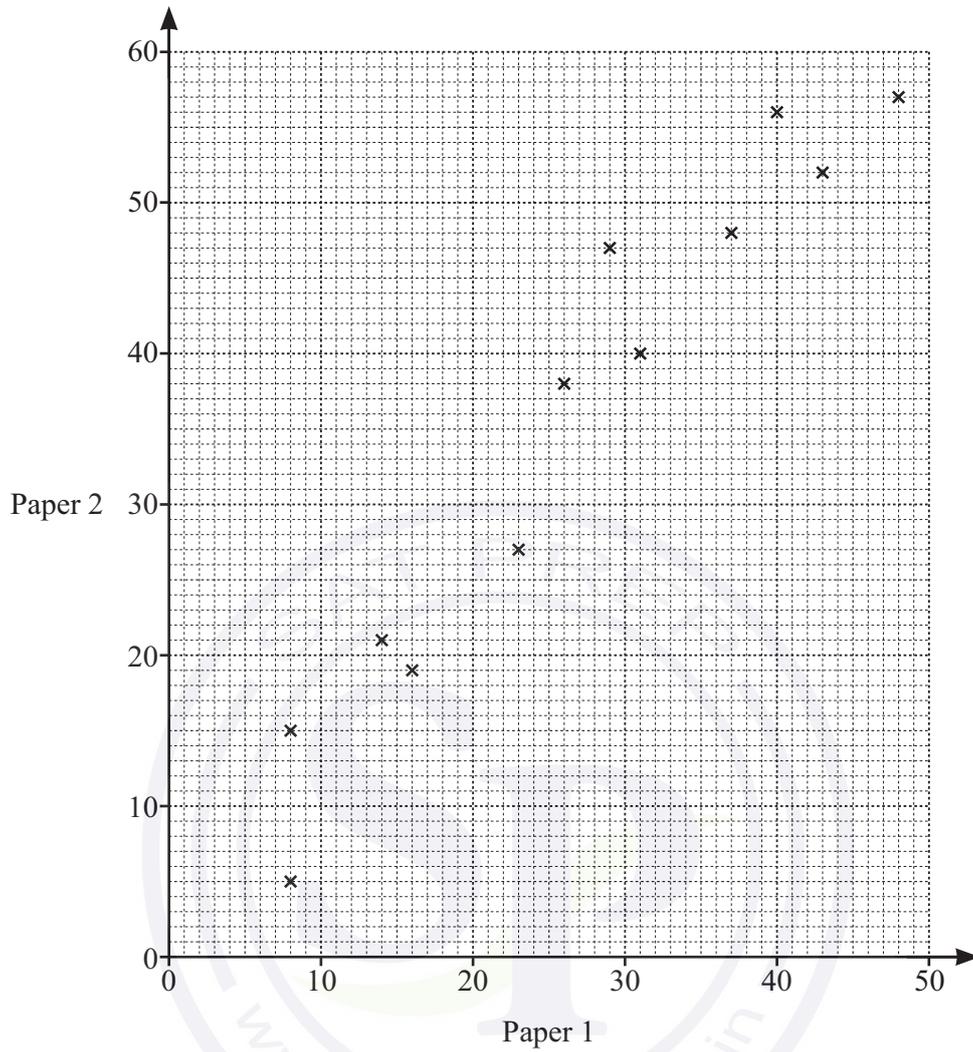


[1]



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- 18 A school records the marks students score in Paper 1 and Paper 2 of a subject. The scatter diagram shows the scores for twelve students.



- (a) What type of correlation is shown in the scatter diagram?

..... [1]

- (b) On the scatter diagram, draw a line of best fit.

[1]

- (c) Another student scores 35 on Paper 1.

Use your line of best fit to find an estimate for their score on Paper 2.

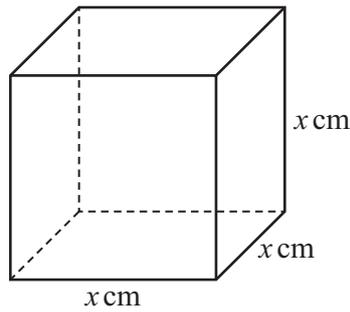
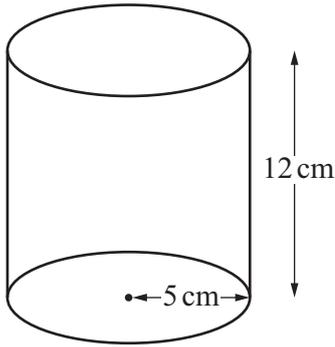
..... [1]





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19 The diagram shows a cylinder and a cube.



NOT TO SCALE

The cylinder has the same volume as the cube.

Find the value of  $x$ .

$x = \dots\dots\dots$  [3]

20 A town has two cinemas, Movie Scene and Flix. The table shows the mean and range of the audience numbers.

	Mean	Range
Movie Scene	83	52
Flix	105	25

(a) Which cinema has higher audience numbers on average? Give a reason for your choice.

Cinema ..... because ..... [1]

(b) Which cinema has greater variation in its audience numbers? Give a reason for your choice.

Cinema ..... because ..... [1]



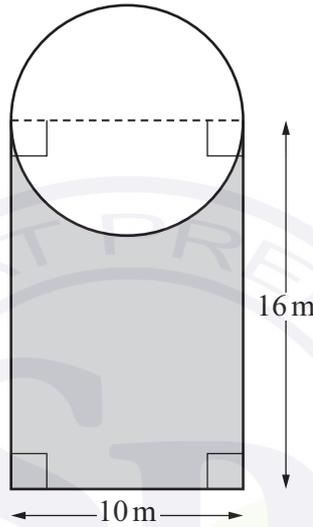


21 Calculate  $(5.6 \times 10^{-3}) \div (2.4 \times 10^{-5})$ .

Write your answer in standard form.

..... [2]

22



NOT TO SCALE

The diagram shows a garden.  
 The garden has a circular pond and the shaded area is grass.  
 The width of the grass area is equal to the diameter of the pond.

(a) Find the area of the pond.

..... m<sup>2</sup> [2]

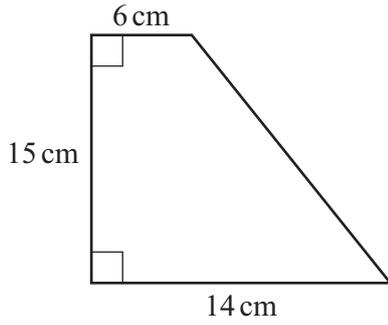
(b) Find the area of the grass.

..... m<sup>2</sup> [2]

(c) Find the percentage of the garden that is grass.

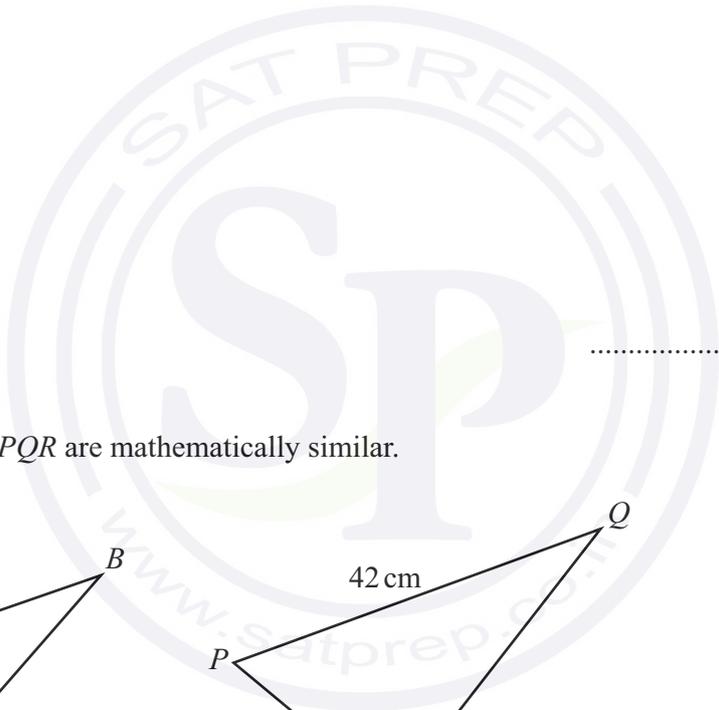
..... % [2]





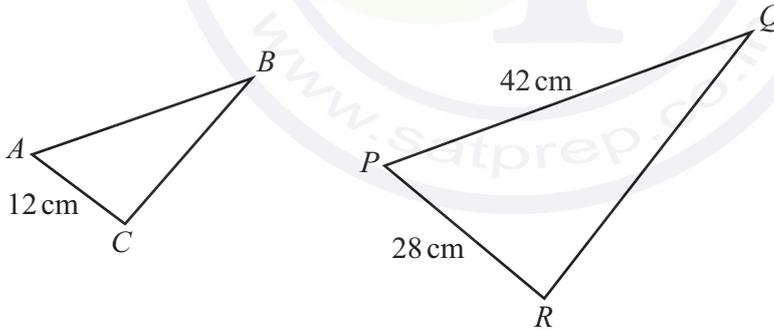
NOT TO SCALE

Calculate the perimeter of this trapezium.



..... cm [4]

24 Triangles  $ABC$  and  $PQR$  are mathematically similar.



NOT TO SCALE

Calculate  $AB$ .

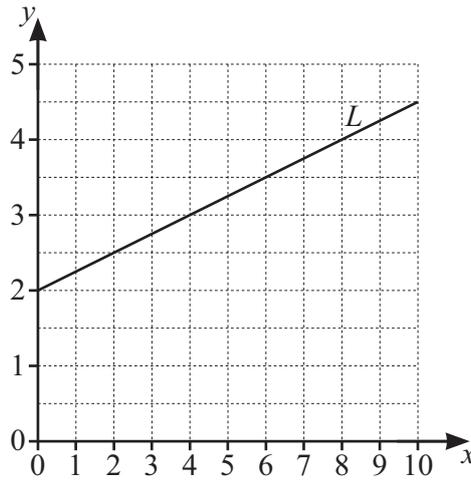
$AB =$  ..... cm [2]



DO NOT WRITE IN THIS MARGIN



25 (a) The grid shows line  $L$ .



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

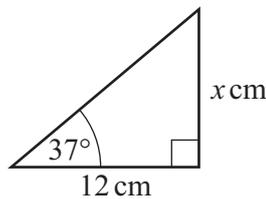
$y = \dots\dots\dots$  [3]

(b) Another line,  $R$ , has equation  $y = -3x + 5$ .

Find the equation of the line which is parallel to  $R$  and goes through the point  $(1, 5)$ .  
Give your answer in the form  $y = mx + c$ .

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

26 The diagram shows a right-angled triangle.



NOT TO SCALE

Calculate the value of  $x$ .

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



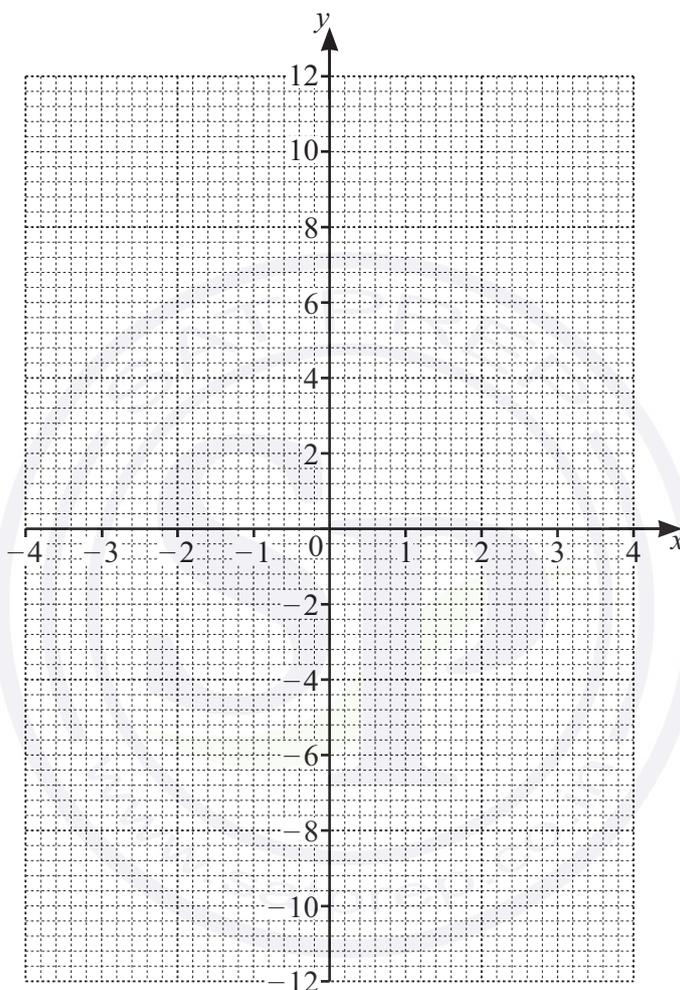


27 (a) Complete the table of values for  $y = \frac{12}{x}$ .

x	-4	-3	-2	-1		1	2	3	4
y		-4	-6				6	4	

[2]

(b) On the grid, draw the graph of  $y = \frac{12}{x}$  for  $-4 \leq x \leq -1$  and  $1 \leq x \leq 4$ .



[4]

(c) Use your graph to write down the solution of the equation  $\frac{12}{x} = 10$ .

x = ..... [1]

Question 28 is printed on the next page.



DO NOT WRITE IN THIS MARGIN



- 28 Ali invests \$2950 in an account paying 12% compound interest.  
Bob invests \$3000 in an account paying 12% simple interest.

Show that after 3 years Ali has a larger investment than Bob.

[5]



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**MATHEMATICS**

**0580/33**

Paper 3 Calculator (Core)

**October/November 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  $\pi$ , 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 **16** pages.

## 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  $h$ .  $V = \pi r^2 h$

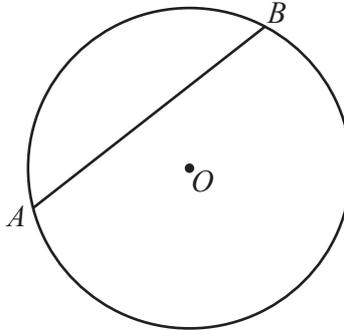
Volume,  $V$ , of cone of radius  $r$ , height  $h$ .  $V = \frac{1}{3}\pi r^2 h$

Volume,  $V$ , of sphere of radius  $r$ .  $V = \frac{4}{3}\pi r^3$

1 Write down all the factors of 26.

..... [2]

2



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

(a) Write down the mathematical name of the line  $AB$ .

..... [1]

(b) On the diagram, draw a radius.

[1]

3 (a) Write 0.25 as a fraction.

..... [1]

(b) Write  $\frac{1}{2}$  as a percentage.

.....% [1]

(c) Write 7% as a decimal.

..... [1]

4

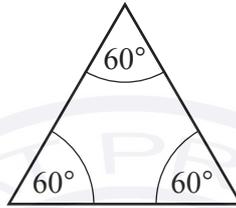
4 (a)



Write down the mathematical name of this solid.

..... [1]

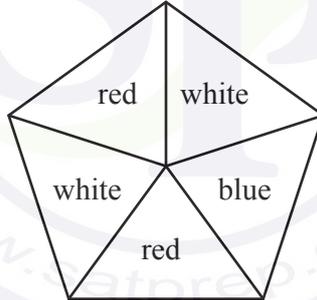
(b)



Write down the mathematical name of this type of triangle.

..... [1]

5



The diagram shows a fair 5-sided spinner.  
The spinner is spun once.

(a) Write down the colour the spinner is least likely to land on.

..... [1]

(b) Find the probability that the spinner lands on white.

..... [1]

(c) Find the probability that the spinner does not land on red.

..... [1]

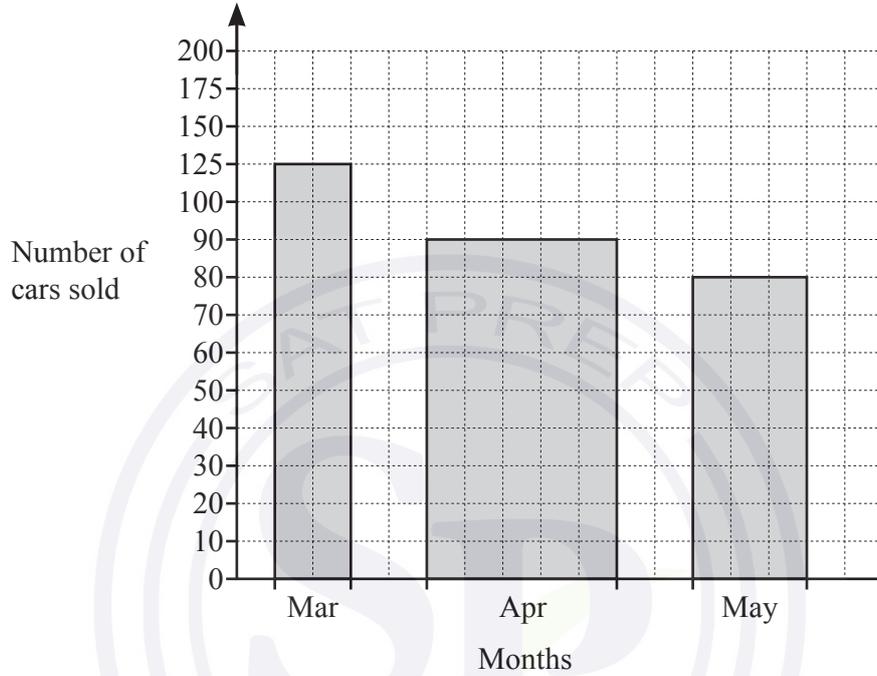
6 (a) Write down the reciprocal of 8.

