Cambridge Assessment International Education

# Cambridge IGCSE™

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*3232846062*

**MATHEMATICS** **0580/21**

Paper 2 (Extended) **May/June 2024**

**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 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.

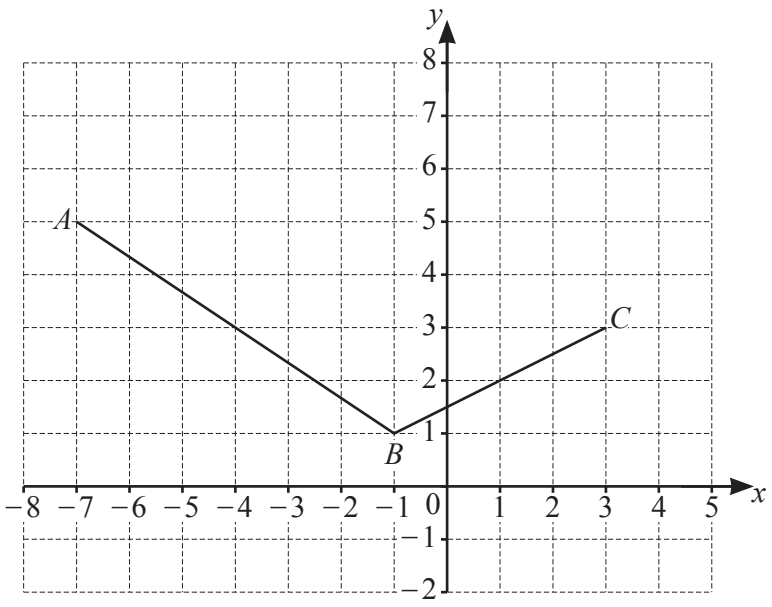
**INFORMATION**

- The total mark for this paper is 70.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages. Any blank pages are indicated.

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**1**




The diagram shows two sides of a parallelogram $ABCD$.

Find the coordinates of point $D$.

( ..... , ..... ) [2]

**2** Geetha has a box of toys.
She picks a toy at random from the box.
The probability that she picks a wooden toy is 0.6 .

**(a)** Work out the probability that she does not pick a wooden toy.

..... [1]

**(b)** The box contains three types of toys, wooden, plastic or metal.

| Type of toy | Wooden | Plastic | Metal |
|---|---|---|---|
| Number of toys | | 14 | 14 |
| Probability | 0.6 | | |

Complete the table.

[2]

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**3** The table shows some information about two sequences.

| | $n$th term | 5th term |
|---|---|---|
| Sequence $A$ | $60 - 4n$ | |
| Sequence $B$ | $n^2 - 300$ | |

**(a)** Complete the table.

[2]

**(b)** Find the smallest **positive** number in sequence $B$.

..... [2]

**4** Find the greatest **odd** number that is a factor of 140 and a factor of 210.

..... [2]

**5** Calculate.

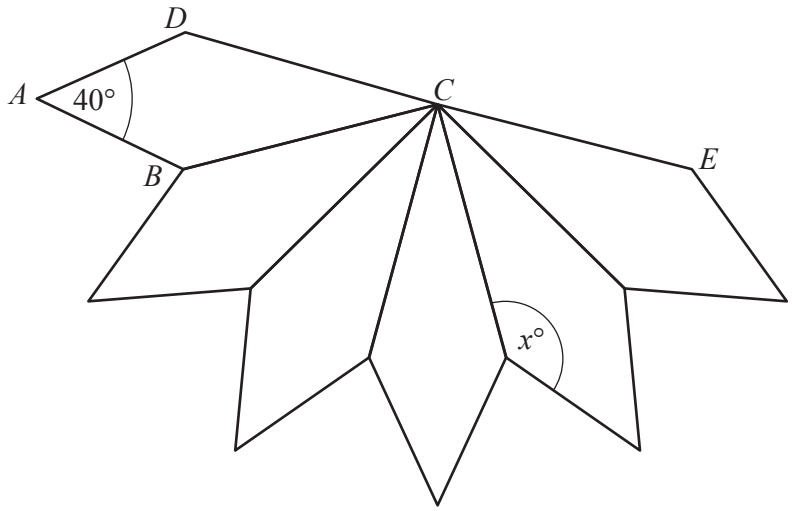
**(a)** $\sqrt[3]{343} - \sqrt{40.96}$

..... [1]

