Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

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 π, use either your calculator value or 3.142.

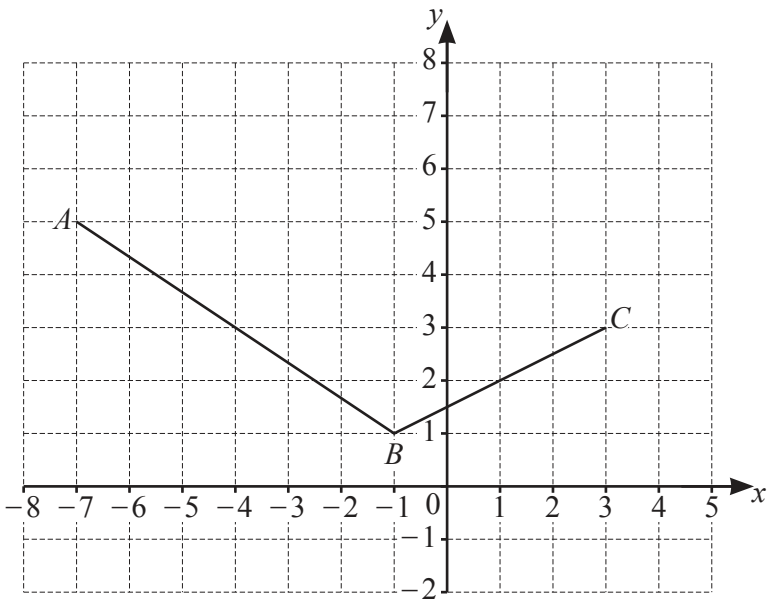
INFORMATION

- 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.

DC (DE/CT) 329229/1

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]

3 The table shows some information about two sequences.

	nth 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.

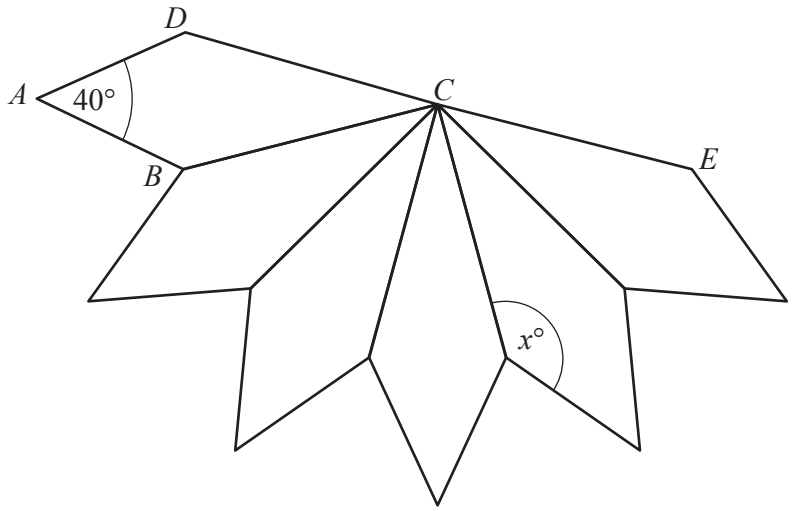
(a) $\sqrt[3]{343} - \sqrt{40.96}$

..... [1]

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

..... [1]

6



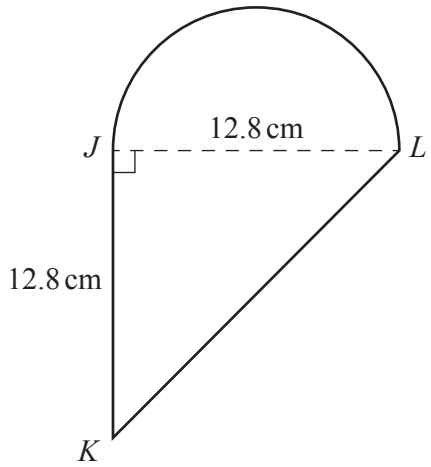
NOT TO SCALE

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]

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 nth 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.