..... [1]

(b) Work out  $19^3$ .

..... [1]

7



A newspaper prints this bar chart to show the number of cars sold by a garage in March, April and May.

Give two reasons why the bar chart is incorrect.

1 .....

.....

2 .....

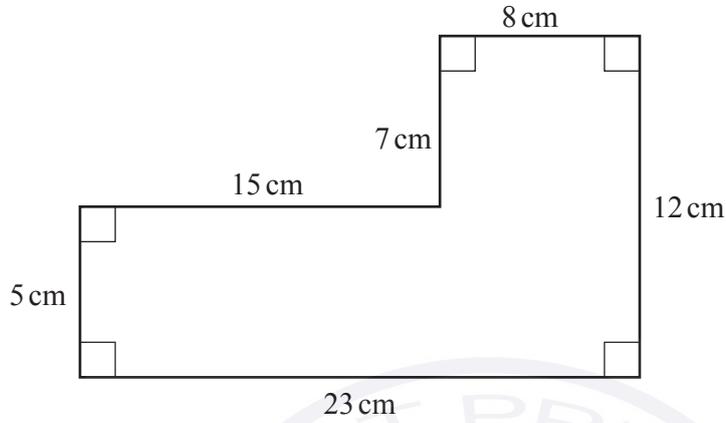
.....

[2]

8 Work out the number of seconds in six and a half hours.

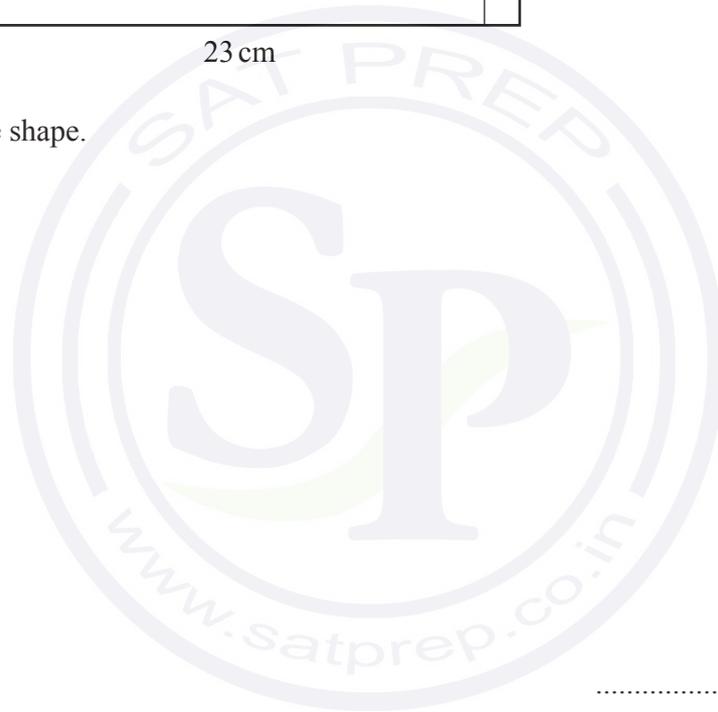
..... seconds [1]

9



NOT TO SCALE

Find the area of the shape.



..... cm<sup>2</sup> [2]

- 10 (a) Jason records his score in each of 10 games of cricket.

16	7	21	8	20	9	11	7	14	3
----	---	----	---	----	---	----	---	----	---

- (i) Find the mode.

..... [1]

- (ii) Work out the range.

..... [1]

- (b) Ed plays 5 games.  
His mean score is 28.  
After one more game his mean score is now 26.

Work out his score in the sixth game.

..... [2]

- 11 Calculate 19% of \$46.25 .  
Give your answer correct to the nearest cent.

\$ ..... [2]

- 12 (a) Simplify.

$$5b - 8c + 2b - 3c$$

..... [2]

- (b)  $q = 3r + 5t$

Find the value of  $t$  when  $q = 37$  and  $r = 4$ .

$t =$  ..... [2]

13 Divide \$136 in the ratio 3 : 5.

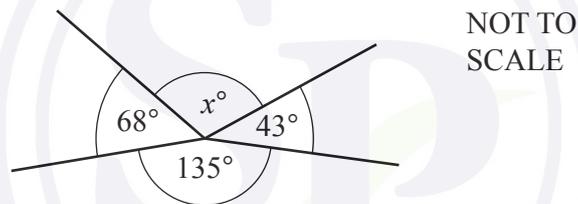
\$..... , \$..... [2]

14 Carl packs pens into boxes.  
Each box holds 68 pens.  
Carl has 980 pens and 14 boxes.

Does Carl have enough boxes to pack all the pens?  
Show how you decide.

..... because ..... [2]

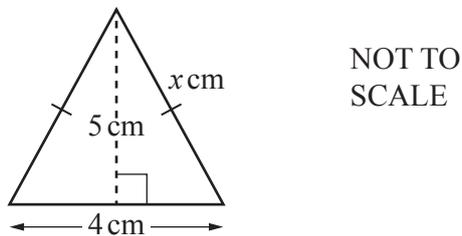
15



Find the value of  $x$ .

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

16



The diagram shows an isosceles triangle.

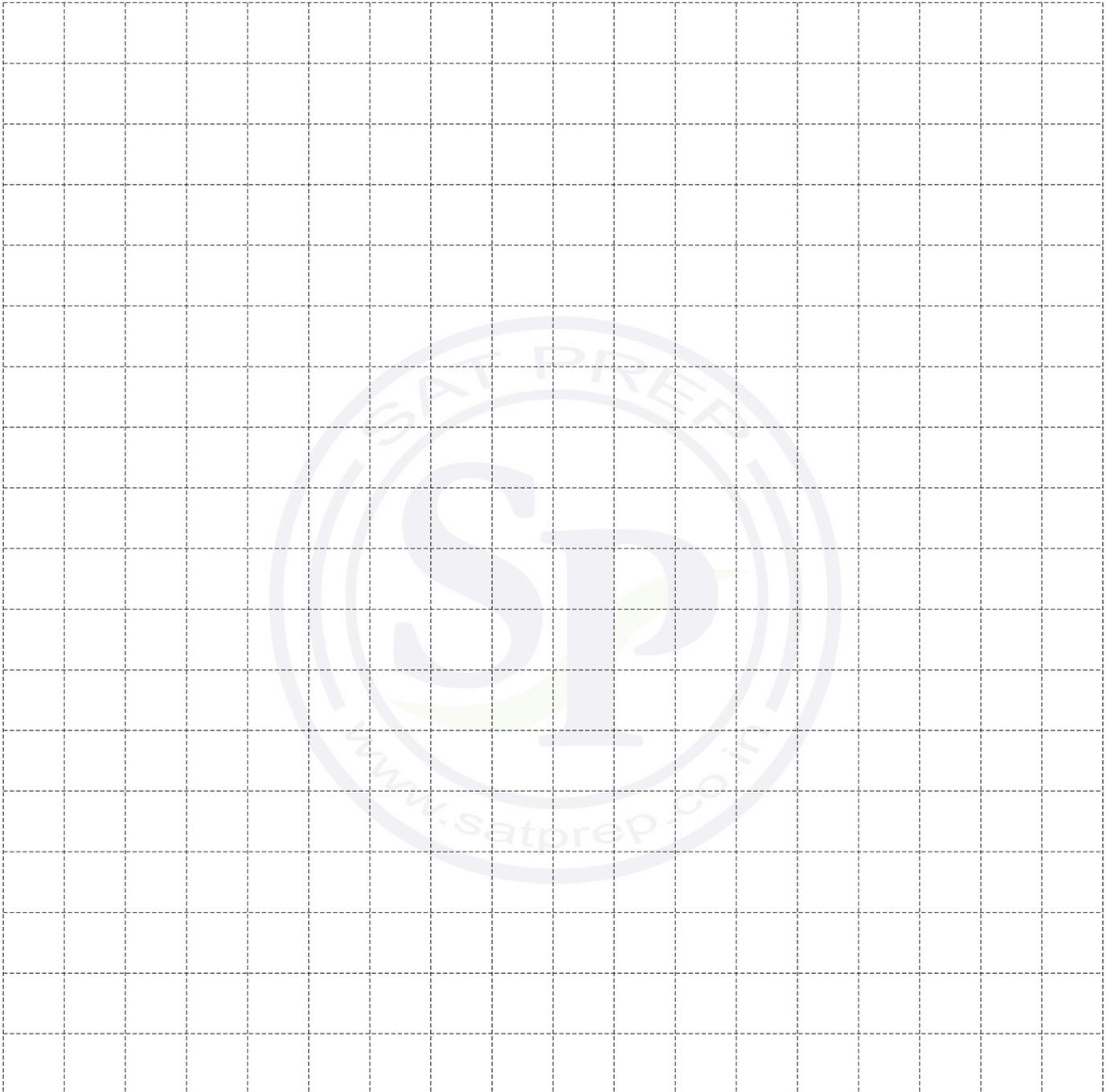
(a) Calculate the value of  $x$ .

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

(b) The triangle is one face of a square-based pyramid.

Each triangular face of the pyramid is the same.

On the  $1\text{ cm}^2$  grid, draw a net of this pyramid.



[3]

17 Write 46.179 correct to 4 significant figures.

..... [1]

18 Calculate.

(a)  $\sqrt{\frac{8.4^2 + 9.3}{26.5}}$

..... [1]

(b)  $4^{-3}$

..... [1]

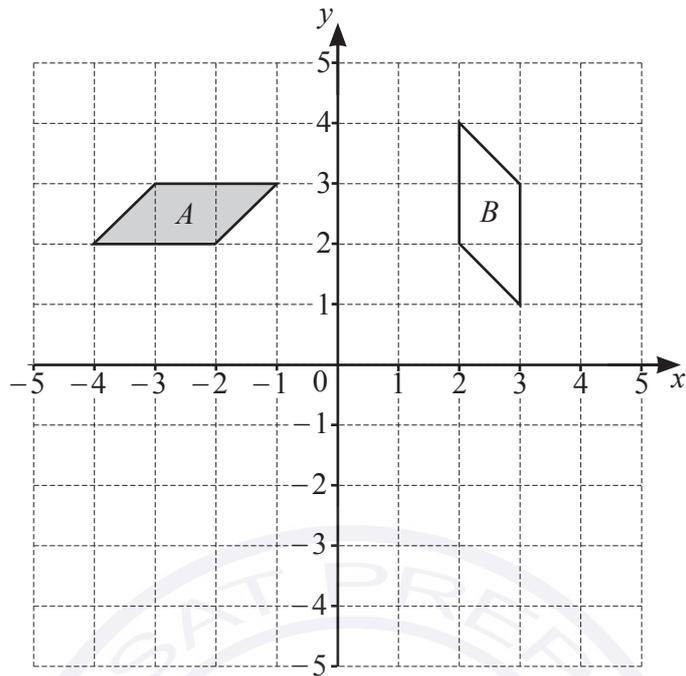
19 Expand and simplify.

$$3(5x + 2) - 4(x + 1)$$

..... [2]

20 *Due to an issue with question 20, the question has been removed from the question paper.*

21 The diagram shows shapes  $A$  and  $B$ .



(a) Describe fully the **single** transformation that maps shape  $A$  onto shape  $B$ .

.....  
 ..... [3]

(b) On the grid, draw the image of shape  $A$  after a reflection in the line  $y = 0$ .

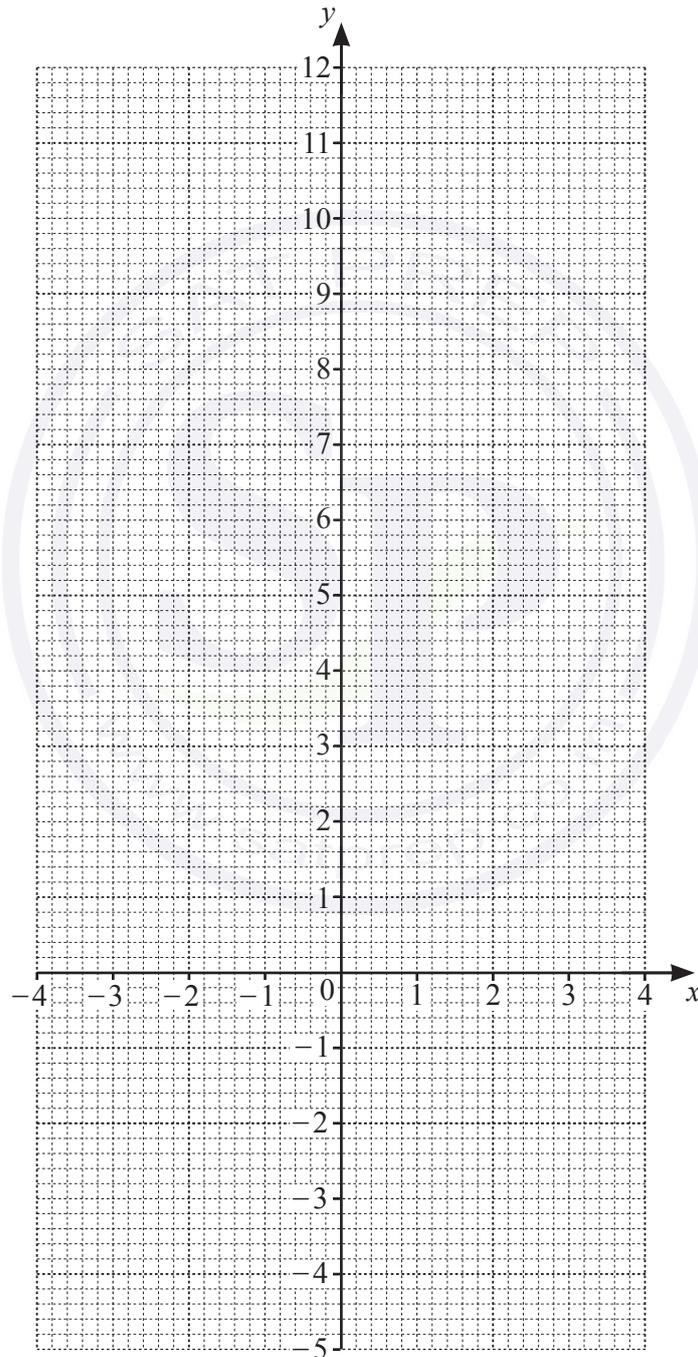
[2]

22 (a) Complete the table of values for  $y = x^2 - 4$ .

$x$	-4	-3	-2	-1	0	1	2	3	4
$y$	12		0	-3		-3	0		12

[2]

(b) On the grid, draw the graph of  $y = x^2 - 4$  for  $-4 \leq x \leq 4$ .



[4]

- 23 (a) Jo buys a candle for \$3.20 .  
She sells the candle for \$4.64 .

Find the percentage profit on the candle.

.....% [2]

- (b) The candle is in the shape of a cone.  
The volume of the candle is  $900 \text{ cm}^3$ .  
The height of the candle is 8 cm.

Calculate the radius of the candle.

..... cm [3]

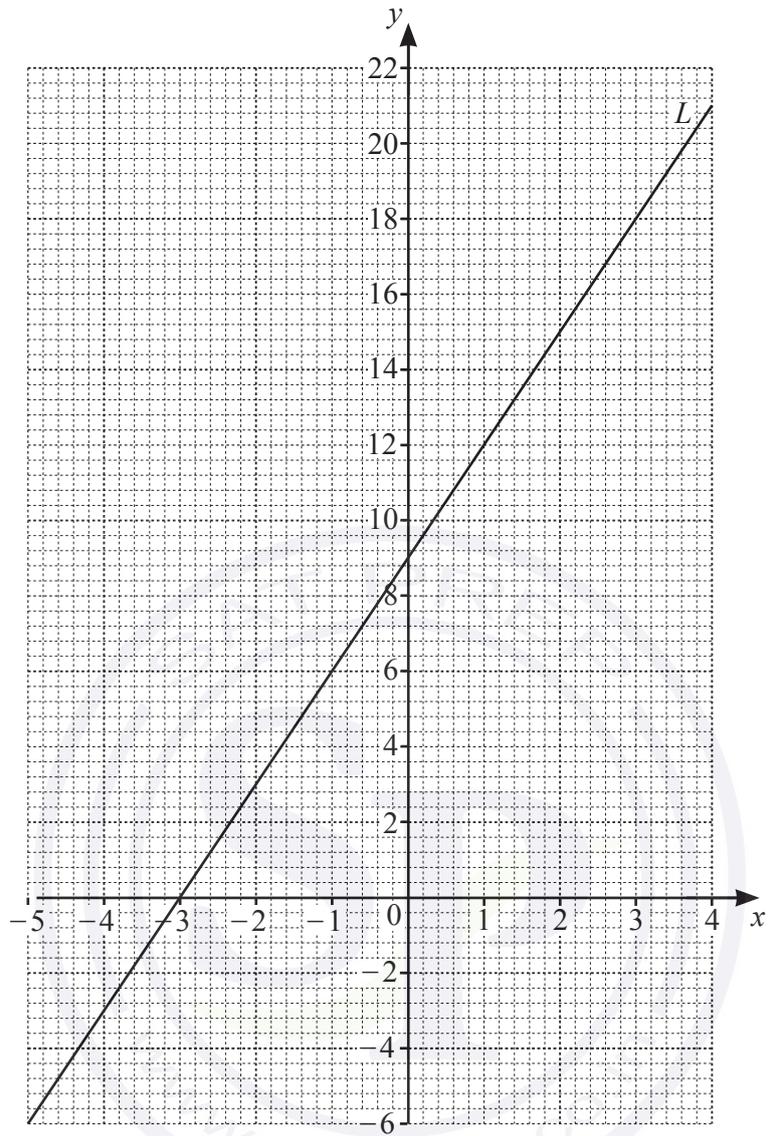
- 24 Make  $p$  the subject of the formula  $m = 9p + 32$ .

