



# Cambridge IGCSE™

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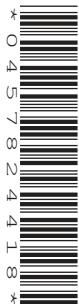
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**MATHEMATICS**

**0580/33**

Paper 3 (Core)

**October/November 2021**

**2 hours**

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  $\pi$ , use either your calculator value or 3.142.

## INFORMATION

- The total mark for this paper is 104.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages. Any blank pages are indicated.

1 Roberto and his family fly from London to Los Angeles on a holiday.

(a) The flight takes 11 hours 15 minutes.

- (i) The flight leaves London at 15 40 local time.  
The local time in Los Angeles is 8 hours behind the local time in London.

Work out the local time in Los Angeles that the plane arrives.

..... [2]

(ii) The plane flies a total of 8760 km.

Calculate the average speed of the plane.

..... km/h [3]

(b) Roberto hires a car.

- (i) The cost of hiring a car is \$56 per day, plus a fixed cost of \$436.

Write down a formula for the cost,  $C$  dollars, of hiring a car for  $d$  days.

..... [2]

- (ii) Roberto is given a car at random.  
There are four colours of car.

|             |      |        |       |       |
|-------------|------|--------|-------|-------|
| Colour      | Red  | Silver | Black | White |
| Probability | 0.17 | 0.24   |       | 0.3   |

Complete the table. [2]

(c) The family visit a national park which has an area of 4986 km<sup>2</sup>.

- (i) Write 4986 correct to the nearest hundred.

..... [1]

(ii) Write 4986 in standard form.

..... [1]

- (d) A ticket for the park costs \$17.50 plus 8% tax.

Calculate the amount of tax paid.

\$ ..... [1]

- (e) The scale drawing shows the positions of two viewing points, *A* and *B*, in the park.  
The scale is 1 centimetre represents 5 kilometres.



Scale : 1 cm to 5 km

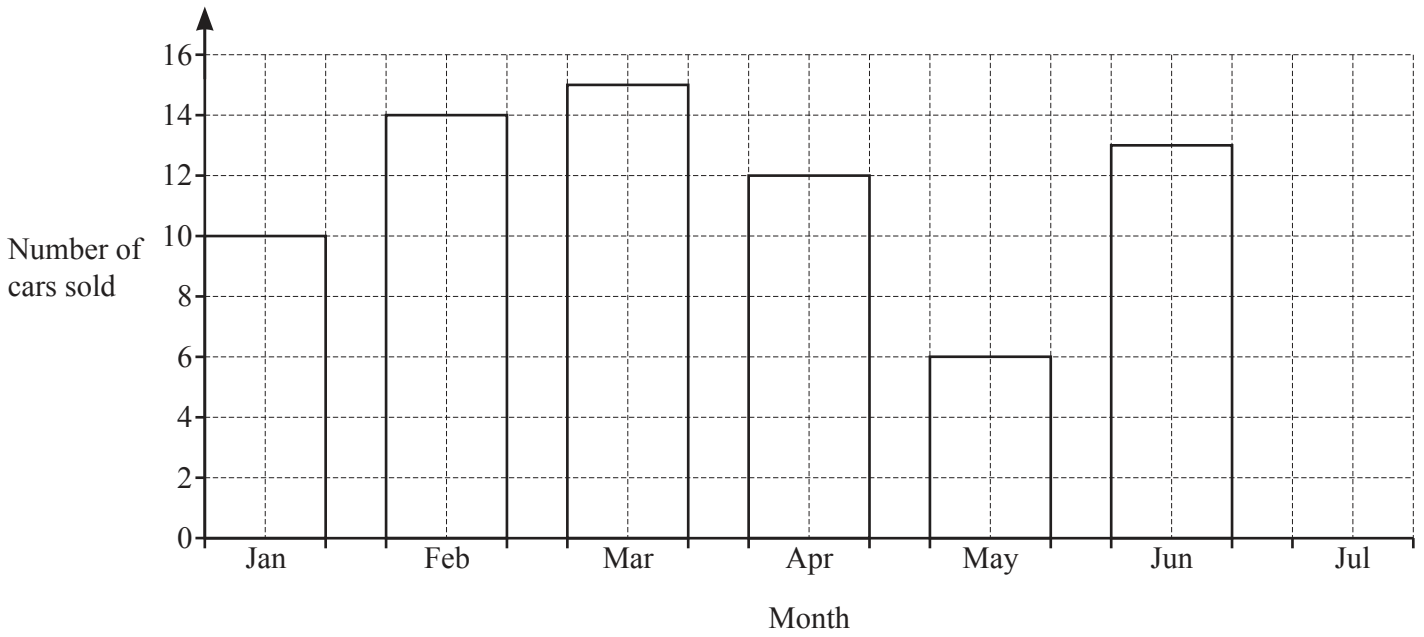
- (i) Work out the actual distance between point *A* and point *B*.

