Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0457824418

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 π, 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.

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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^2.

(i) Write 4986 correct to the nearest hundred.

..... [1]

(ii) Write 4986 in standard form.

..... [1]

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(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

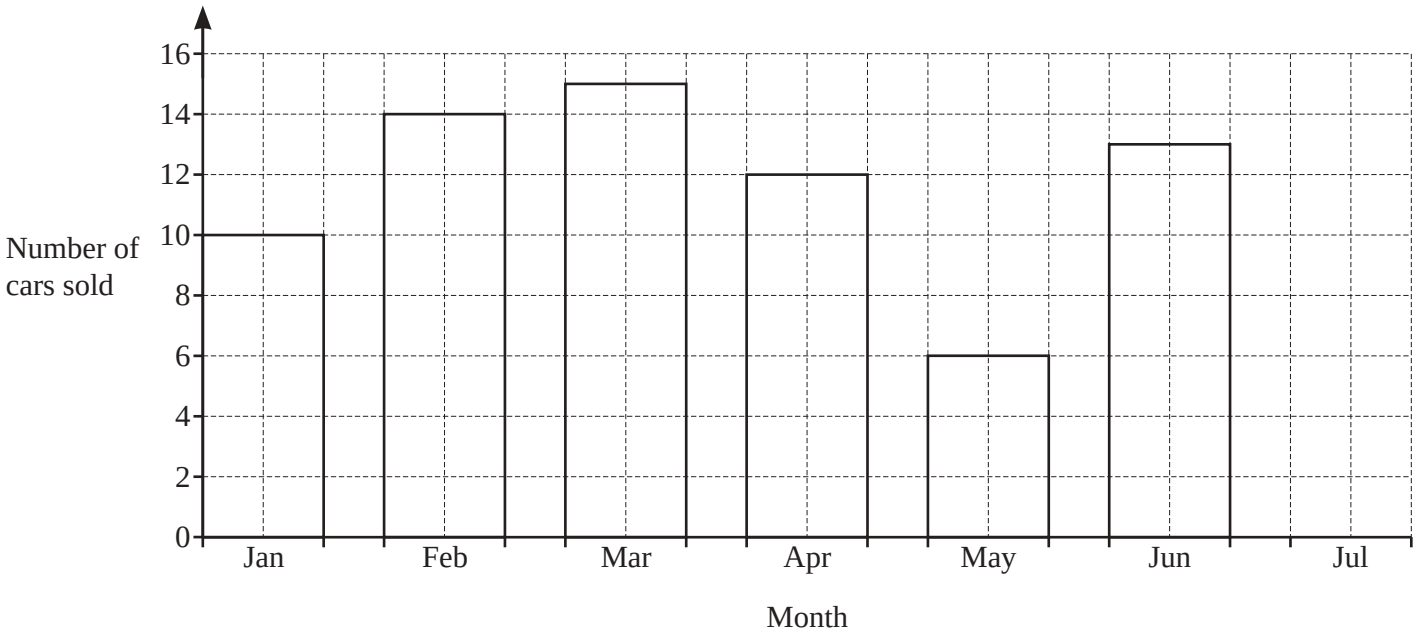
(i) Work out the actual distance between point *A* and point *B*.

..... km [2]

(ii) Point *C* is 20 km from point *A* on a bearing of 072°.

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]

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(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.

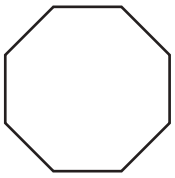
Calculate the amount they each receive.

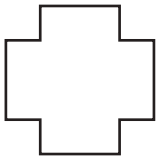
Pierre \$ .....

Luigi \$ .....