$p =$  ..... [2]

- 25 Find the lowest common multiple (LCM) of 20 and 36.

..... [2]

26 Line  $L$  is drawn on the grid.

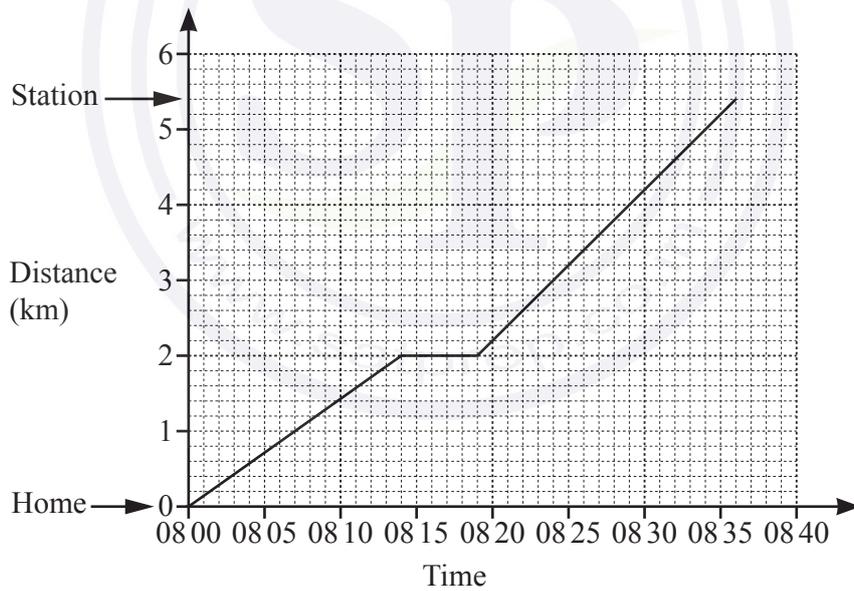


Find the equation of line  $L$  in the form  $y = mx + c$ .

$y = \dots\dots\dots$  [3]

27 Due to an issue with question 27, the question has been removed from the question paper.

28 The travel graph shows Chi's journey from home to the station.

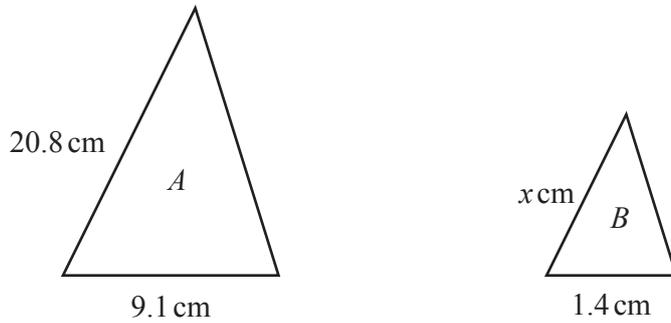


Calculate Chi's average speed for the whole journey.  
Give your answer in kilometres per hour.

..... km/h [3]

**Question 29 is printed on the next page.**

29 (a)

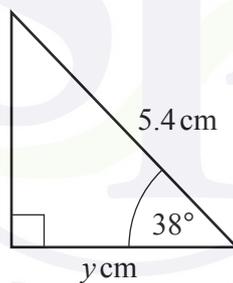


NOT TO SCALE

The diagram shows two similar triangles,  $A$  and  $B$ .

Calculate the value of  $x$ .

(b)



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

The diagram shows a right-angled triangle.

Calculate the value of  $y$ .

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

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## MATHEMATICS

0580/31

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.
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- 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  $\pi$ , 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 16 pages.

**List of formulas**

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Circumference,  $C$ , of circle of radius  $r$ .  $C = 2\pi r$

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





1 The pictogram shows the number of goals scored by teams *A*, *B* and *C*.

Team	Goals
<i>A</i>	
<i>B</i>	
<i>C</i>	
<i>D</i>	

Key : represents 4 goals

(a) Work out the number of goals scored by team *B*.

..... [1]

(b) Teams *A*, *B*, *C* and *D* scored a total of 43 goals.

Complete the pictogram.

[3]

2 An angle measures  $157^\circ$ .

Write down the mathematical name for this type of angle.

..... [1]

3 Find the value of  $\sqrt{1.96}$ .

..... [1]

4 Calculate the number of months in 5 years.

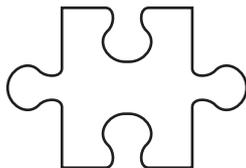
..... [1]



DO NOT WRITE IN THIS MARGIN



5



(a) Write down the order of rotational symmetry for this shape.

..... [1]

(b) Draw all the lines of symmetry on this shape.

[2]

6 In triangle  $ABC$ ,  $AC = 6.4$  cm and  $BC = 5.3$  cm.

**Using a ruler and compasses only**, construct triangle  $ABC$ .

Leave in your construction arcs.

The line  $AB$  has been drawn for you.



[2]

7 Solve.

$$3y = 18$$

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



DO NOT WRITE IN THIS MARGIN



8 (a)  $T = 3(5P - 8) + 4$

Find the value of  $T$  when  $P = 12$ .

$T = \dots\dots\dots$  [2]

(b)  $W = 4t + 8$

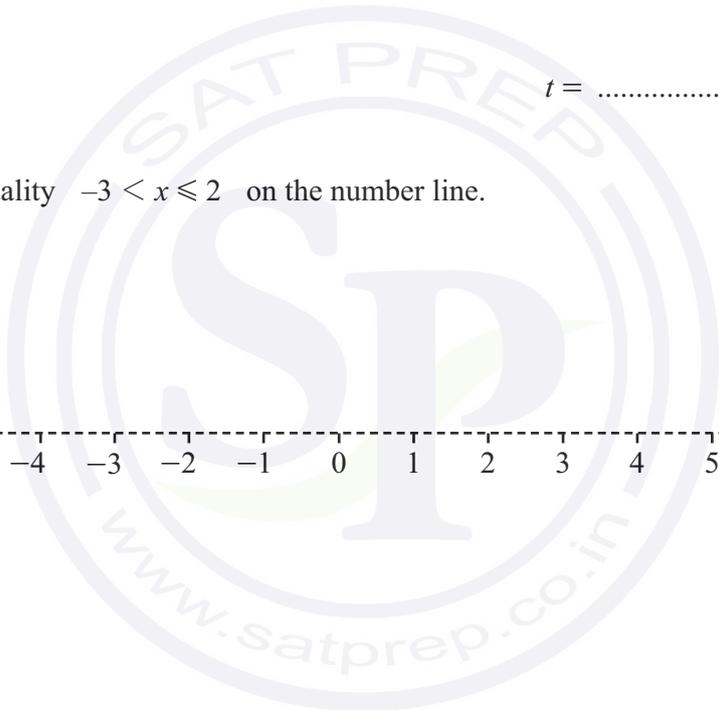
Find the value of  $t$  when  $W = 369$ .

$t = \dots\dots\dots$  [2]

9 Represent the inequality  $-3 < x \leq 2$  on the number line.



[2]





10

$\frac{3}{7}$

0.41

$\frac{17}{41}$

42%

Write these numbers in order, starting with the smallest.

..... < ..... < ..... < ..... [2]  
*smallest*

11 A plane leaves Seattle at 0730 on Tuesday and arrives in Seoul 10 hours and 55 minutes later. The local time in Seoul is 16 hours ahead of the local time in Seattle.

Work out the day and time in Seoul when the plane arrives.

Day ..... Time ..... [3]

12 The equation of line  $L$  is  $y = 5x - 3$ .

(a) Write down the gradient of line  $L$ .

..... [1]

(b) Write down the equation of a line parallel to line  $L$ .

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





DO NOT WRITE IN THIS MARGIN

- 13 The scale drawing shows the position of ship *A*.  
The scale is 1 centimetre represents 50 kilometres.



Scale: 1 cm to 50 km

Ship *B* is 300 km from ship *A* on a bearing of  $105^\circ$ .

On the scale drawing mark the position of ship *B*.

[2]

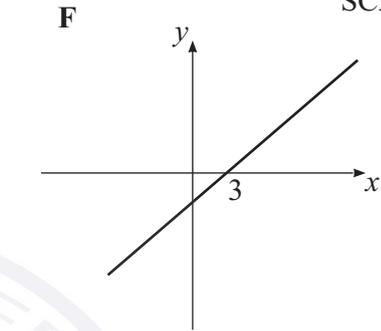
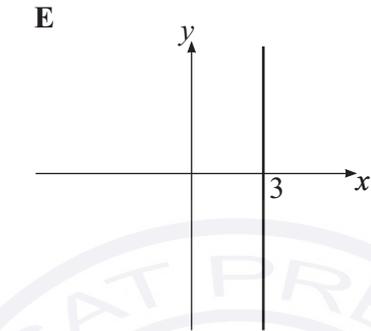
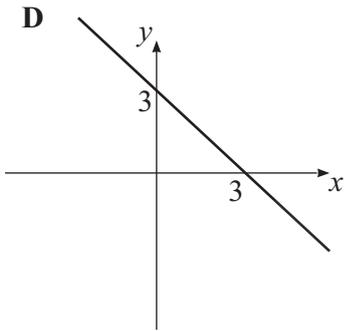
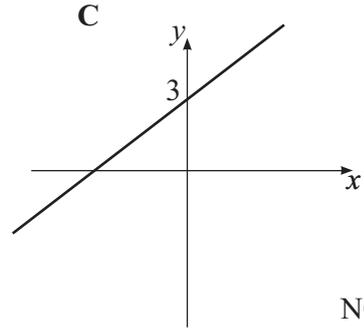
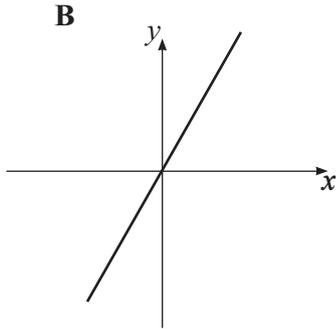
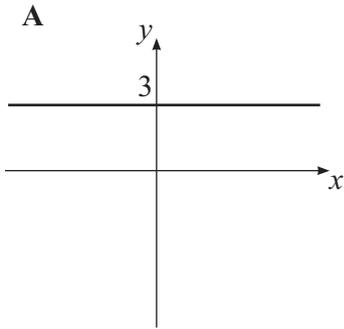
- 14 Tom needs 225 g of flour to make 10 cakes.  
A shop sells flour in 500 g bags.

Work out the number of bags of flour Tom needs to make 70 cakes.

..... [3]



15



NOT TO SCALE

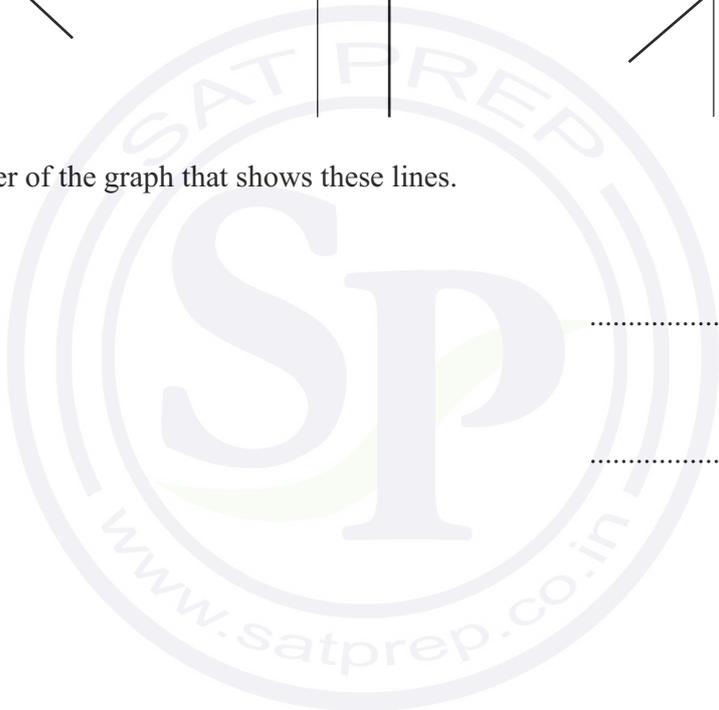
Write down the letter of the graph that shows these lines.

(a)  $x = 3$

..... [1]

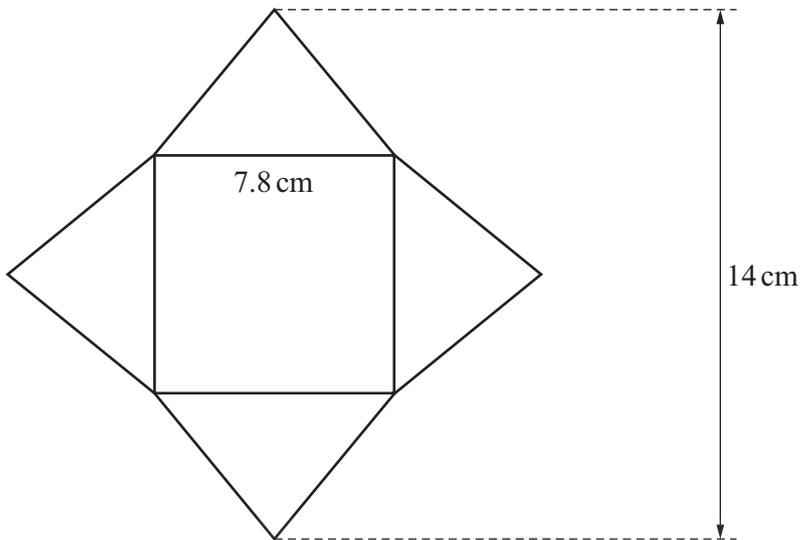
(b)  $y = 3x$

..... [1]



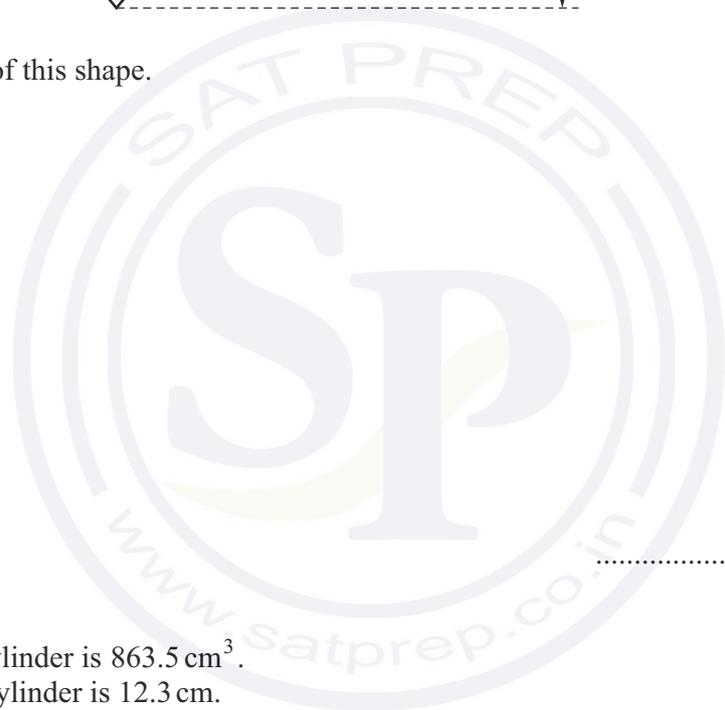


16 The diagram shows a shape made from a square and four congruent isosceles triangles.



NOT TO SCALE

Work out the area of this shape.



..... cm<sup>2</sup> [3]

17 The volume of a cylinder is 863.5 cm<sup>3</sup>.  
The height of the cylinder is 12.3 cm.

Find the radius of the cylinder.

..... cm [3]



DO NOT WRITE IN THIS MARGIN



- 18 Dara changes 5700 Thai baht to dollars.  
The exchange rate is \$1 = 34.18 Thai baht.

Calculate the amount that Dara receives.

\$ ..... [1]

- 19 A four-sided dice is numbered 1 to 4.  
Hrishi throws the dice 50 times.  
The results are shown in the table.

Number	Frequency
1	14
2	15
3	9
4	12

Calculate the mean.

..... [2]

- 20 A tin contains red, yellow, green and brown sweets.  
The table shows some of the probabilities of picking a sweet of each colour at random.

Colour	Red	Yellow	Green	Brown
Probability	0.68		0.05	0.14

Complete the table.