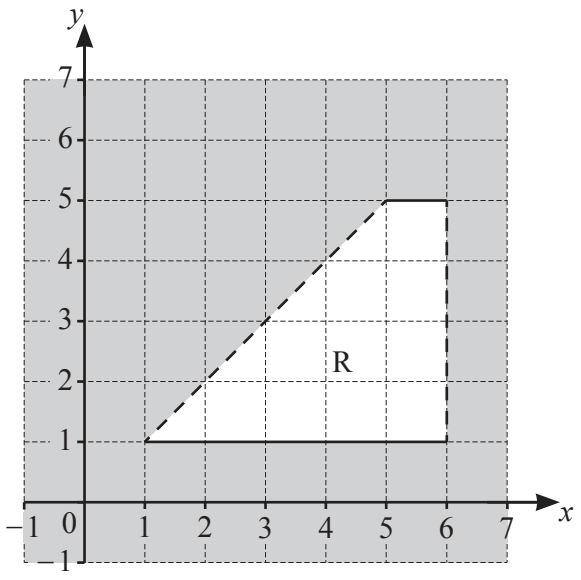
\$ ..... [2]

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]

11



Find the inequalities that define the unshaded region, R.

..... [4]

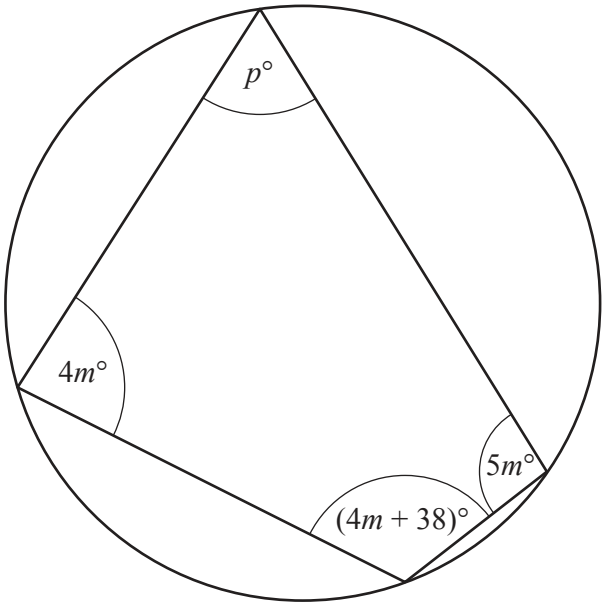
12 Solve the simultaneous equations.
You must show all your working.

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

$x =$ .....

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

13



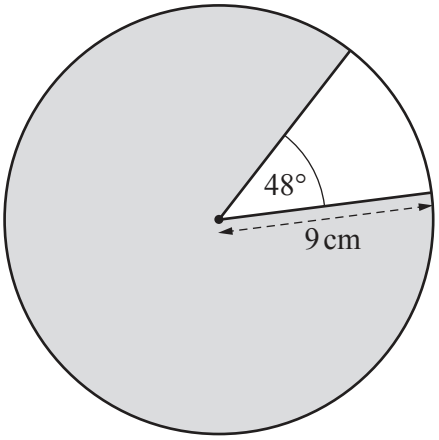
NOT TO SCALE

The diagram shows a cyclic quadrilateral.

Find the value of p.

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

14



NOT TO SCALE

The diagram shows a circle with radius 9 cm.

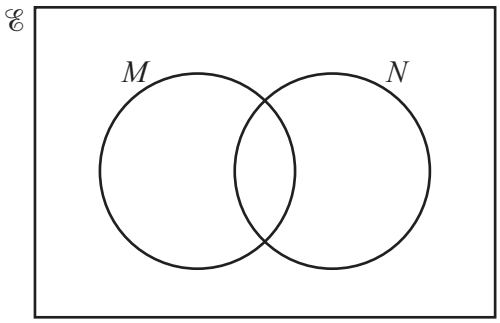
Calculate the area of the shaded major sector.