Freda \$ ..... [3]

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

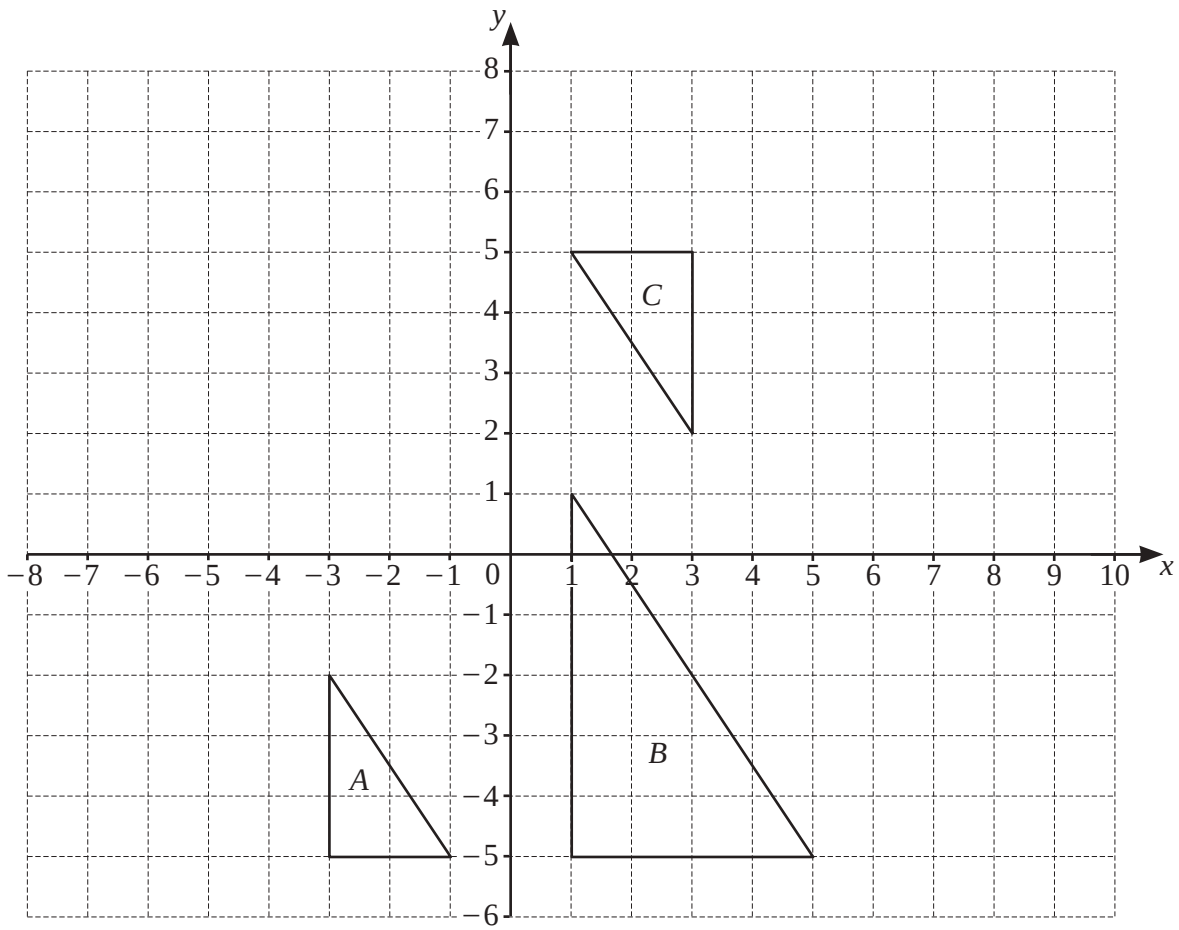




....

[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*.

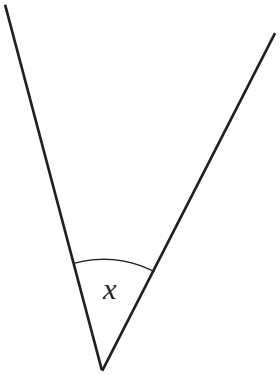
.....