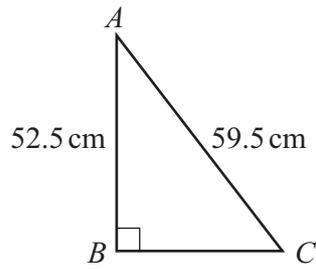
[2]





DO NOT WRITE IN THIS MARGIN

21 The diagram shows a right-angled triangle  $ABC$ .



NOT TO SCALE

Calculate  $BC$ .

$BC = \dots\dots\dots$  cm [3]

22 (a) Anil invests \$2000 and Baz invests \$7500.

Write the ratio money invested by Anil : money invested by Baz in its simplest form.

$\dots\dots\dots : \dots\dots\dots$  [1]

(b) Kamil and Lavik share some money in the ratio Kamil : Lavik = 5 : 9.  
Lavik receives \$72 more than Kamil.

Calculate the total amount of money they share.

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

(c) Vanisha invests \$4000 for 5 years at a rate of 3.5% per year compound interest.

Calculate the total interest earned during the 5 years.

\$  $\dots\dots\dots$  [3]



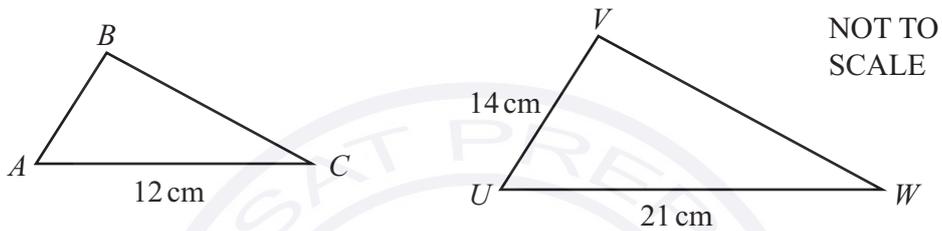


23 The population of an island increases from 18 400 to 19 780.

Calculate the percentage increase.

..... % [2]

24



NOT TO SCALE

Triangle  $ABC$  is mathematically similar to triangle  $UVW$ .

Calculate  $AB$ .

$AB =$  ..... cm [2]

25 A bar of gold in the shape of a cuboid has dimensions 2 cm by 4 cm by 6.5 cm. The density of gold is  $19.32\text{ g/cm}^3$ .

Calculate the mass of this bar of gold.

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

..... g [3]



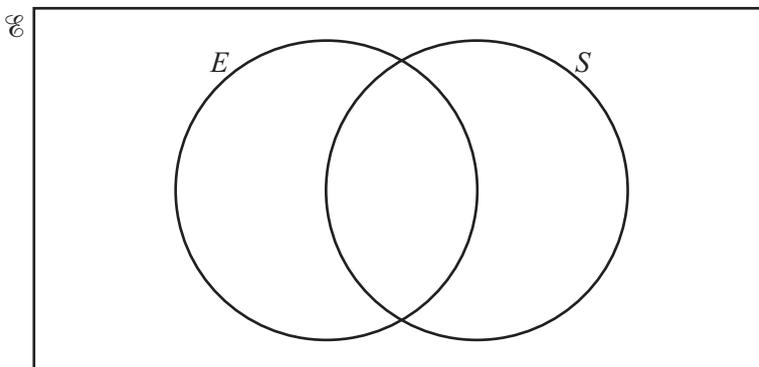


26 Li asks 28 students if they speak English ( $E$ ) and if they speak Spanish ( $S$ ).

15 students speak English.

12 students speak Spanish.

6 do not speak English and do not speak Spanish.



(a) Complete the Venn diagram.

[2]

(b) Write down how many students speak English but do not speak Spanish.

(c) Find  $n(E \cup S)$ .

[1]

[1]

27 The height,  $h$  metres, of a building is 105 m, correct to the nearest metre.

Complete this statement about the value of  $h$ .

.....  $\leq h <$  ..... [2]



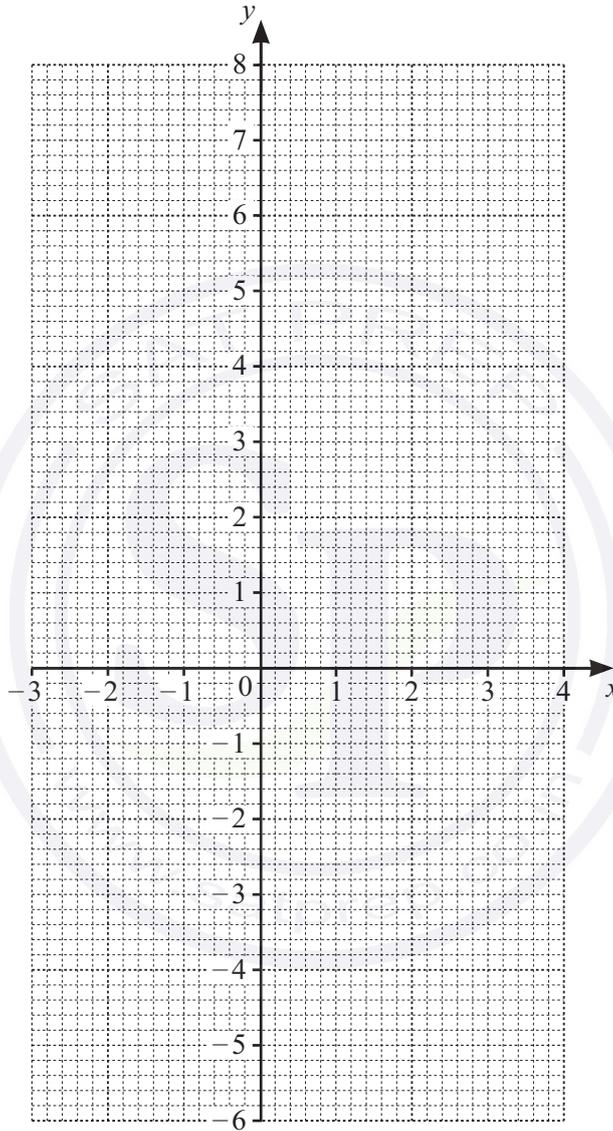
DO NOT WRITE IN THIS MARGIN

28 (a) (i) Complete the table of values for  $y = x^2 - x - 5$ .

$x$	-3	-2	-1	0	1	2	3	4
$y$		1	-3			-3	1	

[2]

(ii) On the grid, draw the graph of  $y = x^2 - x - 5$  for  $-3 \leq x \leq 4$ .



[4]

(b) Write down the equation of the line of symmetry of the graph.

..... [1]

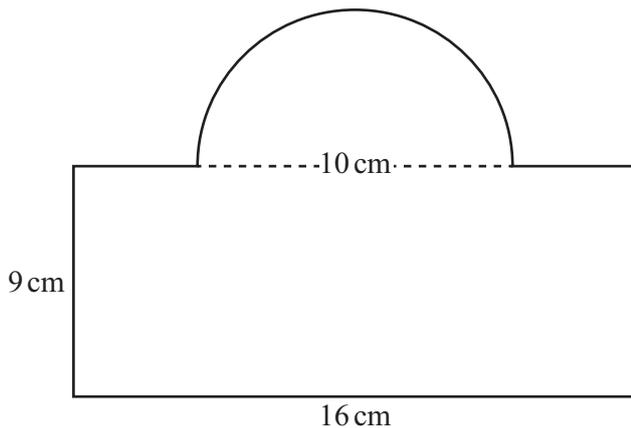
(c) Use the graph to solve the equation  $x^2 - x - 5 = 0$ .

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





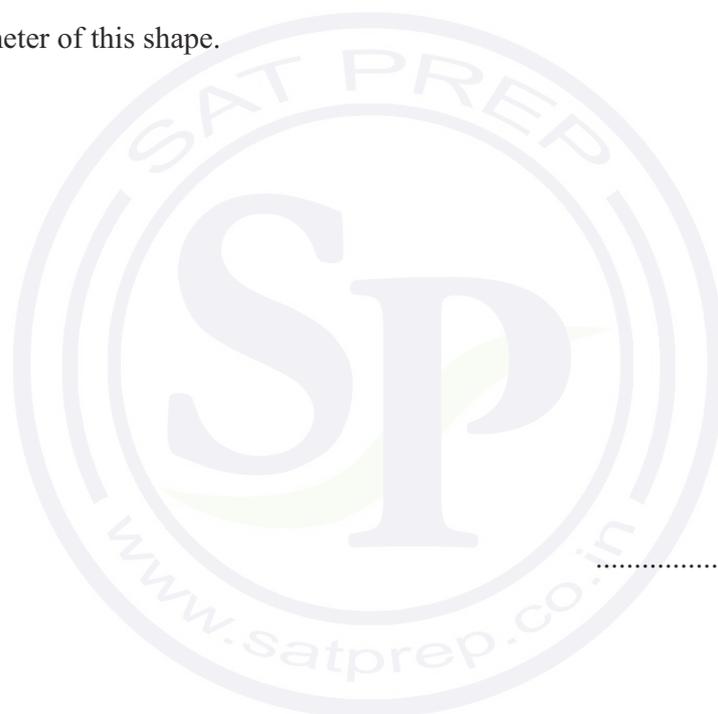
29



NOT TO SCALE

This shape is made from a rectangle and a semicircle.  
The diameter of the semicircle is 10 cm.

Calculate the perimeter of this shape.

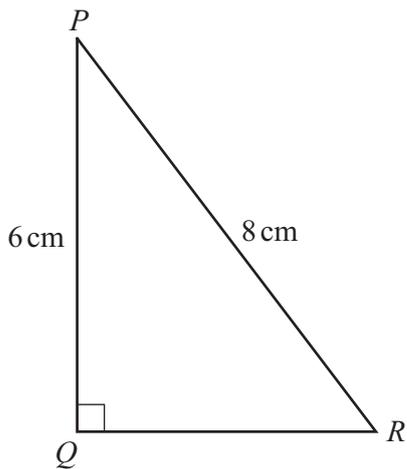


..... cm [3]

Question 30 is printed on the next page.



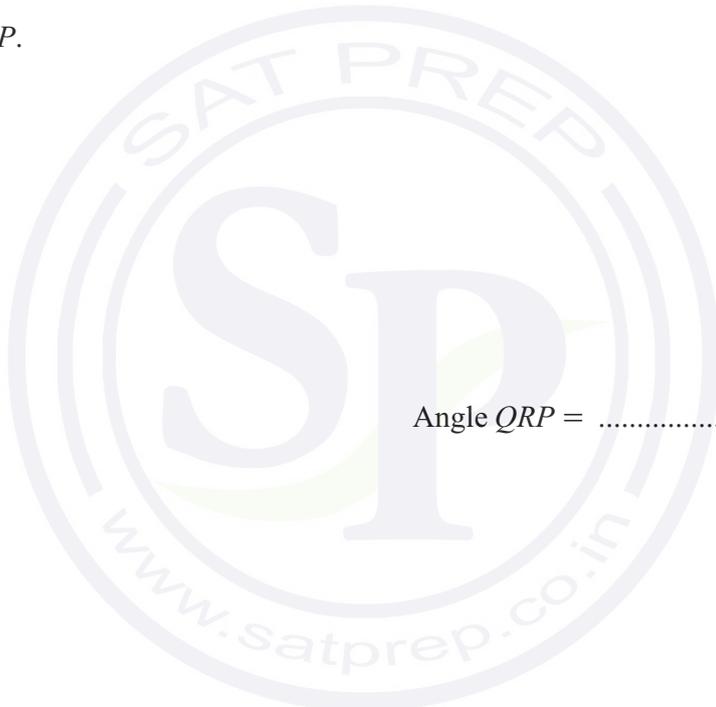
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NOT TO SCALE

The diagram shows a right-angled triangle,  $PQR$ .

Calculate angle  $QRP$ .



Angle  $QRP = \dots\dots\dots [2]$

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# Cambridge IGCSE™

CANDIDATE NAME



CENTRE NUMBER

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CANDIDATE NUMBER

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## MATHEMATICS

0580/32

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  $\pi$ , 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 **16** pages.



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



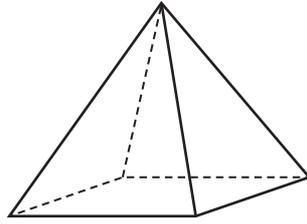


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1 Write 3.45 pm using the 24-hour clock.

..... [1]

2



The diagram shows a square-based pyramid.

Complete this statement.

The pyramid has ..... edges and ..... vertices. [2]

3 Convert 3 m into mm.

..... mm [1]

4 Apples cost \$1.20 per kilogram and one banana costs 35 cents.

(a) Work out the total cost, in dollars, of 3 kg of apples and 7 bananas.

\$ ..... [3]

(b) Work out the change from \$20.

\$ ..... [1]

5 A student scores 58 out of 80 in a test.

Calculate their percentage score.

..... % [1]





6 Calculate 57% of 45.

..... [2]

7 A train leaves station *A* at 13 44.  
The train arrives at station *B* after 3 hours and 30 minutes.

(a) Work out the time the train arrives at station *B*.

..... [1]

(b) The distance between station *A* and station *B* is 210 km.

Calculate the average speed of the train in km/h.

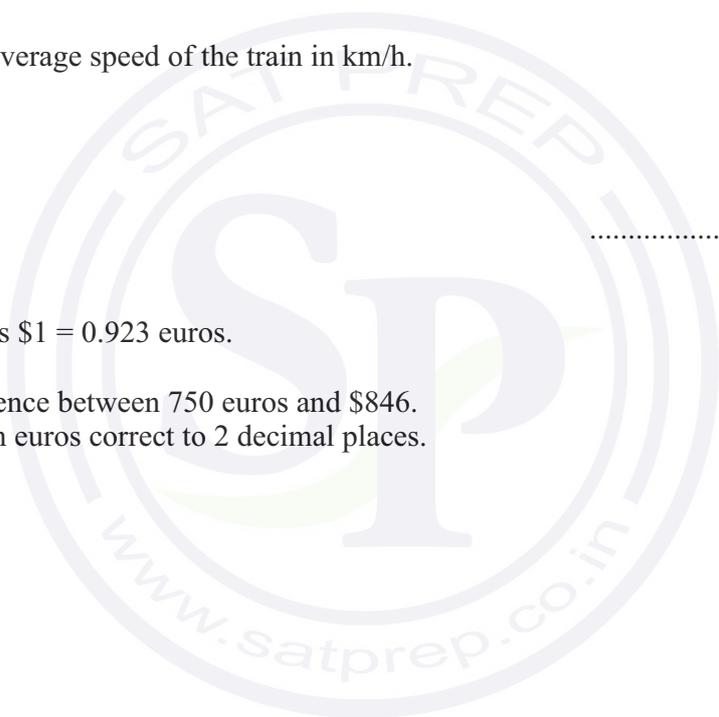
..... km/h [1]

8 The exchange rate is \$1 = 0.923 euros.

Calculate the difference between 750 euros and \$846.  
Give your answer in euros correct to 2 decimal places.

..... euros [3]

DO NOT WRITE IN THIS MARGIN





9 Flo has a bag of counters.  
 She picks a counter at random from the bag.  
 The probability that she picks a green counter is 0.52 .

(a) Work out the probability that she does **not** pick a green counter.

..... [1]

(b) The bag contains three colours of counters, green, pink and red.

Colour of counter	Green	Pink	Red
Probability	0.52		

There are three times as many pink counters as red counters.

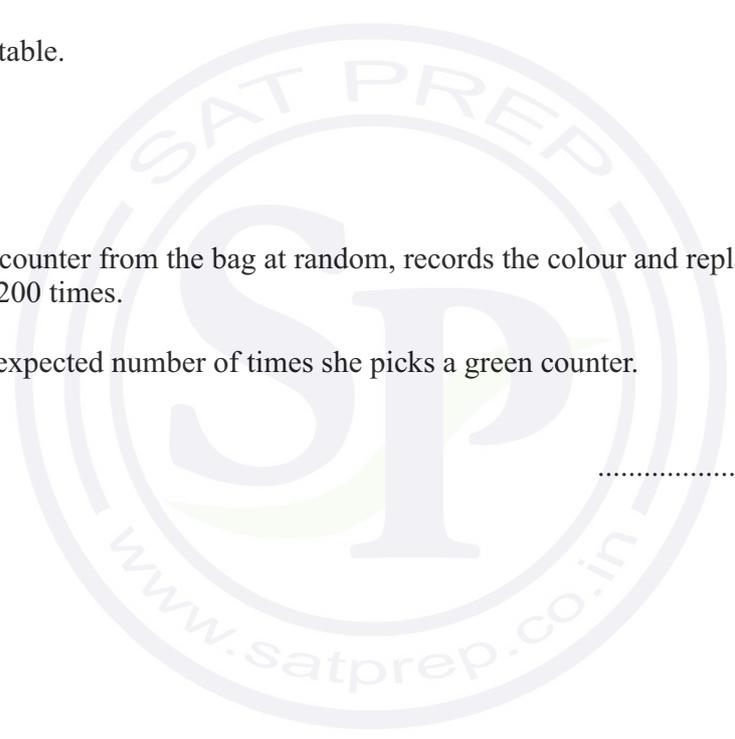
Complete the table.