..... km [2]

- (ii) Point *C* is 20 km from point *A* on a bearing of  $072^\circ$ .

On the scale drawing mark the position of point *C*. [2]

2 (a) The bar chart shows the number of cars sold by a garage in each of six months.



(i) In July, 11 cars were sold.

Complete the bar chart.

[1]

(ii) How many more cars were sold in March than in May?

..... [1]

(b) These are the opening times of the garage.

|                  |                    |
|------------------|--------------------|
| Monday to Friday | 8.30 am to 5.30 pm |
| Saturday         | 8.30 am to 1.00 pm |
| Sunday           | Closed             |

Work out how many hours the garage is open in one week.

..... h [2]

- (c) Mohammed works at the garage.  
He works for 36 hours from Monday to Friday and for 2 hours on Saturday.

He is paid \$10.50 per hour from Monday to Friday.

On Saturday he is paid  $1\frac{1}{2}$  times this rate.

Calculate how much Mohammed is paid for this week.

\$ ..... [3]

- (d) Viktor is saving to buy a car.  
He invests \$8000 for 5 years at a rate of 2.4% per year compound interest.

Calculate the value of Viktor's investment at the end of the 5 years.

Give your answer correct to the nearest dollar.

\$ ..... [3]

- (e) At the garage, Pierre, Luigi and Freda sell cars.  
They share a bonus of \$12 000 in the ratio Pierre : Luigi : Freda = 8 : 4 : 3.

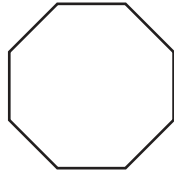
Calculate the amount they each receive.

Pierre \$ .....

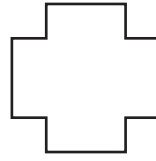
Luigi \$ .....

Freda \$ ..... [3]

- 3 (a) Write down the order of rotational symmetry of each shape.



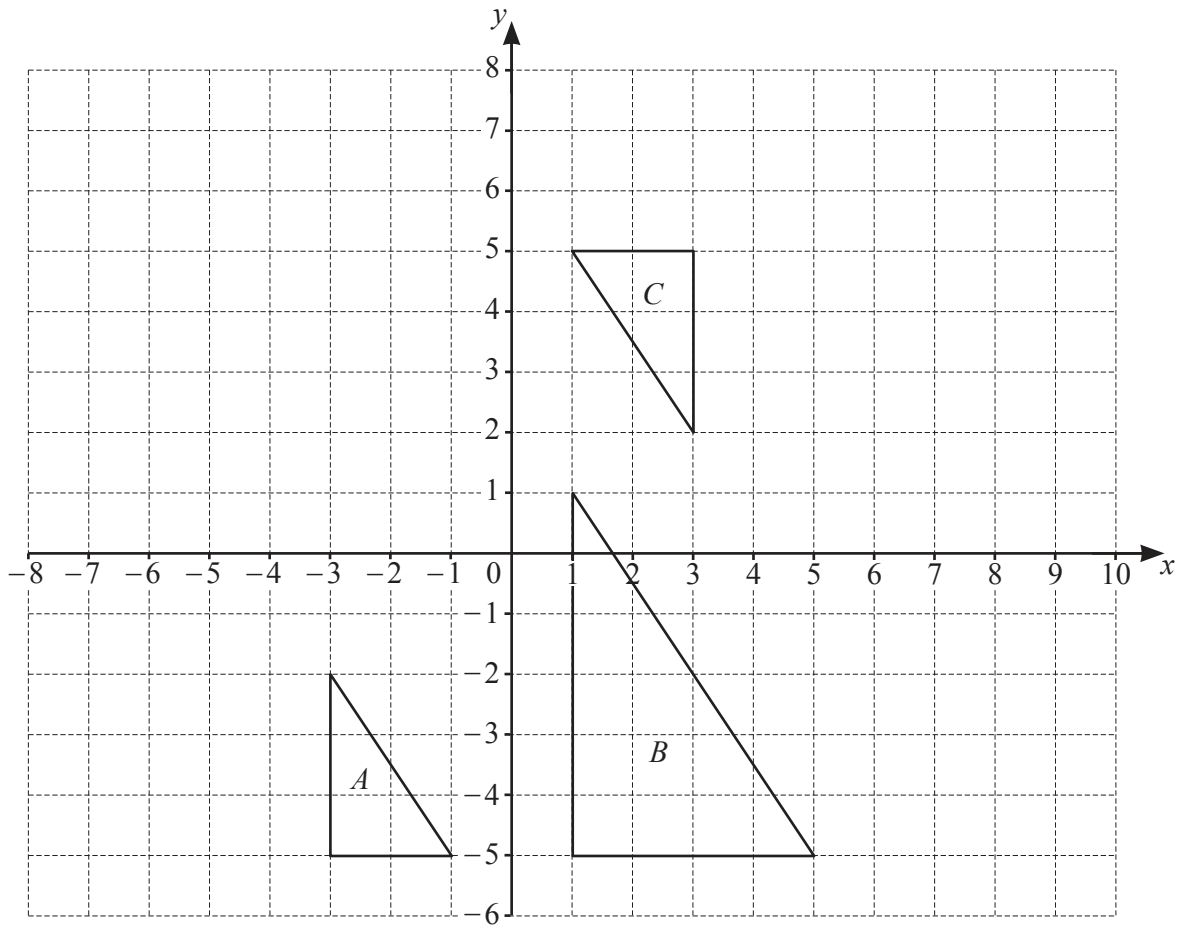
.....



