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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 π , use either your calculator value or 3.142.

INFORMATION

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

This document has **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 .

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

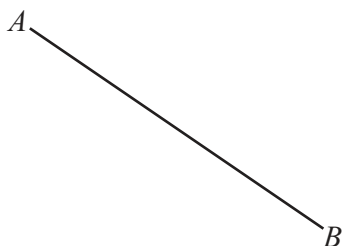
Volume, V , of sphere of radius r .

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





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 $\times$ 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]





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×-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
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Find

(a) the mode

..... [1]

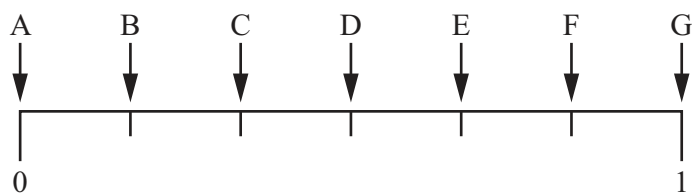
(b) the range.

..... [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.

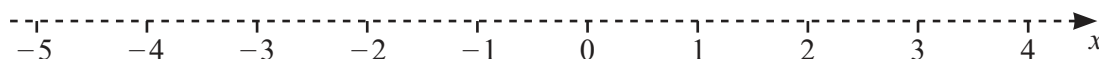
- (a) $8x = 32$

$x =$ [1]

- (b) $6x - 3 = 12$

$x =$ [2]

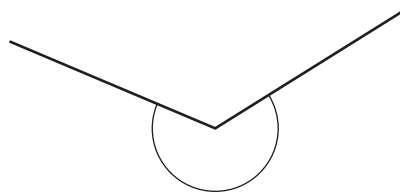
- (c) Represent the inequality $-4 \leq x < 2$ on the number line.



[2]



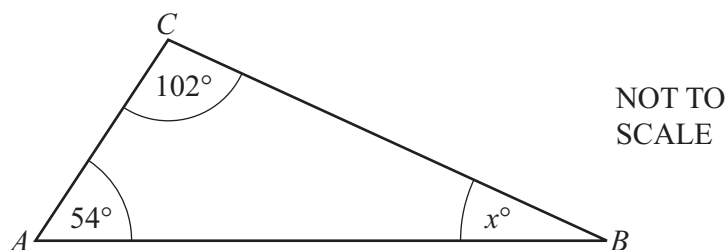
9 (a)



Write down the mathematical name for this type of angle.

..... [1]

(b) ABC is a triangle.

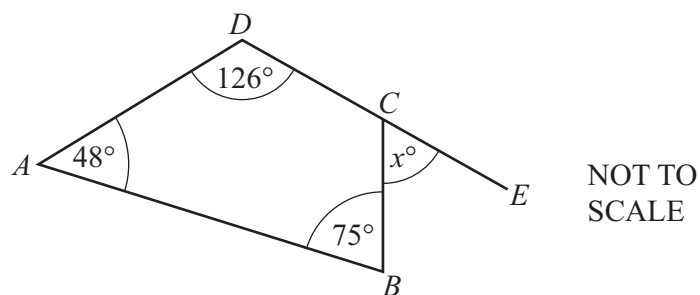


Lily says x is 34.

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]



- 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]

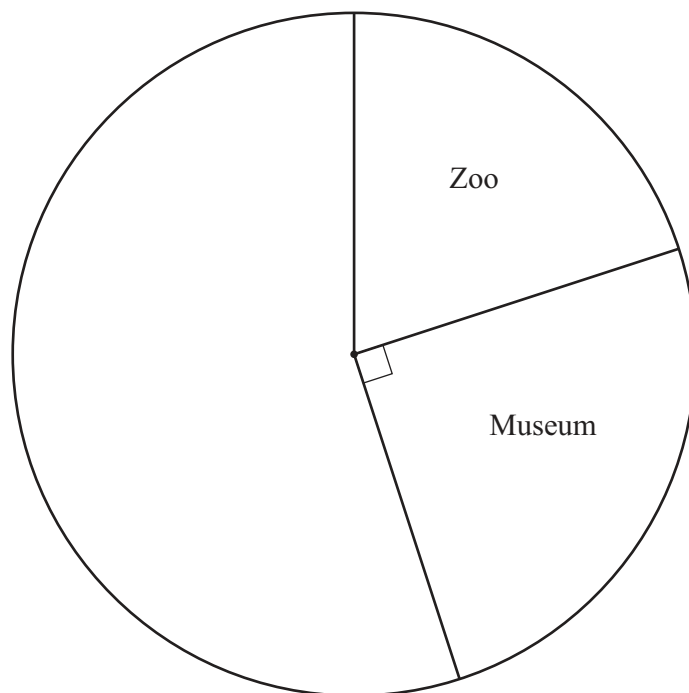
- (b) Li pays \$1400 to hire a car.
\$364 of this is insurance.

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.