[2]

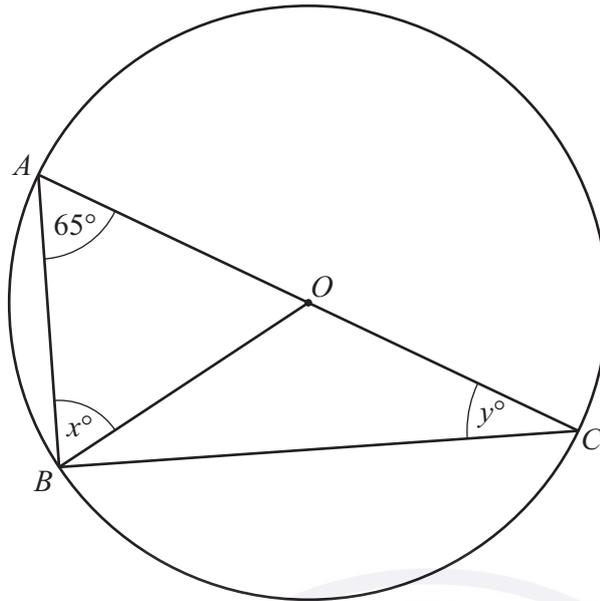
(c) Flo picks one counter from the bag at random, records the colour and replaces it in the bag.  
 She does this 200 times.

Calculate the expected number of times she picks a green counter.

..... [1]



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NOT TO SCALE

$A$ ,  $B$  and  $C$  are points on a circle, centre  $O$ , diameter  $AC$ .

Complete these statements, giving geometrical reasons.

- (a) The value of  $x$  is ..... because ..... [2]
- (b) Angle  $ABC = 90^\circ$  because ..... [1]
- (c) The value of  $y$  is ..... because ..... [2]



- 11 The scale drawing shows the position of a hospital, *H*.  
The scale is 1 centimetre represents 6 kilometres.

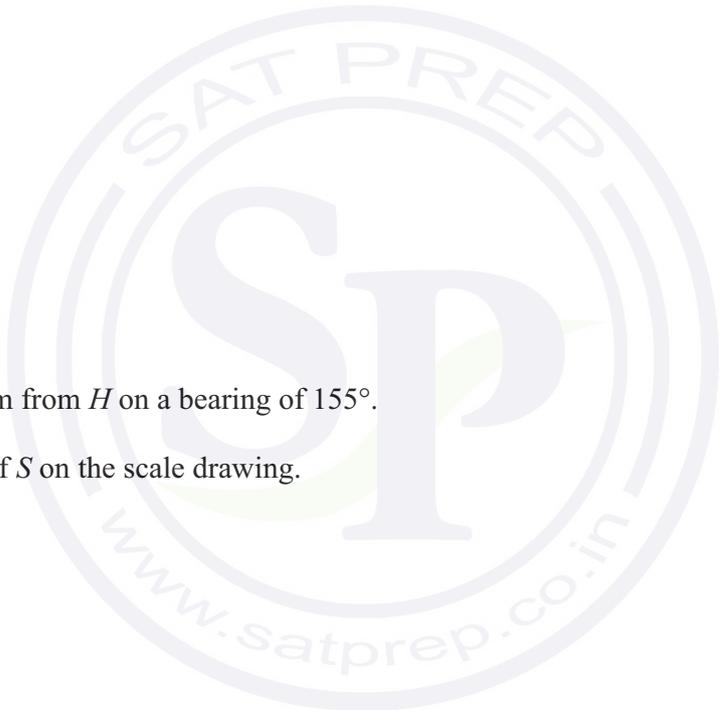


Scale: 1 cm to 6 km

A school, *S*, is 33 km from *H* on a bearing of  $155^\circ$ .

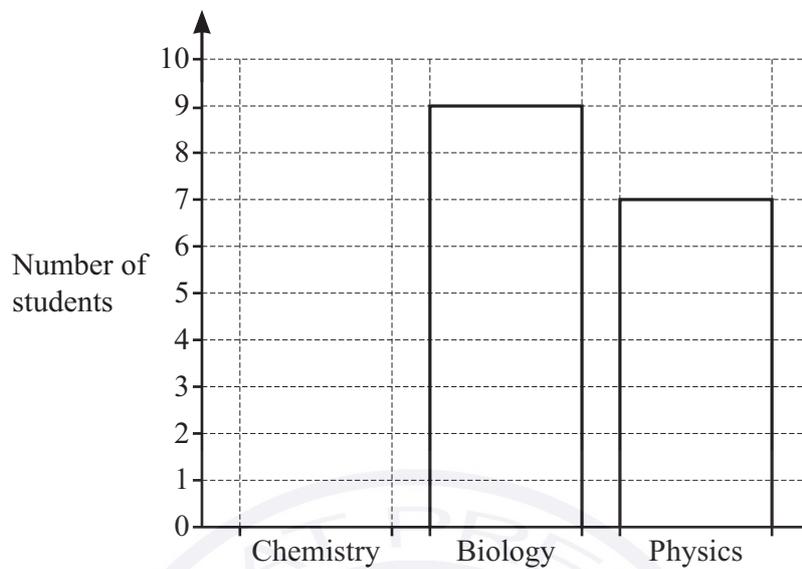
Mark the position of *S* on the scale drawing.

[2]

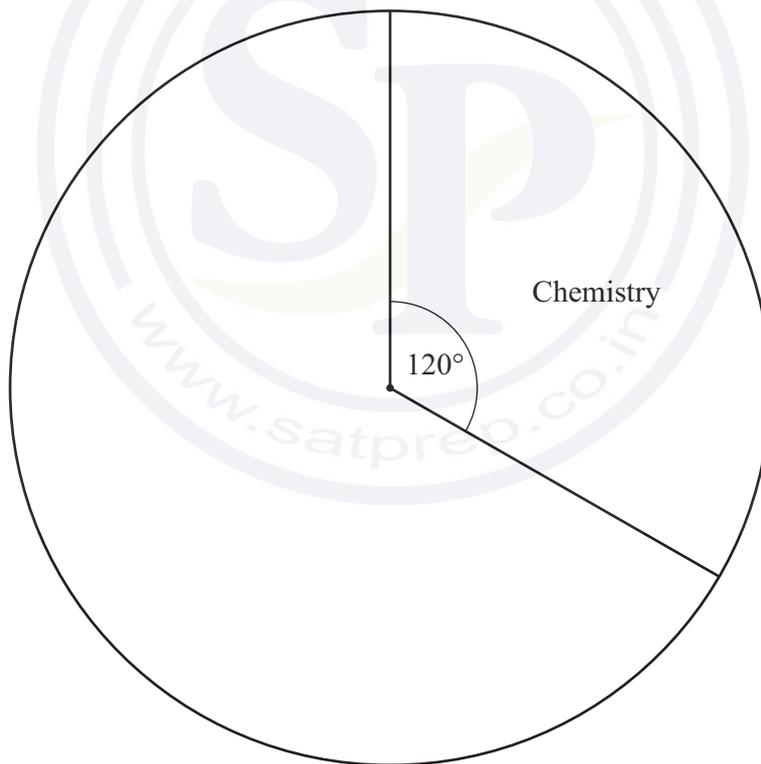


12 (a) Kim and Tom ask some students if they prefer Chemistry, Biology or Physics.

Kim draws the bars for Biology and Physics on a bar chart.



Tom draws the sector for Chemistry on a pie chart.





Use the information from both diagrams to complete

(i) the bar chart

[2]

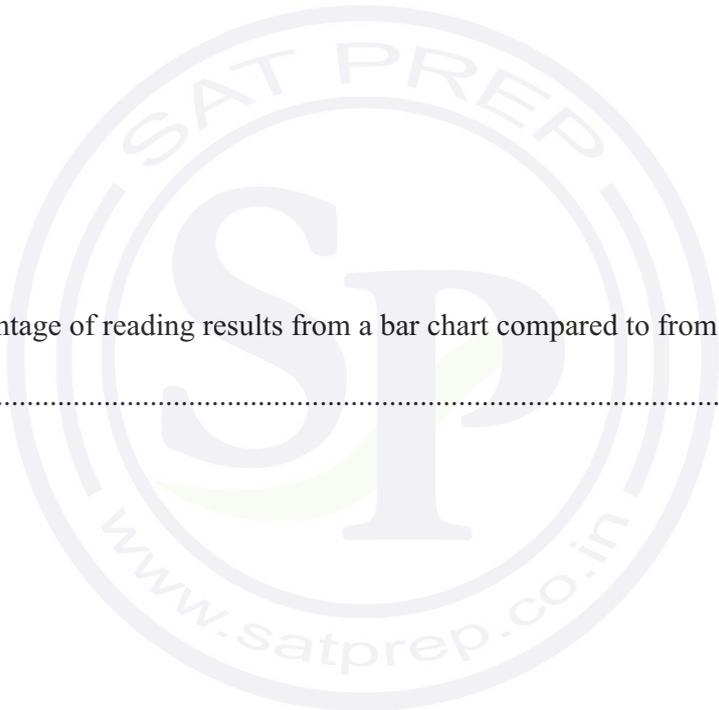
(ii) the pie chart.

[4]

(b) Give one advantage of reading results from a bar chart compared to from a pie chart.

[1]

.....



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13 (a) 2, *e*, *f*, 20, ...

A linear sequence has a first term of 2 and a fourth term of 20.  
The term-to-term rule for this sequence is add *k*.

Work out the values of *e*, *f* and *k*.

*e* = .....

*f* = .....

*k* = .....

[3]

(b) These are the first four terms of another sequence.

9 7 5 3

Find the *n*th term.

..... [2]

14 (a)  $P = 6a + 5b$

Find the value of *b* when  $P = 25$  and  $a = 3$ .

*b* = ..... [2]

(b) Make *T* the subject of the formula  $W = kT + y$ .

*T* = ..... [2]





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15 The equation of a line is  $y = -5x + 7$ .

(a) Write down the gradient of this line.

..... [1]

(b) Find the coordinates of the point where this line crosses the  $y$ -axis.

( ..... , ..... ) [1]

16 (a) Sam spends \$187 on electricity and gas.  
The ratio electricity : gas = 8 : 3 .

Work out how much Sam spends on electricity.

\$ ..... [2]

(b) Jai spends \$180 on electricity and \$150 on gas.

Write down the ratio electricity : gas in its simplest form.

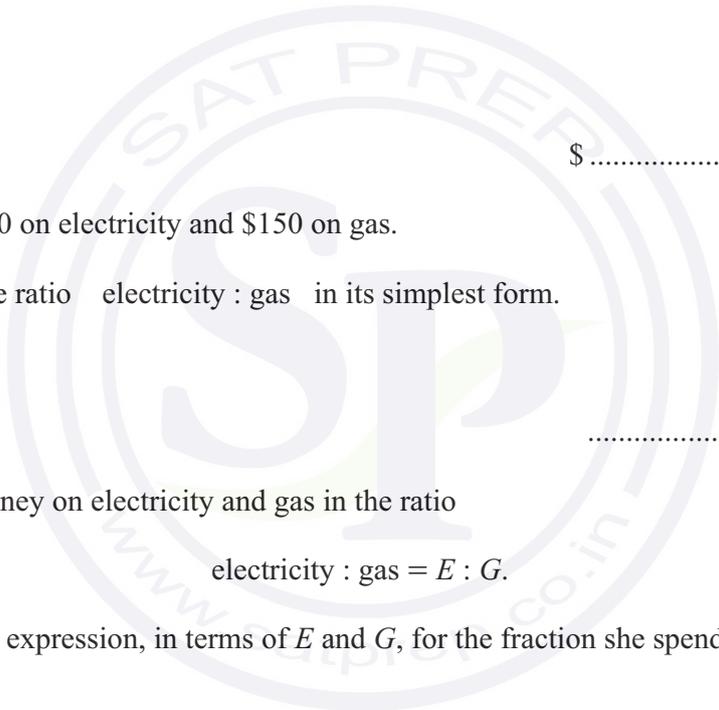
..... : ..... [1]

(c) Kat spends money on electricity and gas in the ratio

electricity : gas =  $E : G$ .

Write down an expression, in terms of  $E$  and  $G$ , for the fraction she spends on gas.

..... [1]





17 Rick invests \$6000 for 5 years at a rate of 9% per year compound interest.

Calculate the total interest earned during the 5 years.

\$ ..... [3]

18 A factory produces brass at a rate of 172 kilograms per hour.

(a) Convert this rate into grams per second.

.....g/s [2]

(b) The rate is increased to 176 kilograms per hour.

Calculate the percentage increase in the rate.

..... % [2]

19 (a) Write 0.000 000 0347 in standard form.

..... [1]

(b) Calculate  $3 \times 10^4 \times 5 \times 10^6$ .  
Give your answer in standard form.

..... [1]

DO NOT WRITE IN THIS MARGIN





20 Solve.

(a)  $x + 3 = 3$

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

(b)  $\frac{5y}{3} = 8$

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

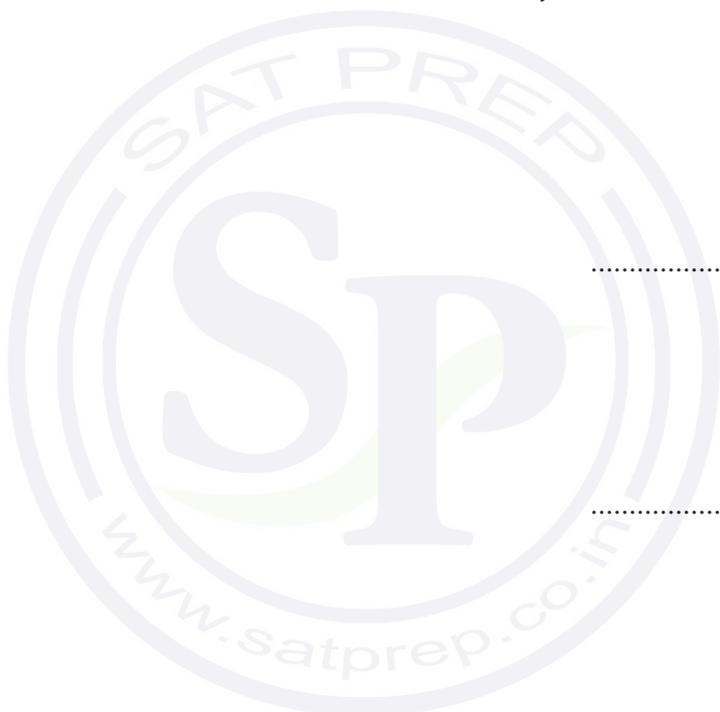
21 Simplify.

(a)  $(w^3)^{10}$

$\dots\dots\dots$  [1]

(b)  $t^6v^7 \times t^3v^{-2}$

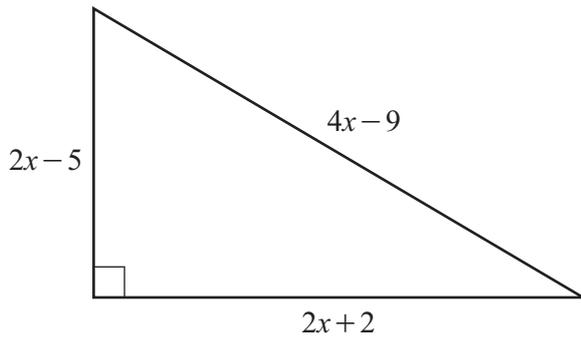
$\dots\dots\dots$  [2]



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22 In this question, all lengths are in centimetres.



NOT TO SCALE

The diagram shows a right-angled triangle.

- (a) Write down an expression, in terms of  $x$ , for the perimeter of the triangle. Give your answer in its simplest form.

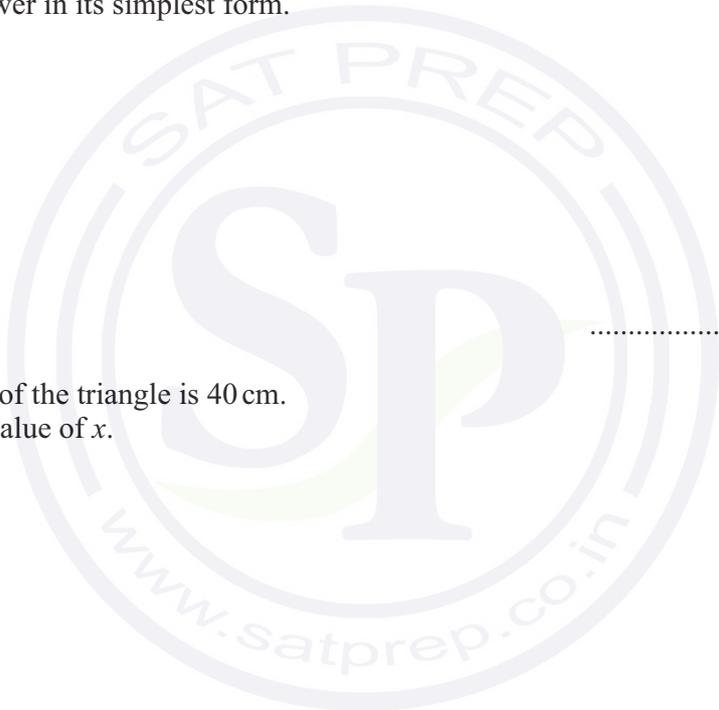
- (b) The perimeter of the triangle is 40 cm. Work out the value of  $x$ .

..... [2]

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

- (c) Work out the area of the triangle.