.....

[2]

- (b) Triangles  $A$ ,  $B$  and  $C$  are shown on the grid.



- (i) Describe fully the **single** transformation that maps

- (a) triangle  $A$  onto triangle  $B$ ,

.....  
 .....

[3]

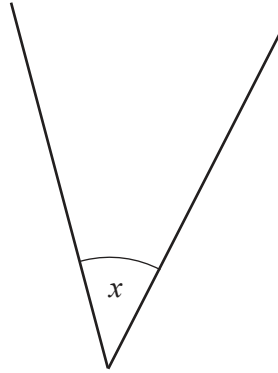
- (b) triangle  $A$  onto triangle  $C$ .

.....  
 .....

[3]

- (ii) On the grid, reflect triangle  $C$  in the line  $x = -1$ . [2]
- (iii) On the grid, translate triangle  $C$  by the vector  $\begin{pmatrix} 5 \\ -1 \end{pmatrix}$ . [2]

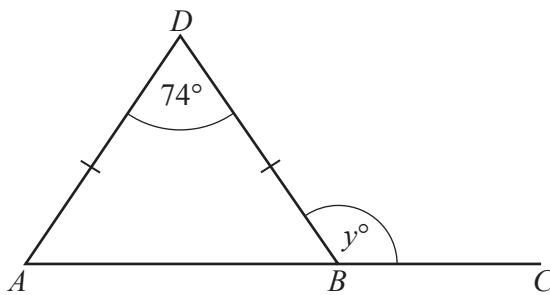
4 (a)

(i) Measure the size of angle  $x$ .Angle  $x = \dots\dots\dots$  [1]

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

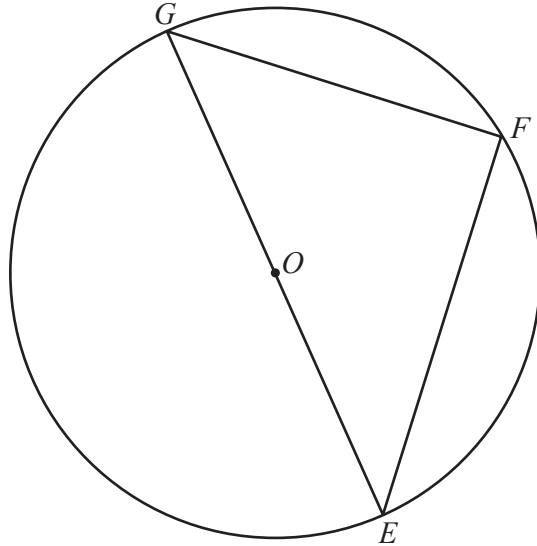
 $\dots\dots\dots$  [1]

(b)

NOT TO  
SCALE $ABC$  is a straight line and  $ABD$  is an isosceles triangle.Find the value of  $y$ . $y = \dots\dots\dots$  [3]



(c)

NOT TO  
SCALE

$E$ ,  $F$  and  $G$  are points on the circle, centre  $O$ .  
 $EG = 12$  cm.