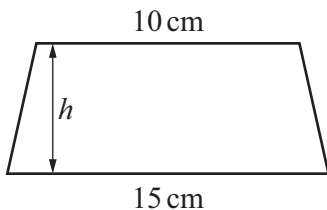
[2]



- 13 (a) The surface area of a solid cube is 121.5 cm^2 .

Calculate the length of the side of the cube.

(b)



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..... cm [3]

The area of the trapezium is 106.25 cm^2 .

- (i) Calculate the height of the trapezium.

..... cm [2]

- (ii) Convert 106.25 cm^2 into m^2 .

..... 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 .

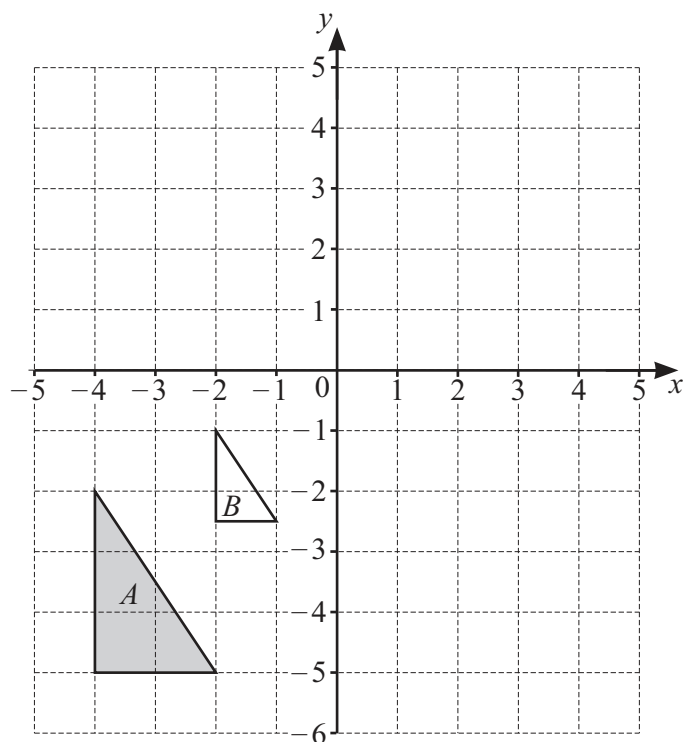
Complete the table.

Colour	red	yellow	blue	green
Probability	0.53	0.19		

[3]



15 Shapes A and B are shown on the grid.



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

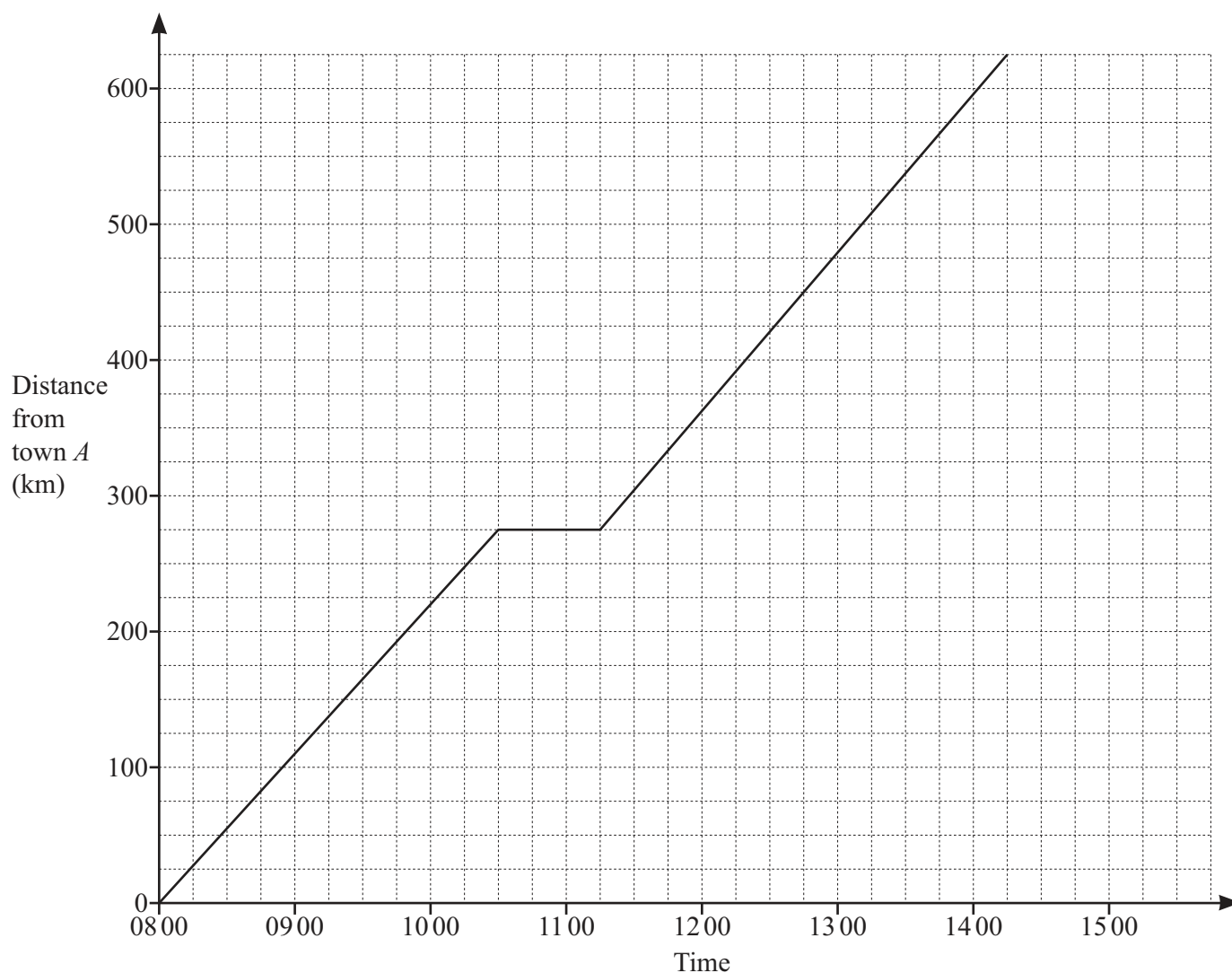
.....
 [3]