**(b)** $(192 + 4 \times 16)^{1.25}$

..... [1]

**6**




NOT TO SCALE

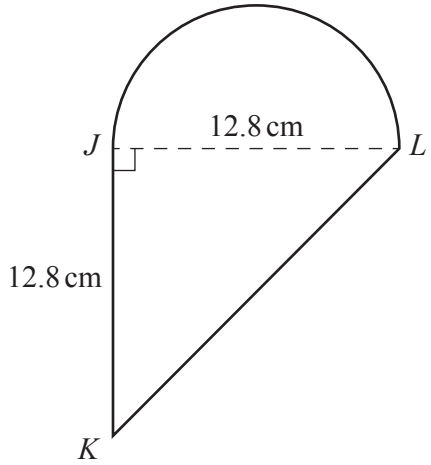
The diagram shows 5 kites that are congruent to kite *ABCD*.
Each kite is joined to the next kite along one edge.
Angle *DAB* = 40° and *DCE* is a straight line.

Find the value of *x*.

*x* = ..... [3]

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**7**




NOT TO SCALE

The diagram shows a shape made from a triangle $JKL$ and a semicircle with diameter $JL$.
$JKL$ is an isosceles right-angled triangle with $JK = JL = 12.8$ cm.

**(a)** Calculate the area of this shape.

..... $cm^2$ [3]

**(b)** Calculate the perimeter of this shape.

..... cm [4]

**8** These are the first five terms of a sequence.

11 18 25 32 39

Find an expression for the $n$th term of the sequence.

..... [2]

**9** The value of a car is \$8000.
Each year the value of the car decreases exponentially by 25%.

Calculate the value of this car after 3 years.

\$ ..... [2]

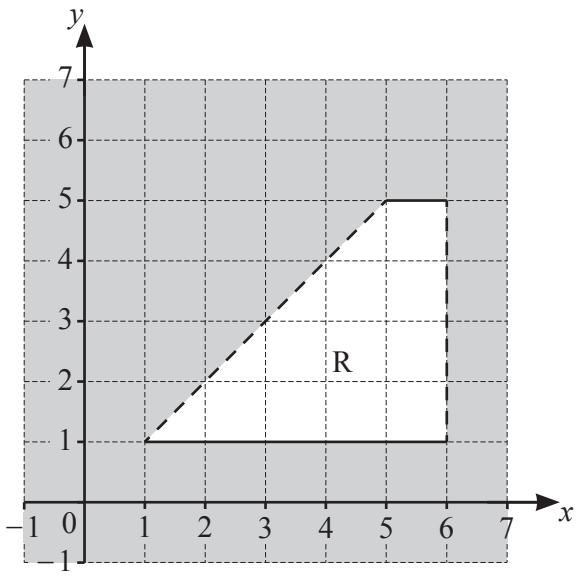
**10** Amir invests \$1500 in an account.
The account pays compound interest at a rate of $r$ % per year.
At the end of 8 years the value of his investment is \$1656.73 .

Find the value of $r$.

$r =$ ..... [3]

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**11**




Find the inequalities that define the unshaded region, R.

..... [4]

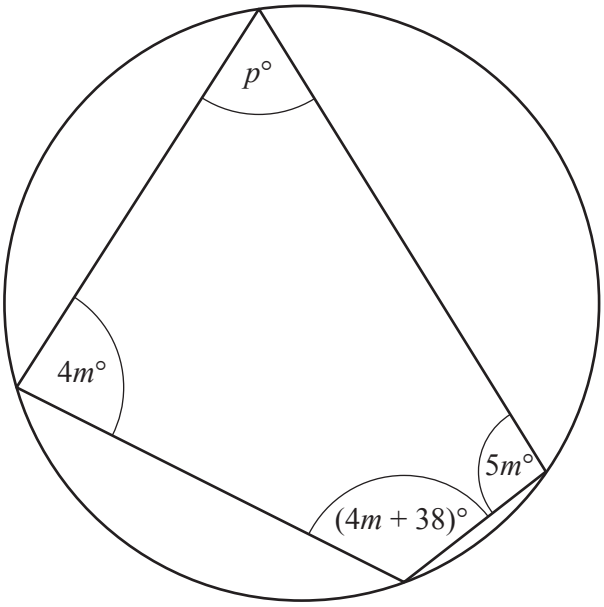
**12** Solve the simultaneous equations.
You must show all your working.

$$\frac{3x}{2} + 5y = 5$$
$$4x - 3y = 46$$

$x =$ .....