..... [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)



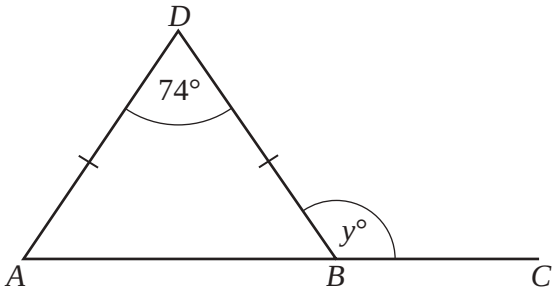
(i) Measure the size of angle x.

Angle x = ... [1]

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

..... [1]

(b)



NOT TO SCALE

ABC is a straight line and *ABD* is an isosceles triangle.

Find the value of y.

y = ... [3]

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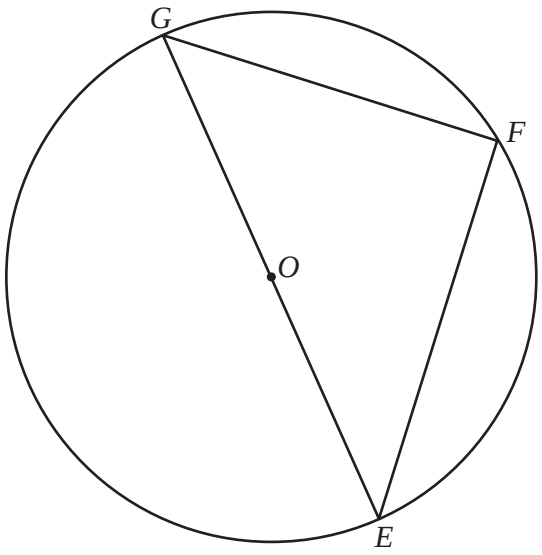
(c)



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°.

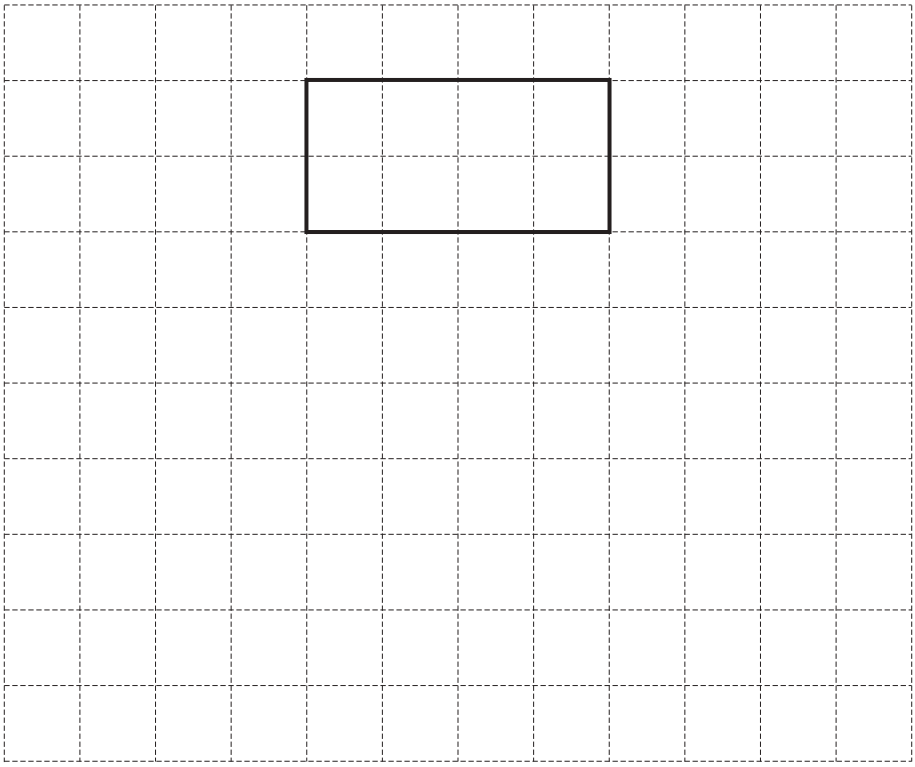
..... [1]

(iii) Calculate the area of the circle.