..... cm^2 [3]

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

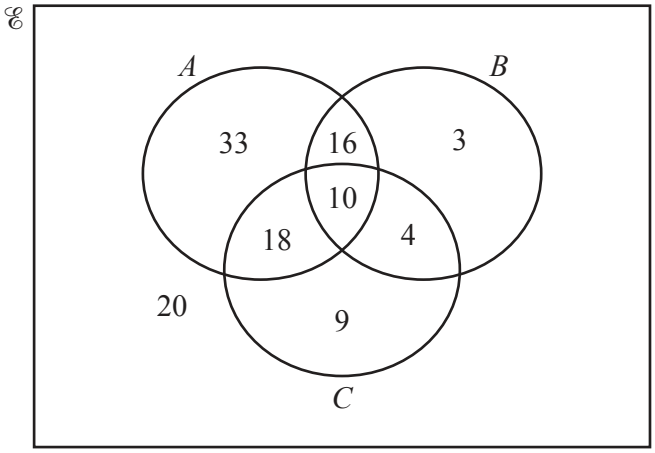
..... [3]

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



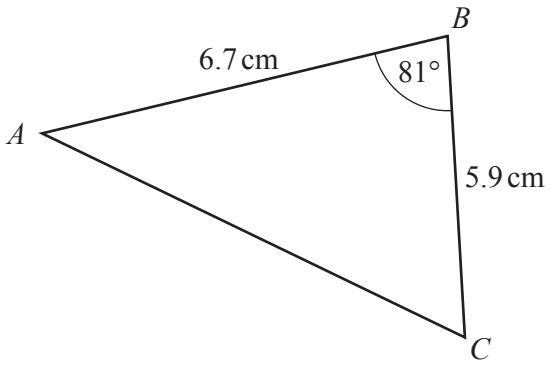
[1]

(b) Find $n(B \cap (A' \cup C))$.



..... [1]

17

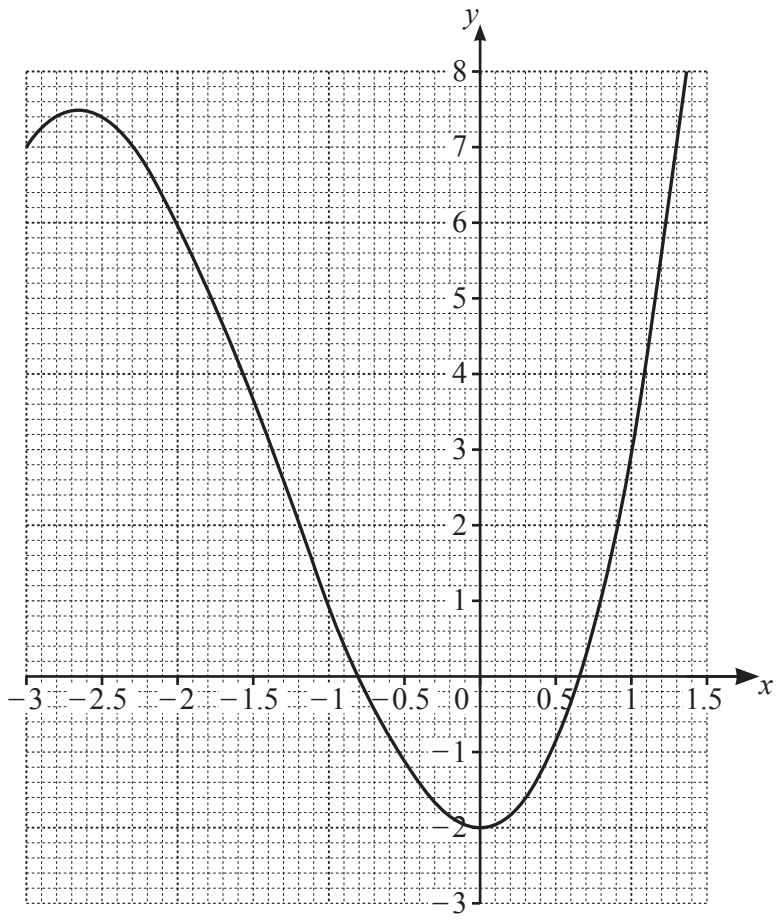


NOT TO SCALE

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]

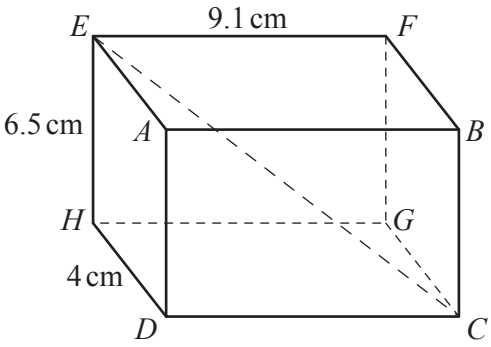
(b) $xy + 15 + 3y + 5x$

..... [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]

BLANK PAGE