(i) Write down the mathematical name for the line  $FG$ .

..... [1]

(ii) Explain why angle  $EFG$  is  $90^\circ$ .

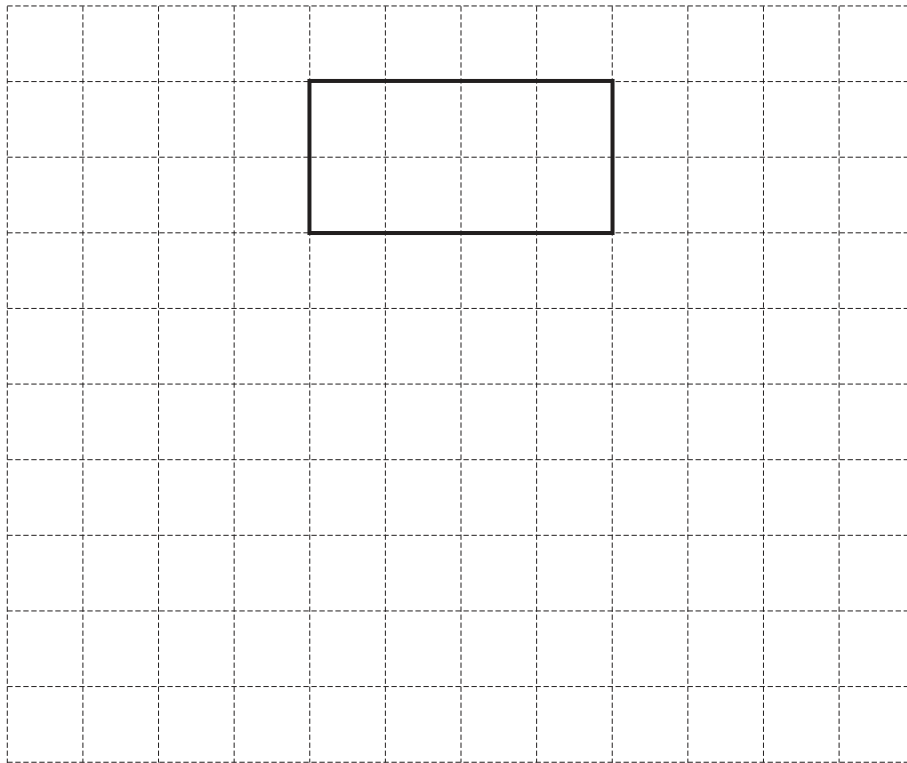
..... [1]

(iii) Calculate the area of the circle.

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

5 (a) A cuboid measures 4 cm by 2 cm by 2 cm.

(i) On the 1 cm<sup>2</sup> grid, draw an accurate net of this cuboid.  
One face has been drawn for you.



[3]

(ii) Calculate the surface area of the cuboid.

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

(iii) A factory makes 5000 of these cuboids.  
25 of the cuboids are checked and 3 of these cuboids are faulty.

How many of the 5000 cuboids are expected to be faulty?

..... [2]

- (b) The surface area of a cube is  $294 \text{ cm}^2$ .

Calculate the volume of the cube.