(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]



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.

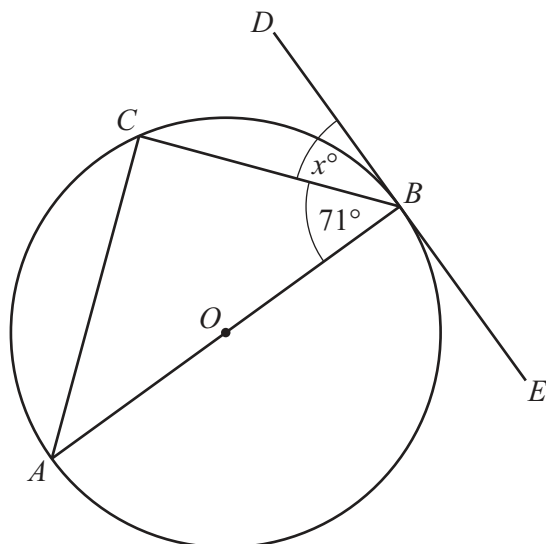
\$ [3]



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

..... [2]

(b)



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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 .

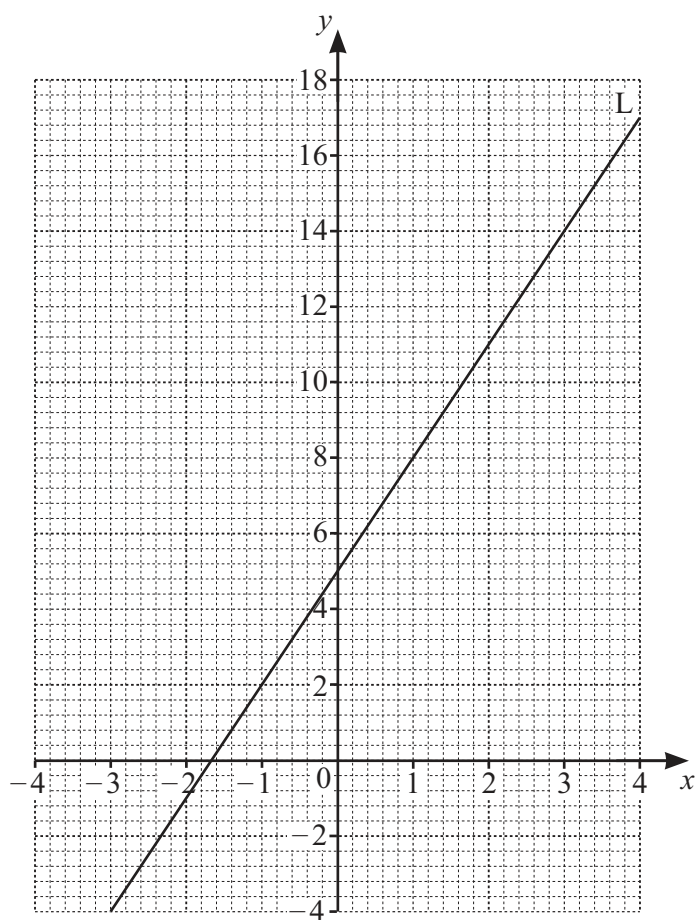
Find the value of x .
 Give a geometrical reason for your answer.

..... 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]



- 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]

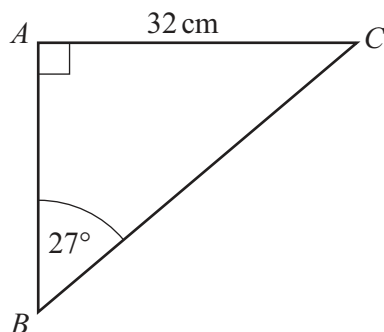
- 23 Calculate $\frac{4.6 \times 10^3}{1.84 \times 10^5}$.

Give your answer in standard form.

..... [2]

Question 24 is printed on the next page





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ABC is a right-angled triangle.

Calculate BC .

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

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