.....  $\text{cm}^2$  [3]

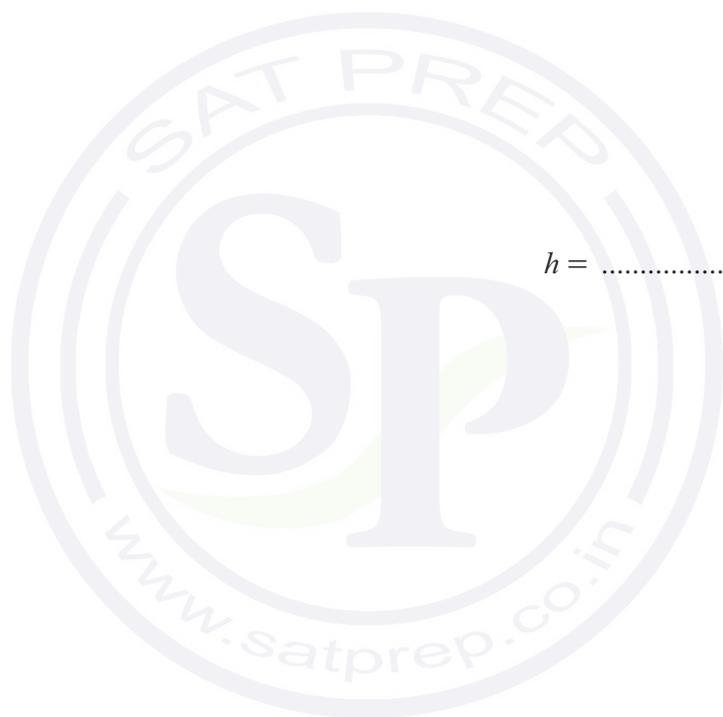




- 23 A sphere has radius 8 cm.  
A cone has radius 8 cm and height  $h$ .  
The sphere and the cone have the same volume.

Work out the height,  $h$ , of the cone.

$h = \dots\dots\dots$ cm [4]

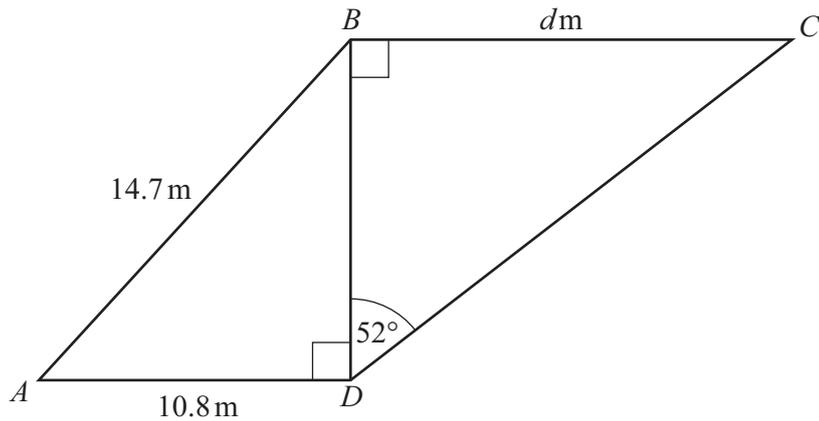


Question 24 is printed on the next page.





24 The diagram shows two right-angled triangles.



NOT TO SCALE

Calculate the value of  $d$ .



$d = \dots\dots\dots$  [5]

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# Cambridge IGCSE™

CANDIDATE NAME



CENTRE NUMBER

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CANDIDATE NUMBER

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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.
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- 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  $\pi$ , 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  $r$ .

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





1

- |   |   |    |    |    |    |    |    |
|---|---|----|----|----|----|----|----|
| 2 | 6 | 16 | 18 | 24 | 26 | 27 | 33 |
|---|---|----|----|----|----|----|----|

From this list, write down the number that is

(a) a multiple of 12

..... [1]

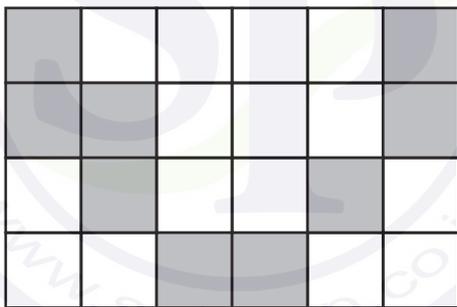
(b) a square number

..... [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.

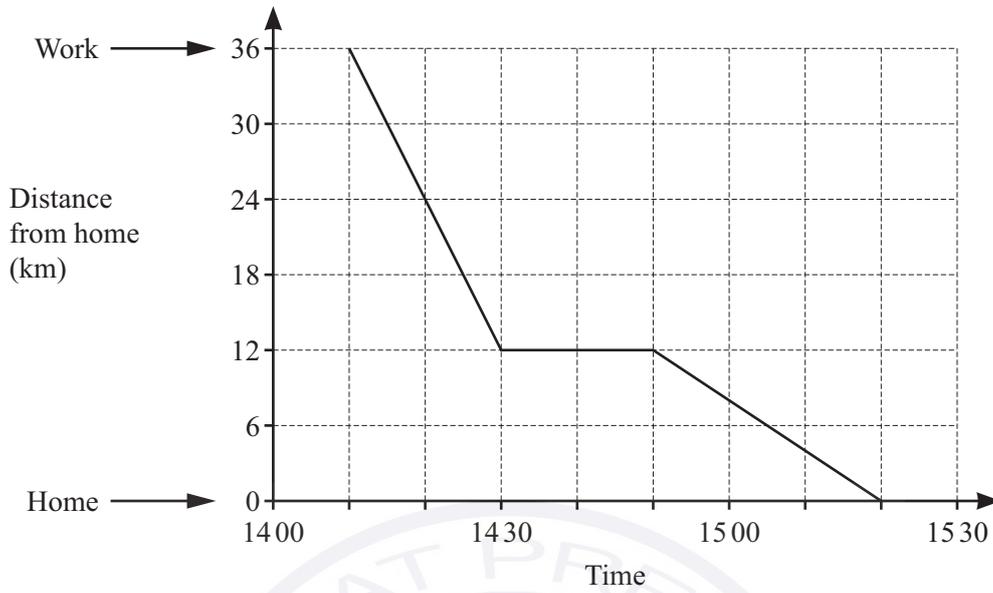
$80 \div 8 + 2 \times 3 = 24$
-------------------------------

[1]



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- 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]

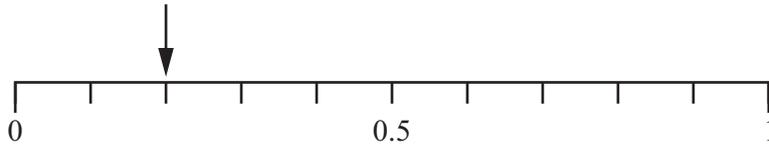




DO NOT WRITE IN THIS MARGIN

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.

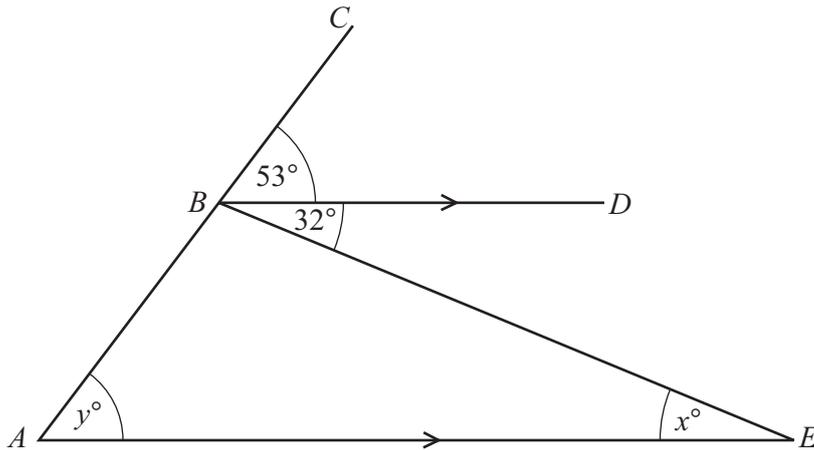
..... [1]

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

Calculate the amount Mia receives.

..... euros [1]





NOT TO SCALE

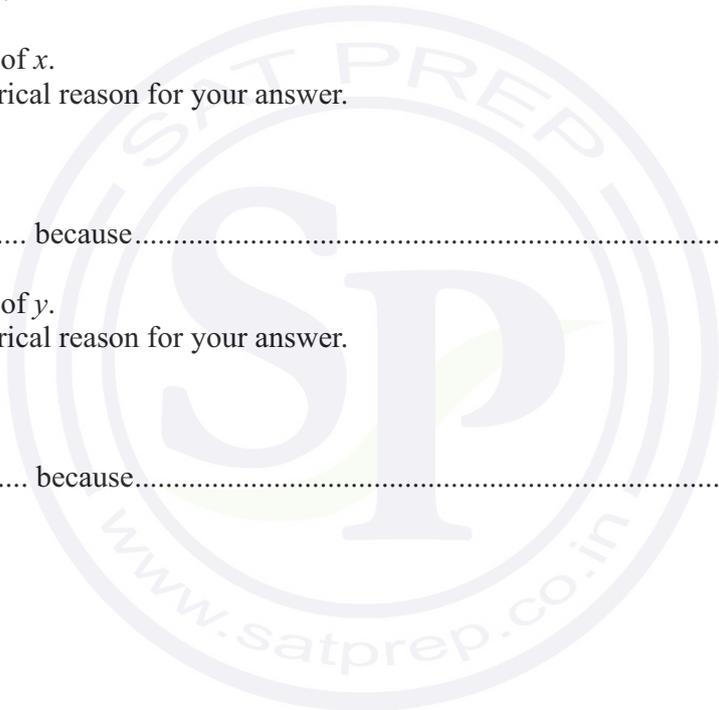
*ABC* is a straight line.  
*BD* is parallel to *AE*.

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

*x* = ..... because..... [2]

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

*y* = ..... because..... [2]





10 Solve.

$$4p + 11 = 25$$

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

11 (a) Expand and simplify.

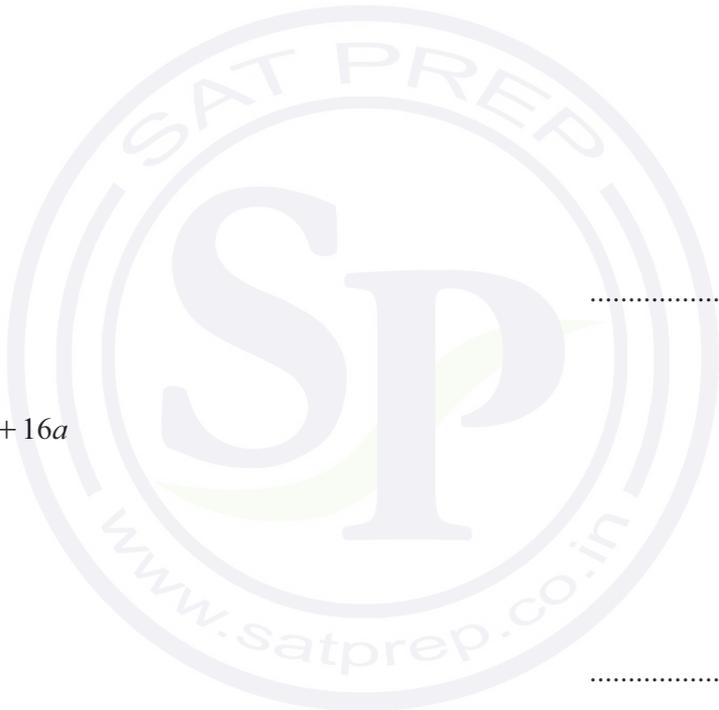
$$5(x - 2) + 3(x - 7)$$

$\dots\dots\dots [2]$

(b) Factorise.

$$4a^2 + 16a$$

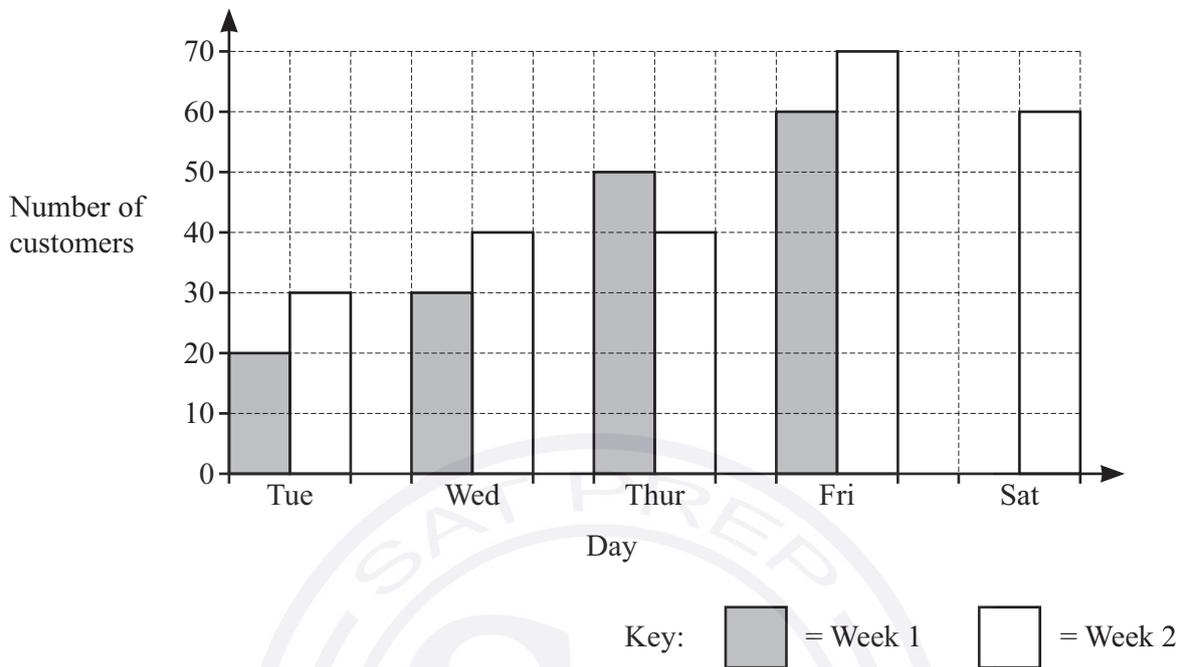
$\dots\dots\dots [2]$



DO NOT WRITE IN THIS MARGIN

- 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]





DO NOT WRITE IN THIS MARGIN

- 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.

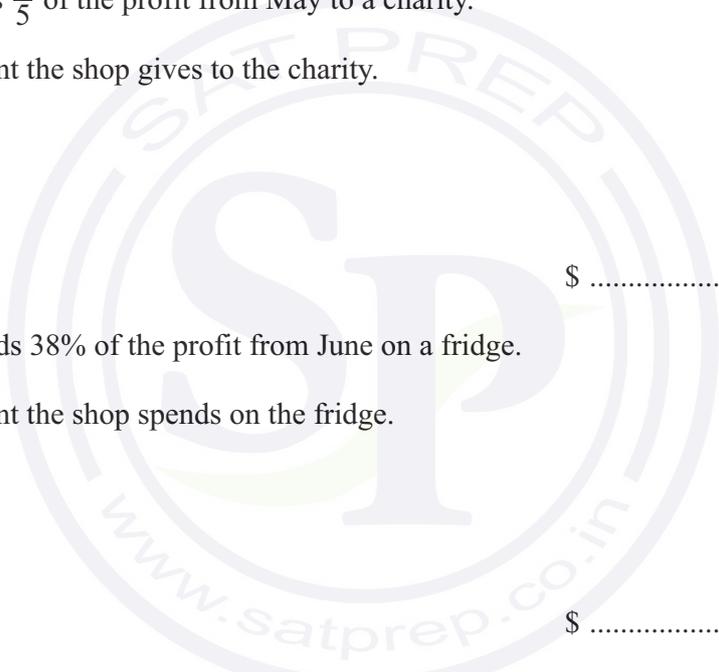
Find the amount the shop spends on the fridge.

\$ ..... [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.

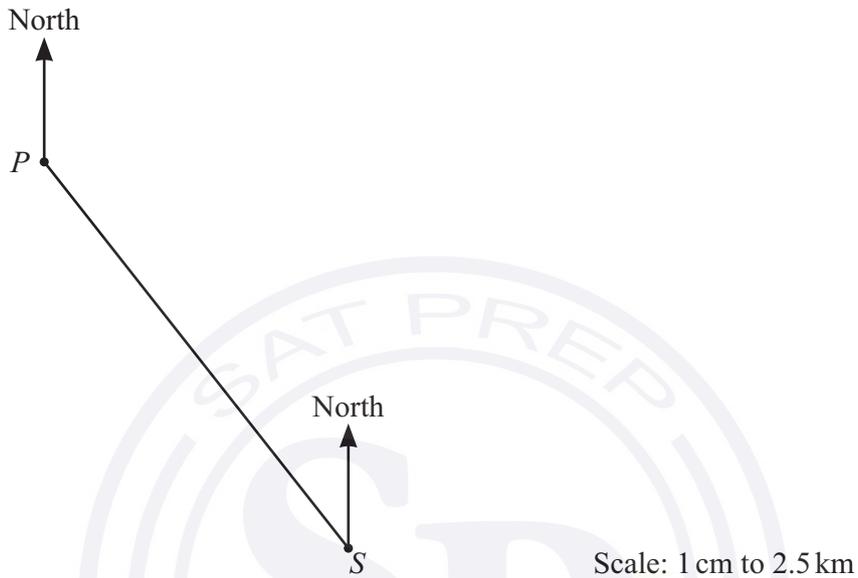
Find the value of  $d$ .