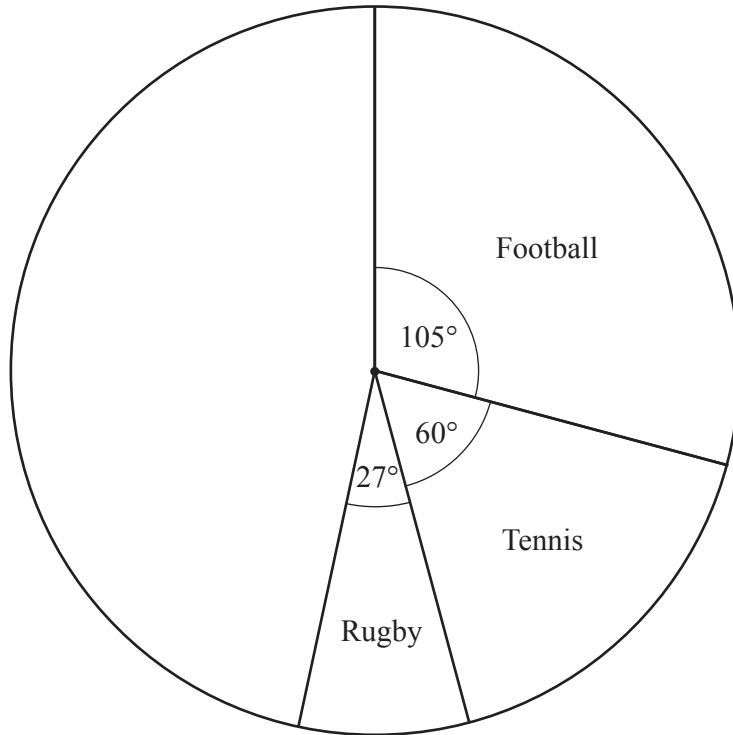
.....  $\text{cm}^3$  [3]

- (c) The length,  $l \text{ cm}$ , of a line is measured as  $24 \text{ cm}$ , correct to the nearest centimetre.

Complete the statement about the value of  $l$ .

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

- 6 (a) Jean asks 600 people to choose their favourite sport. The pie chart shows some of this information.



- (i) Show that 100 people choose tennis.

[1]

- (ii) Work out how many people choose rugby.

..... [2]

- (iii) 125 people choose cricket and the rest choose swimming.

Complete the pie chart to show this information.

[2]

- (iv) One of the 600 people is picked at random.

Find the probability that this person chooses tennis or cricket.  
Give your answer as a fraction in its simplest form.

..... [2]

(b) There are 80 people in a group.

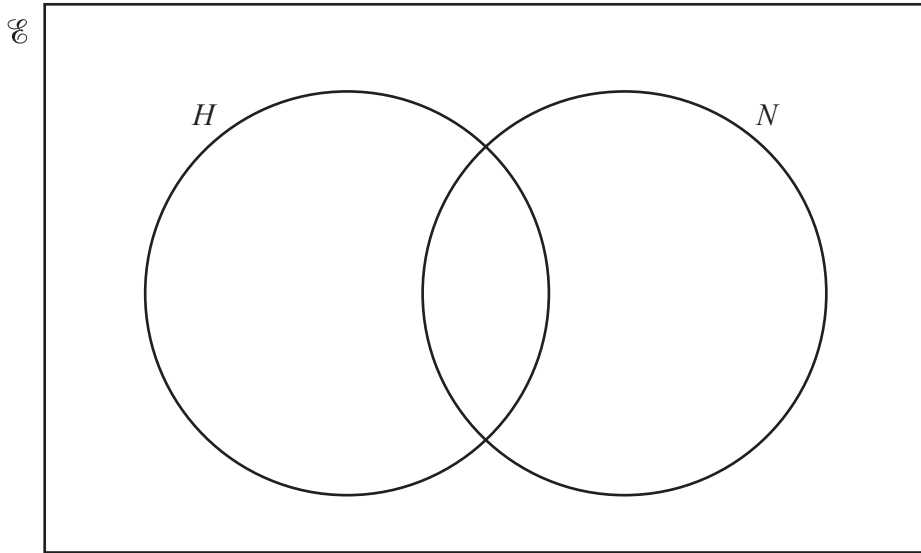
$H = \{\text{people who play hockey}\}$

$N = \{\text{people who play netball}\}$

36 people play hockey.

53 people play netball.

8 people do not play hockey or netball.



Complete the Venn diagram.

[3]

- 7 (a) Write the number six hundred and three thousand eight hundred and twenty-one in figures.

..... [1]

- (b) Pens cost 47 cents each.  
Aroha buys 8 pens.

How much change does she receive from \$5?

\$ ..... [2]

- (c) Find the value of

(i)  $\sqrt{81}$ ,

..... [1]

(ii)  $6^3$ ,

..... [1]

(iii)  $3^0$ .

..... [1]

- (d) Write 130 as a product of its prime factors.