..... cm^2 [2]

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

(i) On the 1 cm^2 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^2 [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.

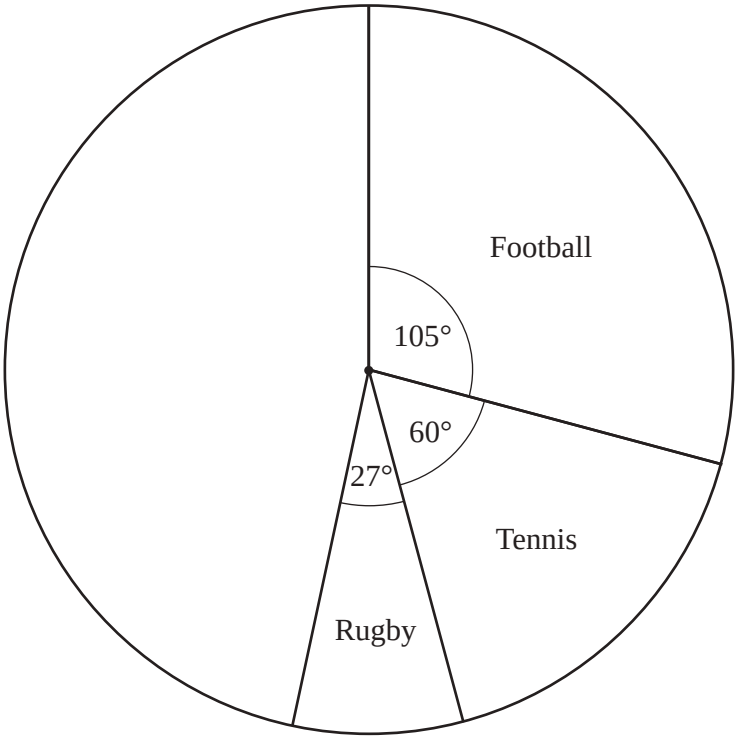
..... cm^3 [3]

(c) The length, l cm, of a line is measured as 24 cm, correct to the nearest centimetre.

Complete the statement about the value of l.

..... $\leqslant l <$ ..... [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]

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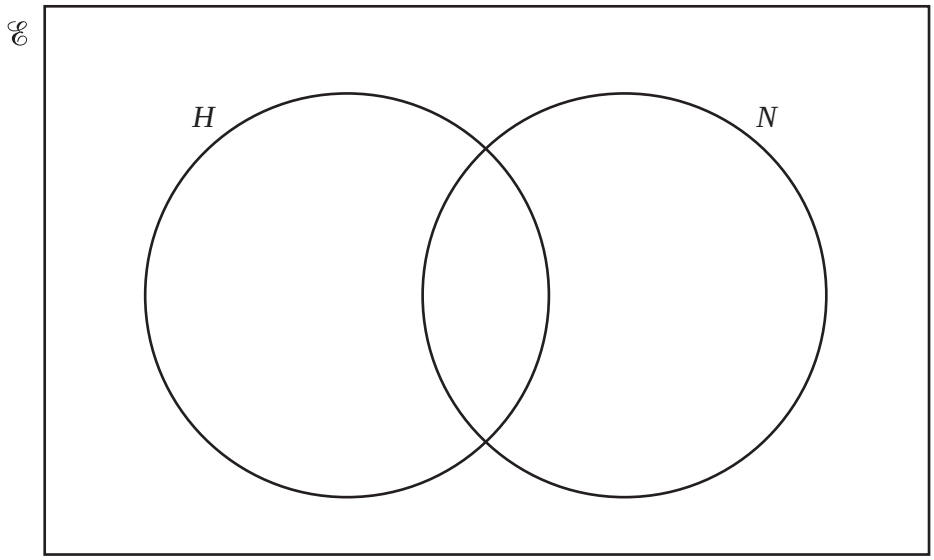
(b) There are 80 people in a group.