$d =$  ..... [3]





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



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

..... km [2]

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

..... [1]

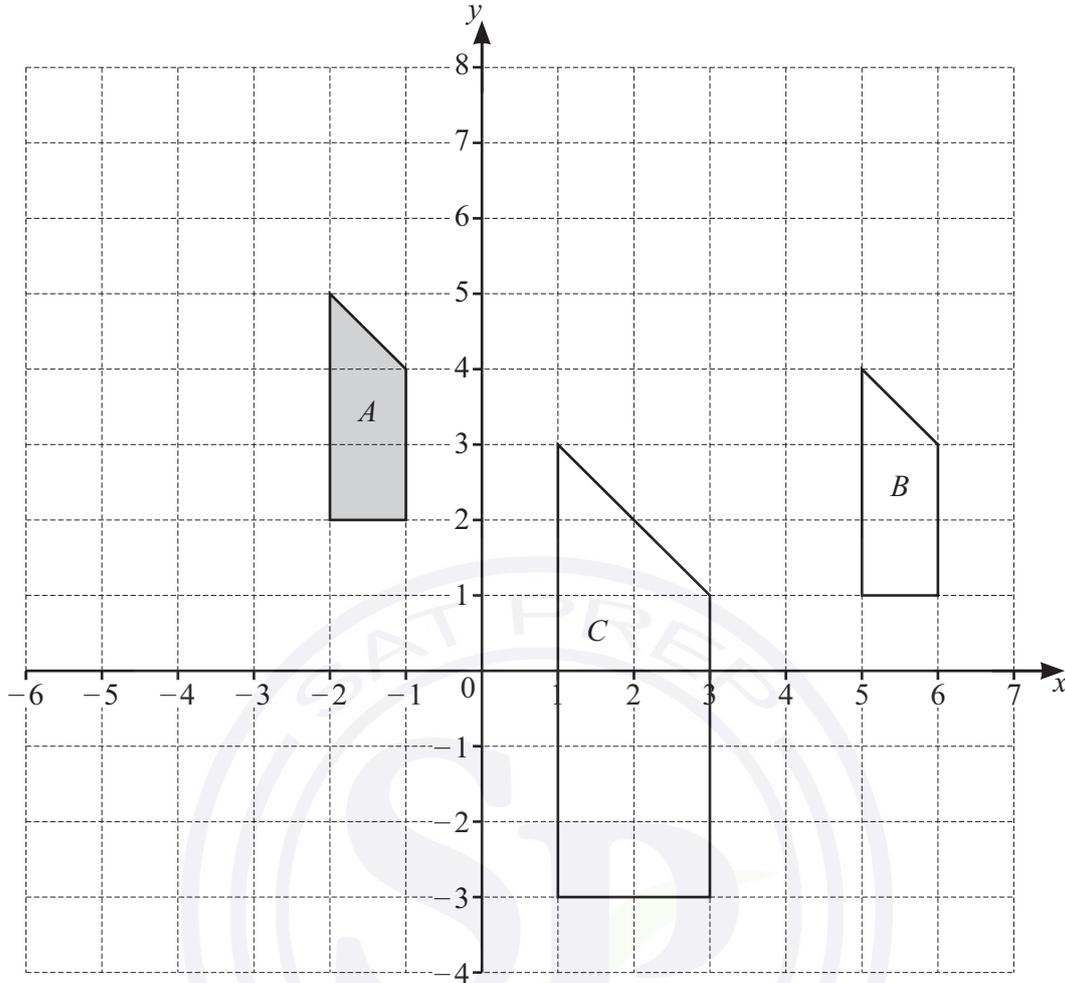
(c) *E* is 20 km from *P* on a bearing of  $070^\circ$ .

On the scale drawing, mark the position of *E*.

[2]



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- (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  $90^\circ$  anticlockwise about  $(0, 0)$ . [2]

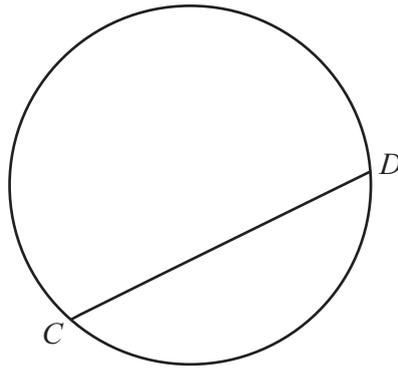
- (c) Describe fully the **single** transformation that maps shape *A* onto shape *C*.  
 .....  
 ..... [3]

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18 (a)

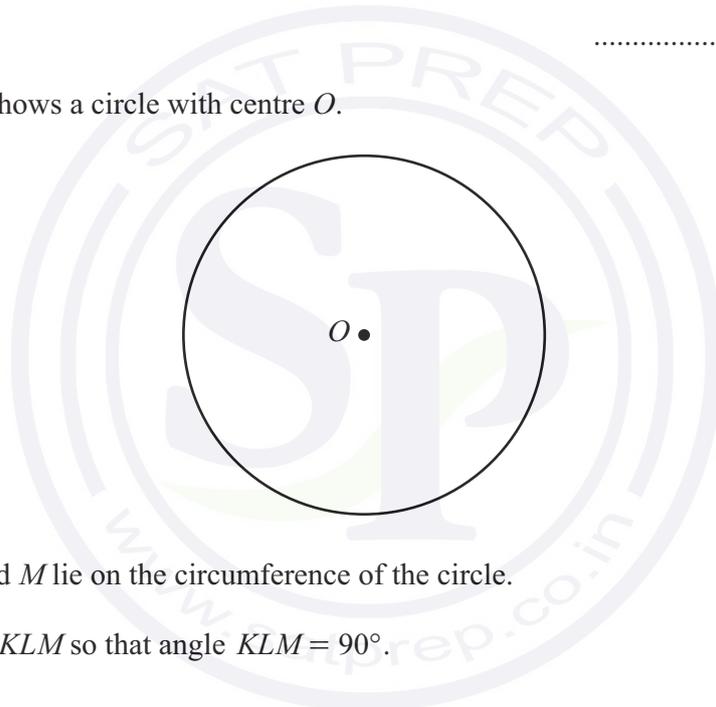


Points *C* and *D* lie on the circle.

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]



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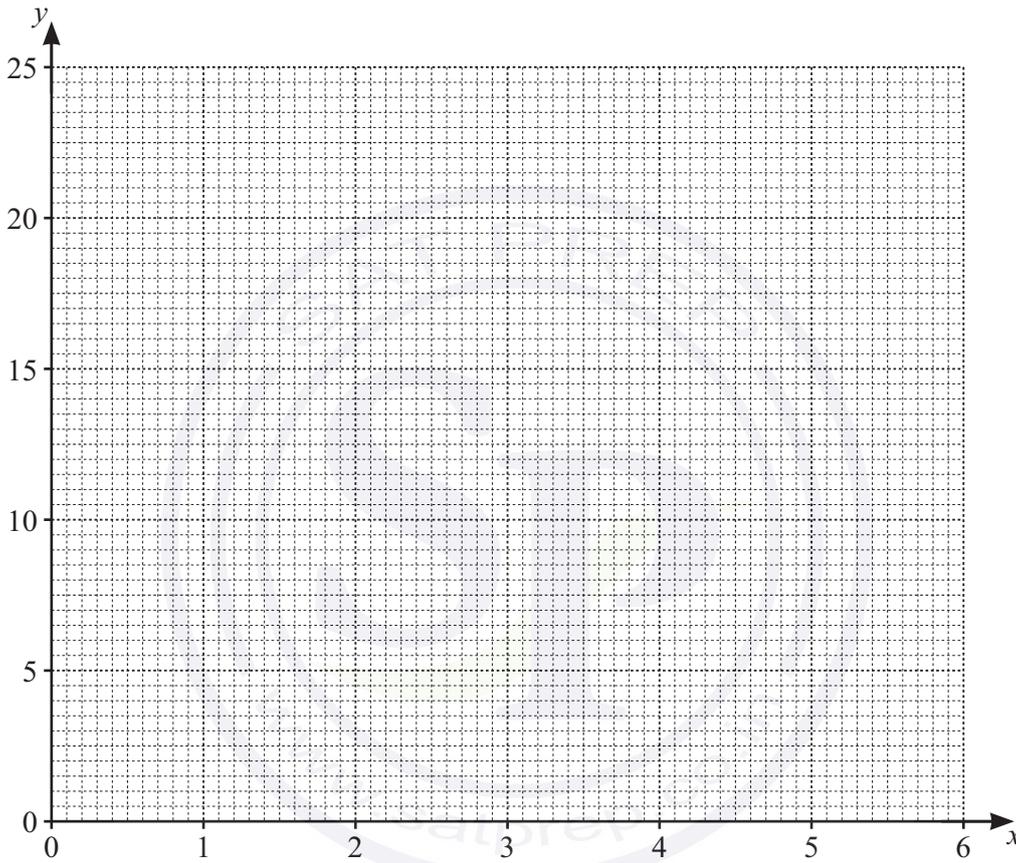


19 (a) Complete the table of values for  $y = \frac{20}{x}$ .

$x$	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

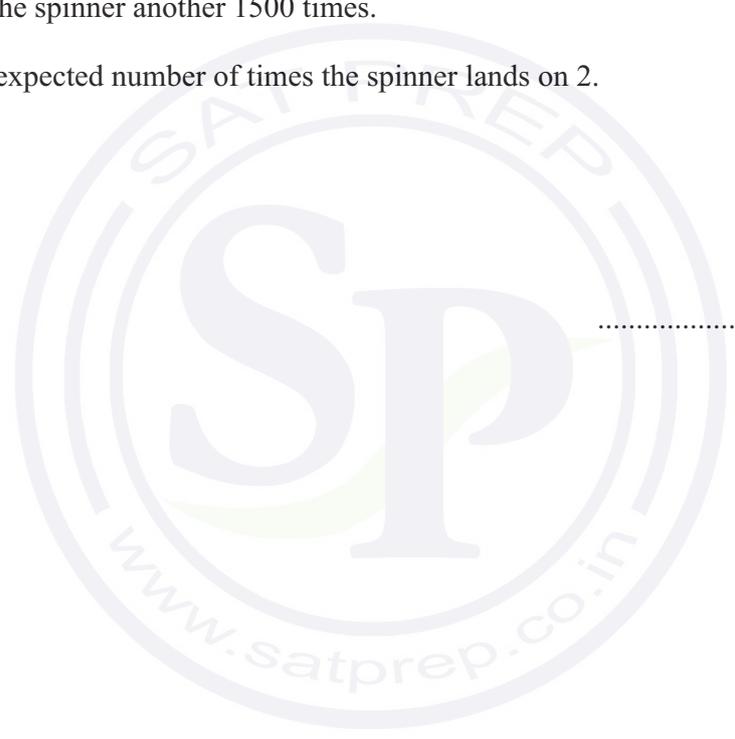
(a) Complete the table.

[2]

(b) Rinesh spins the spinner another 1500 times.

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

..... [1]



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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.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>
35 800	$7.8 \times 10^2$	$1.5 \times 10^6$	535	$2 \times 10^4$

(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.

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

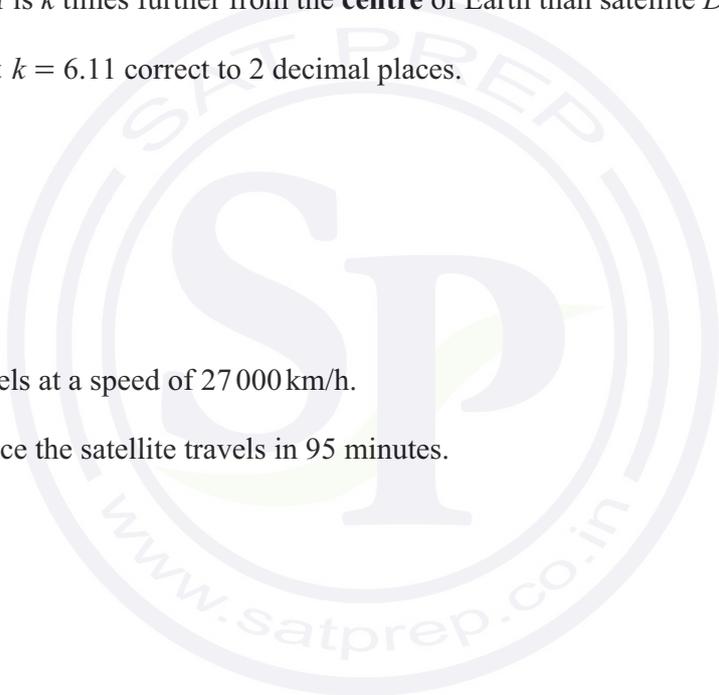
Find the distance the satellite travels in 95 minutes.

..... km [2]

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

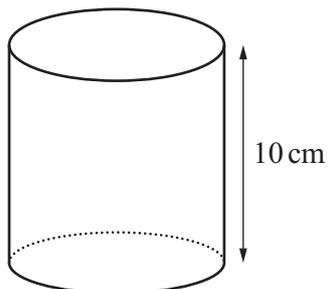
Convert this speed into m/s.

..... m/s [2]





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



NOT TO SCALE

The volume of the cylinder is  $478 \text{ cm}^3$ .

(a) Find the radius of the cylinder.

..... cm [3]

(b) The cylinder is made from gold.  
The density of the gold is  $19.3 \text{ g/cm}^3$ .

Calculate the mass of the cylinder.

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

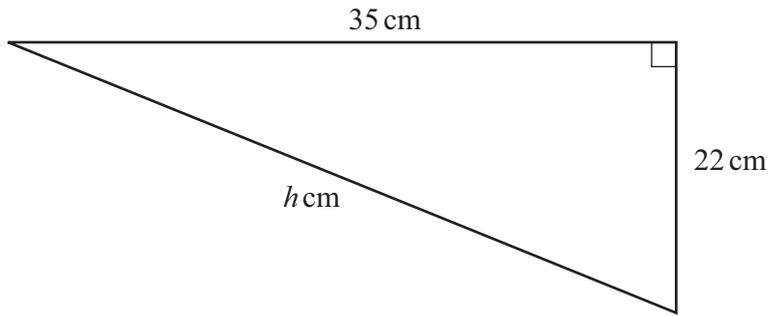
..... g [1]



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23 The diagram shows a right-angled triangle.

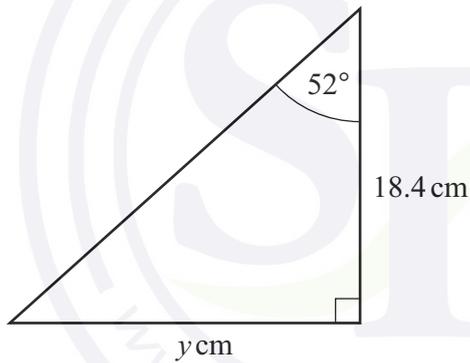


NOT TO SCALE

Calculate the value of  $h$ .

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

24 The diagram shows a right-angled triangle.



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Calculate the value of  $y$ .

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





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## MATHEMATICS

0580/32

Paper 3 Calculator (Core)

February/March 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  $\pi$ , 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 **16** 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  $r$ .  $V = \frac{4}{3}\pi r^3$





1 Taj is  $3\frac{1}{4}$  years old.

Work out her age in months.

..... months [1]

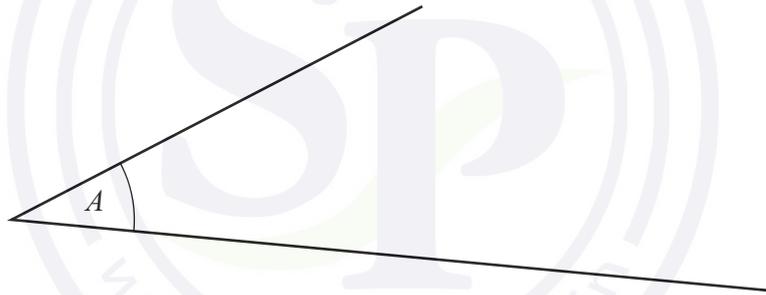
2 Div has \$25 to buy some cups which cost \$4.25 each.

Calculate the maximum number of cups he can buy and the change he receives.

Number of cups .....

Change \$ ..... [3]

3



(a) Measure angle *A*.

..... [1]

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

..... [1]



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4

- |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
|----|----|----|----|----|----|----|----|----|----|

From this list, write down the number that is

(a) a multiple of 13

..... [1]

(b) a factor of 140

..... [1]

(c) the largest prime number

..... [1]

(d) divisible by an even cube number

..... [1]

(e) 20% of 190.

..... [1]

5 (a) A farmer plants  $t$  trees each day.

Write an expression for the number of trees he plants in  $d$  days.

..... [1]

(b) A train has  $p$  passengers.

$x$  passengers get off the train and  $y$  passengers get on the train.

Write an expression for the number of passengers on the train now.