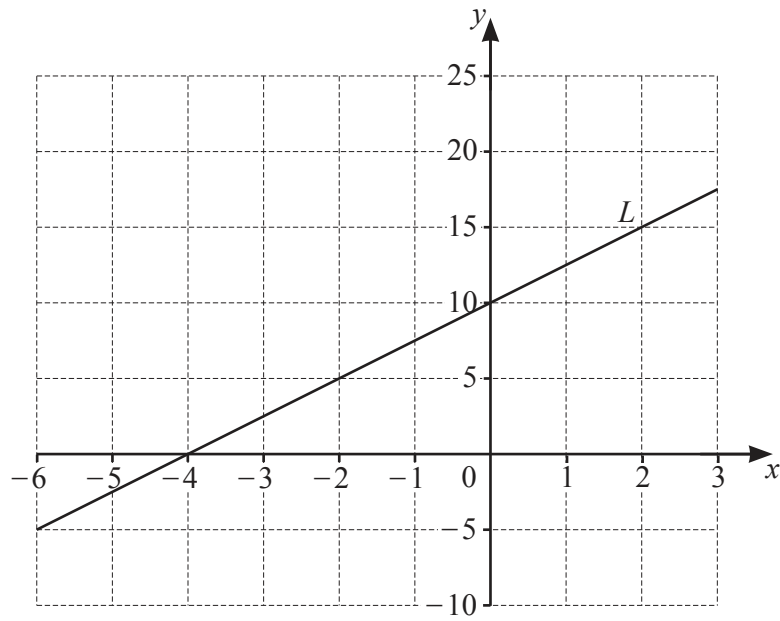
..... [2]

- (e) A tower has two bells, *A* and *B*.  
Bell *A* rings every 12 minutes.  
Bell *B* rings every 14 minutes.  
Both bells ring at 09 30.

Find the next time both bells ring together.

..... [3]

- 8 (a) Line  $L$  is shown on the grid.



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

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

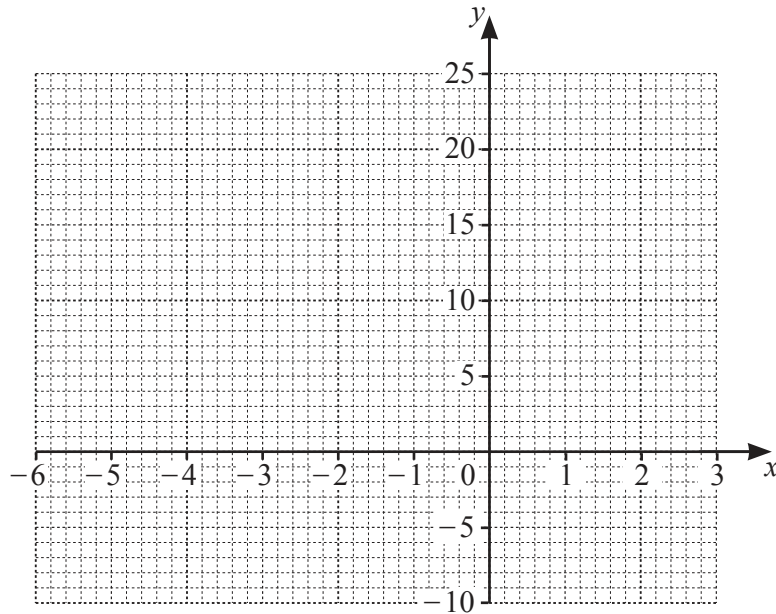


(b) (i) Complete the table of values for  $y = x^2 + 4x$ .

|     |    |    |    |    |    |    |   |   |    |   |
|-----|----|----|----|----|----|----|---|---|----|---|
| $x$ | -6 | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2  | 3 |
| $y$ | 12 | 5  | 0  | -3 |    | -3 | 0 | 5 | 12 |   |

[2]

(ii) On the grid, draw the graph of  $y = x^2 + 4x$  for  $-6 \leq x \leq 3$ .



[4]

(iii) Use your graph to solve the equation  $x^2 + 4x = 10$ .

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

9 (a) Simplify.

$$3g + 7g - 4g$$

..... [1]

(b) Solve.

$$4x + 5 = 27$$

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

(c)  $6^p \times 6^3 = 6^{17}$

Work out the value of  $p$ .

$p =$  ..... [1]

- (d) Mia buys 4 calculators and 2 pens for \$20.60 .  
Heidi buys 5 calculators and 3 pens for \$26.90 .

Write down a pair of simultaneous equations and solve them to find the cost of a calculator and the cost of a pen.

Calculator \$ .....

Pen \$ ..... [6]

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