$y =$ ..... [4]

**13**




NOT TO SCALE

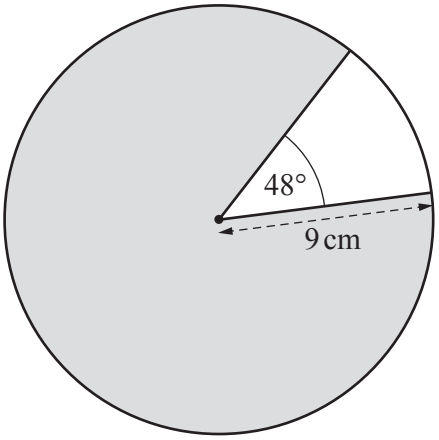
The diagram shows a cyclic quadrilateral.

Find the value of $p$.

$p =$ ..... [3]

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**14**




NOT TO SCALE

The diagram shows a circle with radius 9 cm.

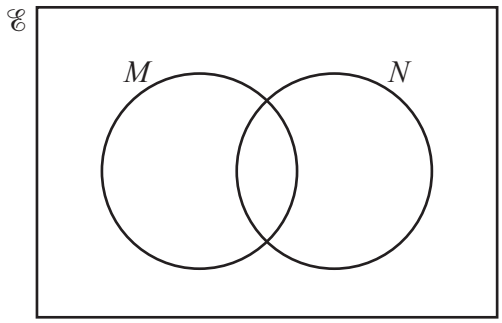
Calculate the area of the shaded major sector.

..... $cm^2$ [3]

**15** Write $0.1\dot{4}\dot{6}$ as a fraction in its simplest form.
You must show all your working.

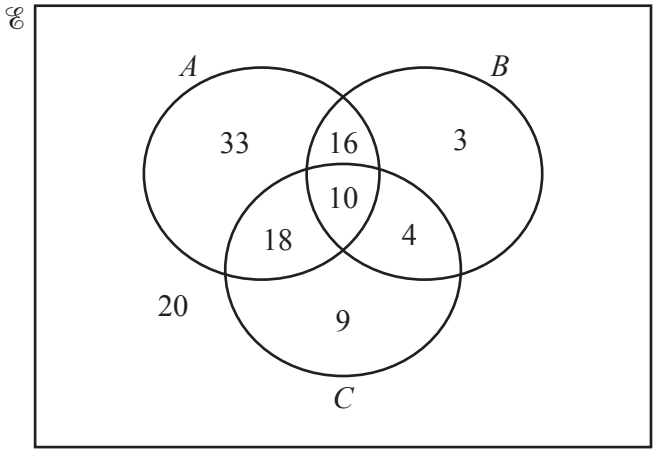
..... [3]

**16** **(a)** In the Venn diagram, shade the region $M' \cap N'$.



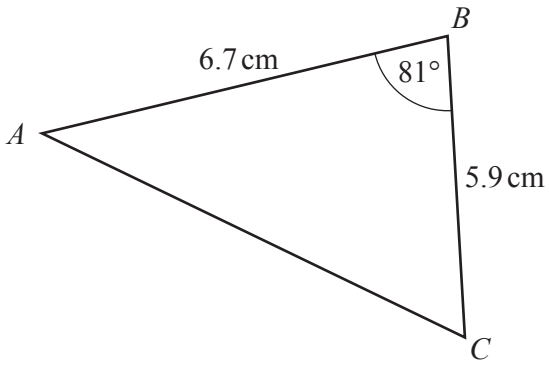

[1]

**(b)** Find $\mathrm{n}(B \cap (A' \cup C))$.




..... [1]