..... [1]



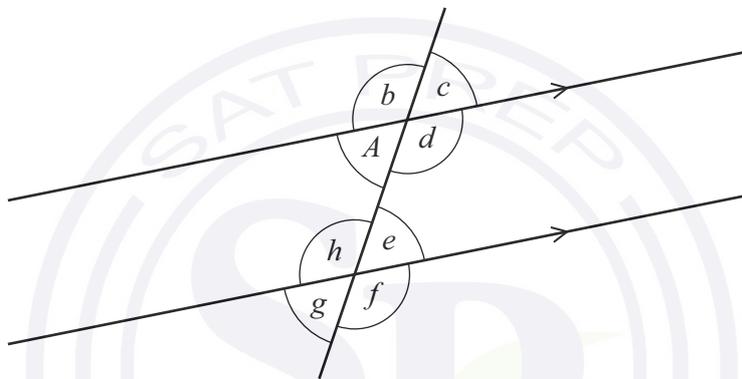


- 6 Raj thinks of a negative number,  $n$ .  
He adds 10 to  $n$  and then multiplies by 5.  
The answer is 30.

Work out the value of  $n$ .

$n = \dots\dots\dots$  [2]

- 7 The diagram shows a straight line crossing a pair of parallel lines.



Complete these statements.

- (a) Angle  $A$  and angle ..... are corresponding angles. [1]
- (b) Angle  $A$  and angle  $e$  are ..... angles. [1]



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8 These are the first four terms of a sequence.

31      24      17      10

(a) Write down the term-to-term rule for continuing this sequence.

..... [1]

(b) Find the next two terms in this sequence.

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

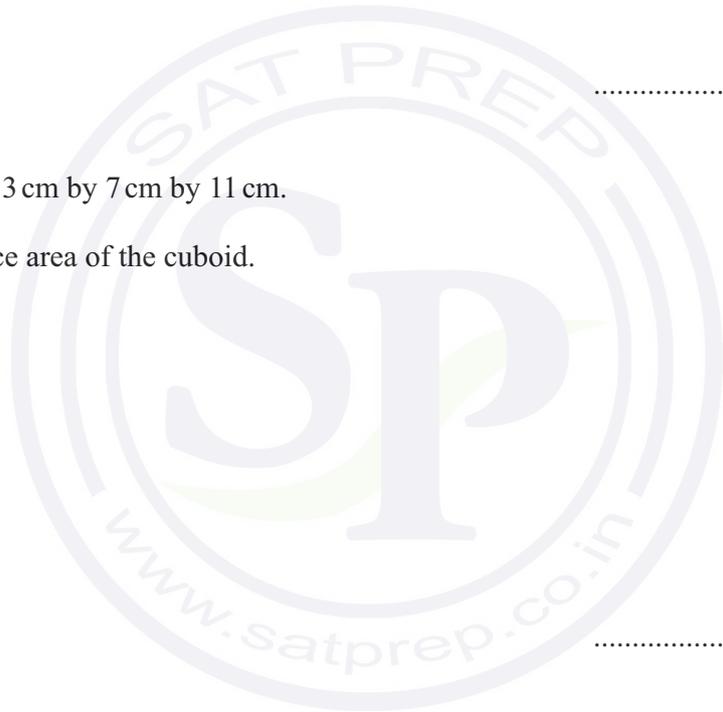
(c) Find the  $n$ th term.

..... [2]

9 A cuboid measures 3 cm by 7 cm by 11 cm.

Calculate the surface area of the cuboid.

.....  $\text{cm}^2$  [3]





10 The table shows an ordered stem-and-leaf diagram.  $A$ ,  $B$  and  $C$  are missing numbers.

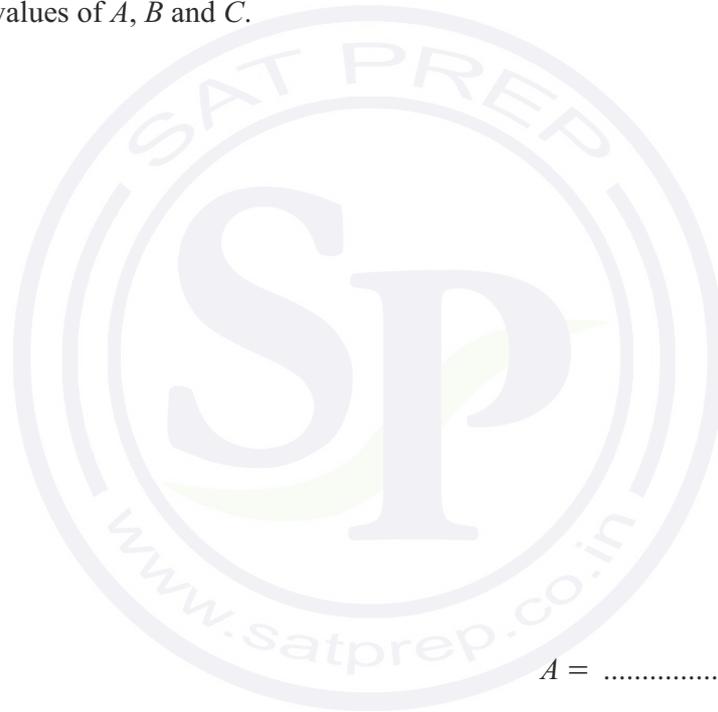
0	2 $A$
1	1 3 $B$ 7
2	0 4 6 $C$

Key : 1 | 3 represents 13

For the ten numbers

- the range is 27
- the median is 16
- the mean is 16.5 .

(a) Work out the values of  $A$ ,  $B$  and  $C$ .



$A$  = .....

$B$  = .....

$C$  = .....

[5]

(b) Complete this statement.

There is no mode because .....

..... [1]



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- 11 The scale drawing shows the positions of two lighthouses,  $P$  and  $Q$ .  
The scale is 1 centimetre represents 0.8 kilometres.



Scale: 1 cm to 0.8 km

- (a) (i) Find the actual distance between  $P$  and  $Q$ .

..... km [2]

- (ii) Measure the bearing of  $Q$  from  $P$ .

..... [1]

- (b) A boat,  $B$ , is on a bearing of  $127^\circ$  from  $P$ .

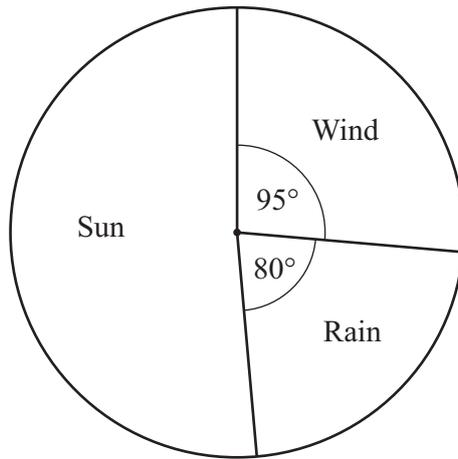
Calculate the bearing of  $P$  from  $B$ .

..... [2]





- 12 Mo asks some people if they prefer sun, rain or wind.  
The pie chart shows the results.



45 more people prefer wind than rain.

Work out how many people prefer sun.

..... [4]

- 13 Xie changes 2000 dollars into krona.

1 dollar = 0.615 euros  
1 krona = 0.087 euros

Use the exchange rates to calculate how many krona she receives.  
Give your answer correct to the nearest krona.

..... krona [3]



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14 (a) Factorise.

$$8x^2 - 2x$$

..... [2]

(b) Expand the brackets and simplify.

$$5(2m - 1) + 3(m + 7)$$

..... [2]

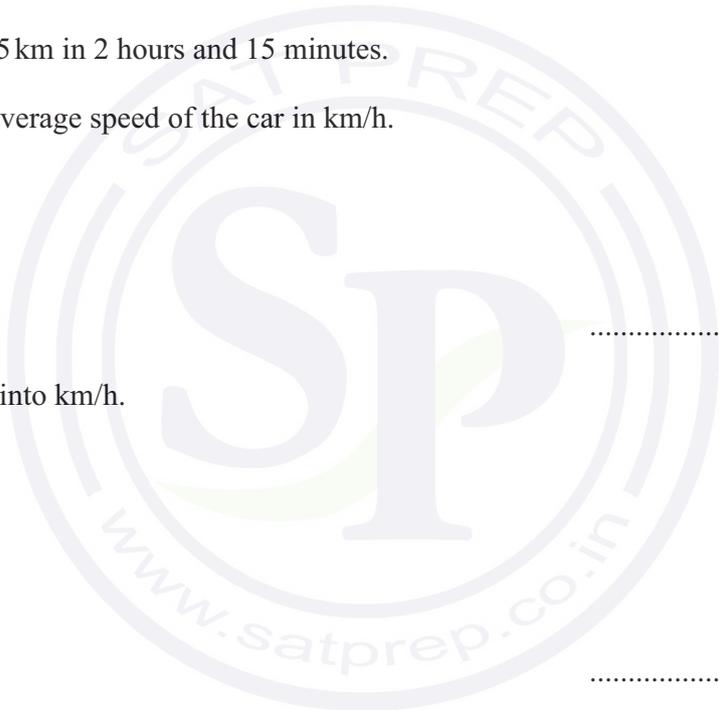
15 (a) A car travels 95 km in 2 hours and 15 minutes.

Calculate the average speed of the car in km/h.

..... km/h [1]

(b) Convert 8 m/s into km/h.

..... km/h [2]



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16 (a) Chi shares \$480 in the ratio 2 : 3 : 7.

Calculate the value of the largest share.

\$ ..... [2]

(b) Simplify these ratios.

(i) 98 : 147

..... : ..... [1]

(ii)  $2^{450} : 2^{452}$

..... : ..... [1]

17 (a) Solve.

$$\frac{x}{3} = 18$$

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

(b)  $\frac{6^9}{6^y} = 6^{11}$

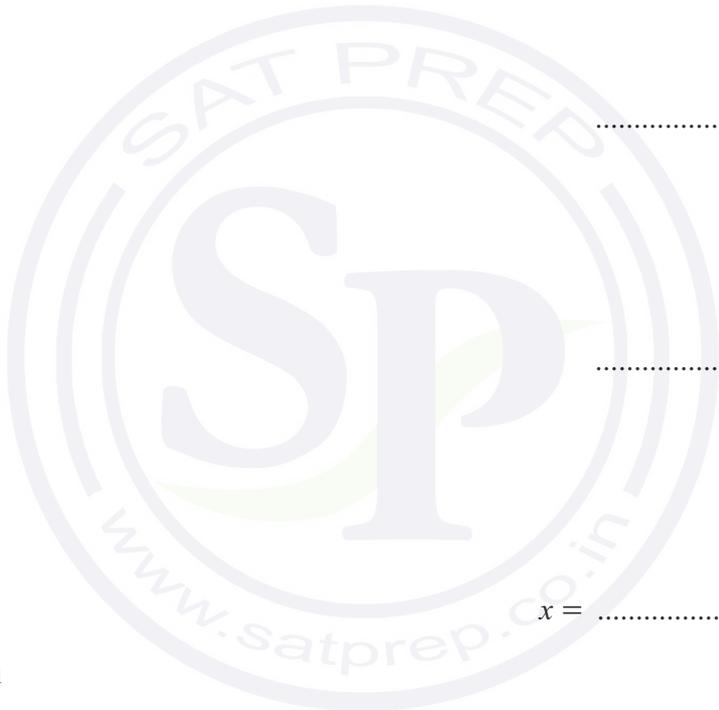
Find the value of  $y$ .

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

(c) Simplify.

$$\frac{a^6 b^{-2}}{a^4 b^3}$$

..... [2]



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18 (a) Clare invests \$12 000 for 3 years at a rate of 8% per year compound interest.

Calculate the value of her investment at the end of the 3 years.  
Give your answer correct to the nearest \$10.

\$ ..... [3]

(b) Zak invests \$560 for one year.  
After one year his investment is worth \$630.

Calculate the percentage increase.

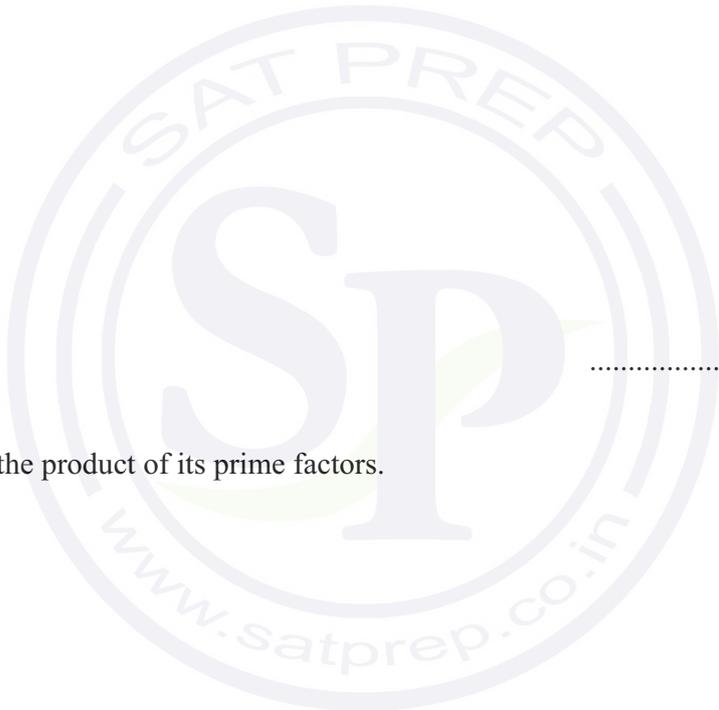
.....% [2]

19 (a) Write 2025 as the product of its prime factors.

..... [2]

(b) Write 2025 as a product of two square numbers that are both greater than one.

..... [1]

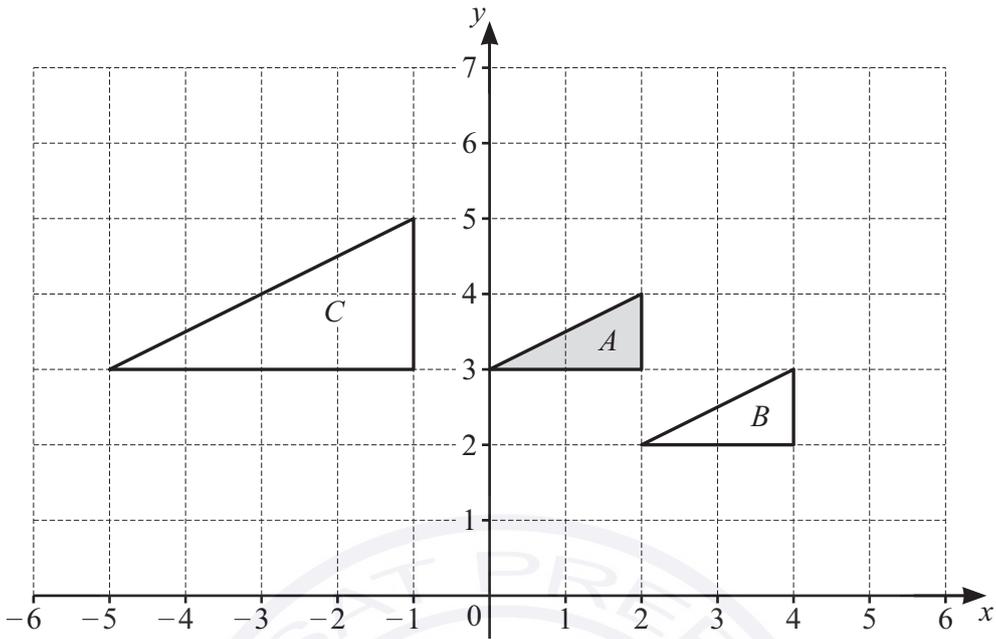


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20 The diagram shows three shapes, *A*, *B* and *C*, on a 1 cm<sup>2</sup> grid.



(a) On the grid, draw the image of shape *A* after a rotation, 90° clockwise, centre (0, 3). [2]

(b) Describe fully the **single** transformation that maps

(i) shape *A* onto shape *B*

.....  
 ..... [2]

(ii) shape *A* onto shape *C*.

.....  
 ..... [3]

(c) Calculate the size of the smallest angle in triangle *C*.

..... [2]



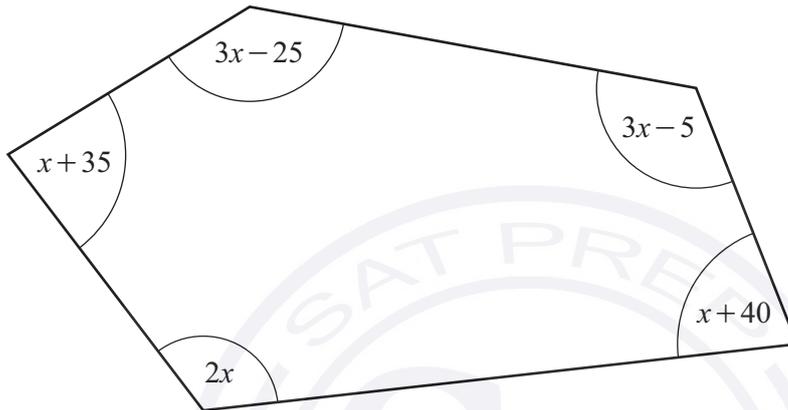
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21 (a) Show that the sum of the interior angles of a pentagon is  $540^\circ$ .

[1]

(b) In this part, all angles are in degrees.



NOT TO SCALE

The diagram shows the five interior angles of a pentagon, written in terms of  $x$ .

(i) Write down an expression, in terms of  $x$ , for the sum of the interior angles of the pentagon. Give your answer in its simplest form.

..... [2]

(ii) Work out the value of  $x$ .

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





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