H = {people who play hockey}
N = {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]

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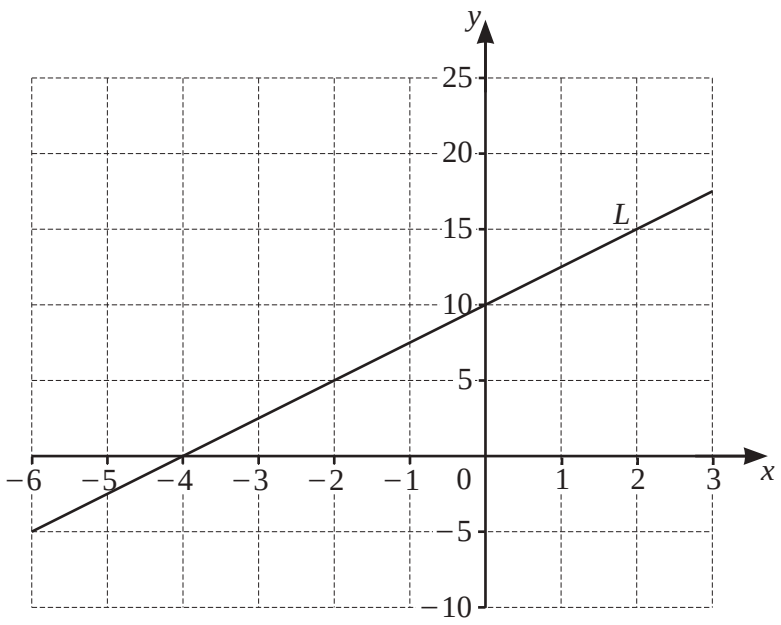
(e) A tower has two bells, *A* and *B*.
Bell *A* rings every 12 minutes.
Bell *B* rings every 14 minutes.
Both bells ring at 09 30.

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 $y = mx + c$.

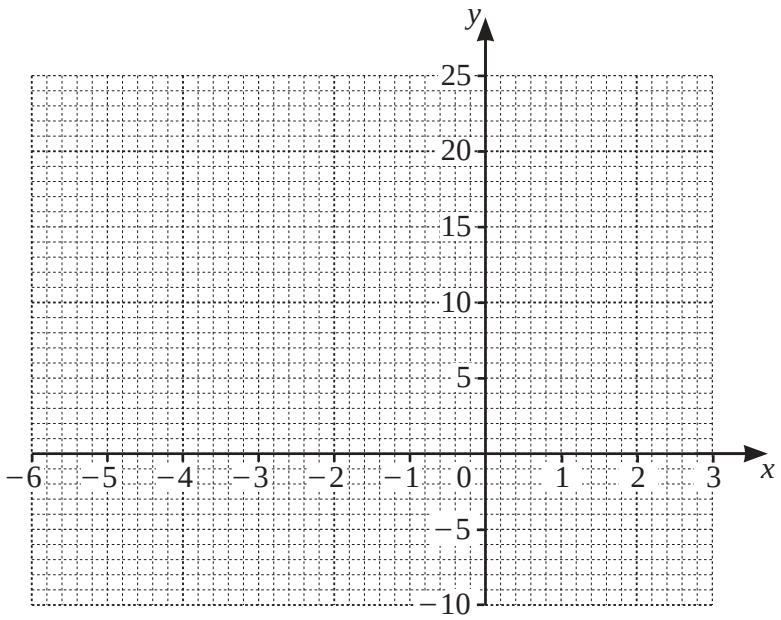
$y =$ ..... [3]

(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 $-6 \leqslant x \leqslant 3$.



[4]

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

$x =$ ..... or $x =$ ..... [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]

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(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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