**17**

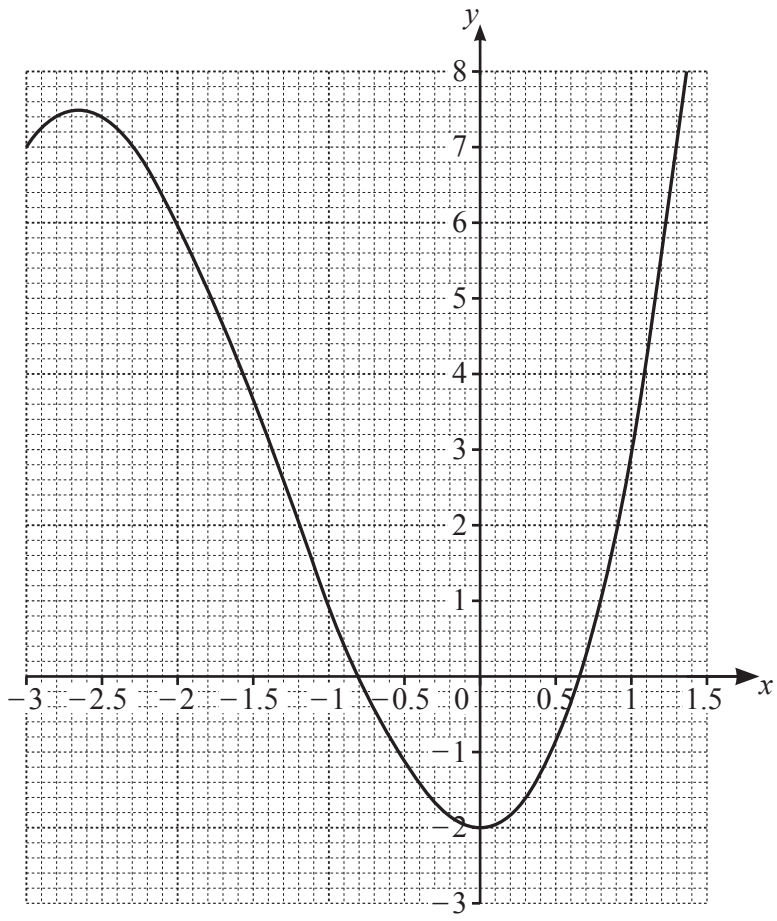



NOT TO SCALE

Calculate the area of triangle $ABC$.

..... $cm^2$ [2]

**18**




The diagram shows the graph of $y = x^3 + 4x^2 - 2$ for $-3 \leqslant x \leqslant 1.5$.

By drawing a suitable straight line, solve the equation $x^3 + 4x^2 - 2 = 2x$ for $-3 \leqslant x \leqslant 1.5$.

$x =$ ..... or $x =$ ..... [3]

**19** Factorise completely.

**(a)** $12m^2 - 75t^2$

..... [3]

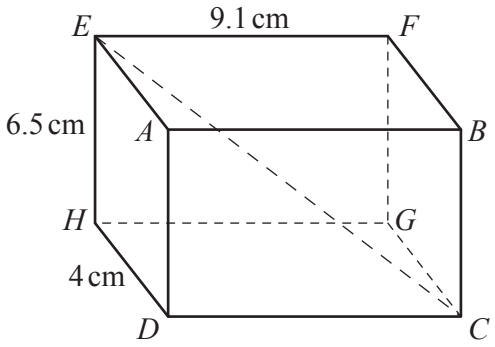
**(b)** $xy + 15 + 3y + 5x$

..... [2]

**20** Solve the equation $8\sin x + 6 = 1$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [3]

**21**




NOT TO SCALE

The diagram shows a cuboid.
$HD = 4$ cm, $EH = 6.5$ cm and $EF = 9.1$ cm.

Calculate the angle between $CE$ and the base $CDHG$.

..... [4]

**22** Bag *A* and bag *B* each contain red counters and blue counters only.
Stephan picks a counter at random from bag *A* and Jen picks a counter at random from bag *B*.

The probability that Stephan picks a red counter is 0.4 .
The probability that Stephan and Jen both pick a red counter is 0.25 .

Find the probability that Stephan and Jen both pick a blue counter.

..... [4]

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