Write your name here

Surname	Other names

Edexcel GCSE

Centre Number	Candidate Number

Methods in Mathematics

Unit 2: Methods 2

For Approved Pilot Centres ONLY

Higher Tier

Mock Paper
Time: 1 hour 45 minutes

Paper Reference
5MM2H/01

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used**.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
  – *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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W 3 9 7 3 8 A 0 1 2 0

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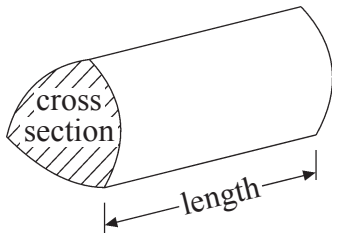
GCSE Mathematics 2MM01

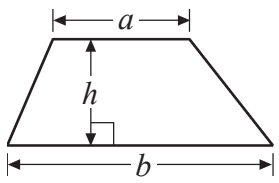
Formulae – Higher Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length

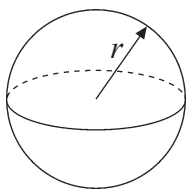


Area of trapezium $= \frac{1}{2}(a+b)h$



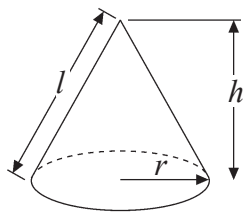
Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$

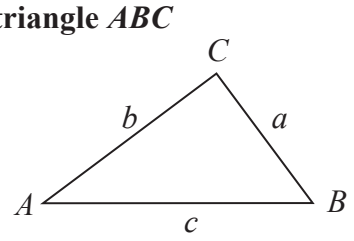


Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi rl$



In any triangle *ABC*



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$
where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle $= \frac{1}{2}ab\sin C$

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1 Share 320 in the ratio 1 : 3

.....

(Total for Question 1 is 2 marks)

2 Use your calculator to work out $\dfrac{89.2 - 65.9}{2.5 \times 3.2}$

.....

(Total for Question 2 is 2 marks)

***3**

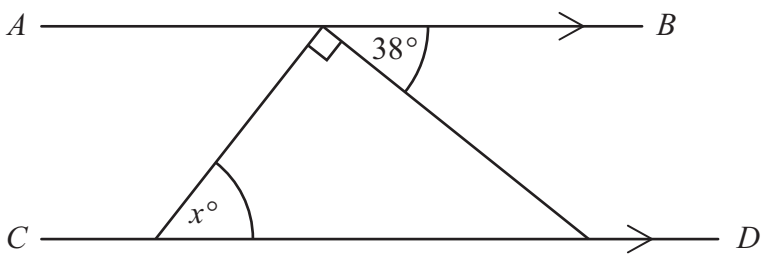


Diagram **NOT** accurately drawn

AB is parallel to *CD*.

Work out the size of the angle marked $x°$.
Give reasons for your answer.

(Total for Question 3 is 3 marks)

4 (a) Work out 45% of 1600

.....

(2)

(b) Increase £240 by 21%

£.....

(2)

(c) Write 120 out of 200 as a percentage.

.....%

(2)

(Total for Question 4 is 6 marks)

5 7 pens cost £6.23
Work out the cost of 12 of these pens.

£.....

(Total for Question 5 is 2 marks)

6 $P = 2a + 3b$
$a = 5$
$b = 4$

(a) Work out the value of P.

$P =$ .....

(2)

$L = 5x - 3y$
$x = -4$
$y = -2$

(b) Work out the value of L.

$L =$ .....

(2)

$T = 2w^2 + 3w$
$w = -5$

(c) Work out the value of T.

$T =$ .....

(2)

(d) Make a the subject of the formula $v = 6a + u$

.....

(2)

(Total for Question 6 is 8 marks)

7

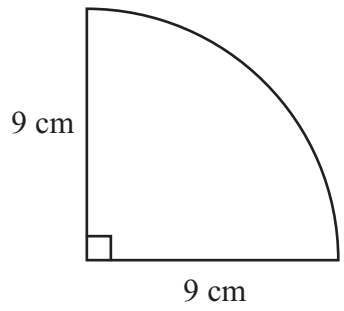


Diagram **NOT** accurately drawn

A quarter circle has a radius of 9 cm.

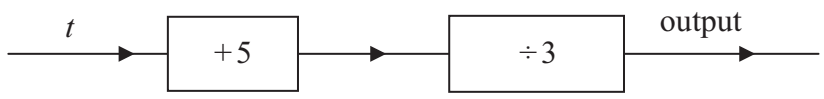
Work out the perimeter of the quarter circle.

Give your answer correct to 1 decimal place.

..... cm

(Total for Question 7 is 4 marks)

8 The input for this number machine is t.



Find an expression, in terms of t, for the output.

.....

(Total for Question 8 is 2 marks)

9 Here is a solid cube.

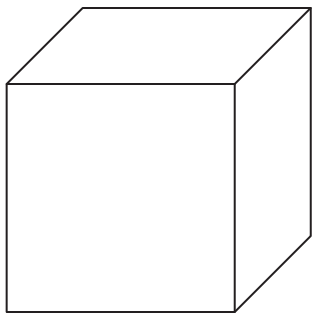


Diagram **NOT** accurately drawn

The cube has a volume of 125 cm^3.

Work out the surface area of the cube.

..... cm^2

(Total for Question 9 is 4 marks)

10 n is an integer and $-1 \leqslant n < 4$

(a) Write down all the possible values of n.

.....

(2)

(b) Solve $2x - 5 > 11$

.....

(2)

(Total for Question 10 is 4 marks)

11

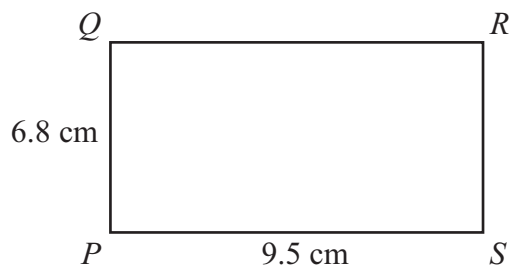


Diagram **NOT** accurately drawn

$PQRS$ is a rectangle.

Work out the length of the diagonal PR.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 11 is 3 marks)

12 The diagram shows a solid prism.

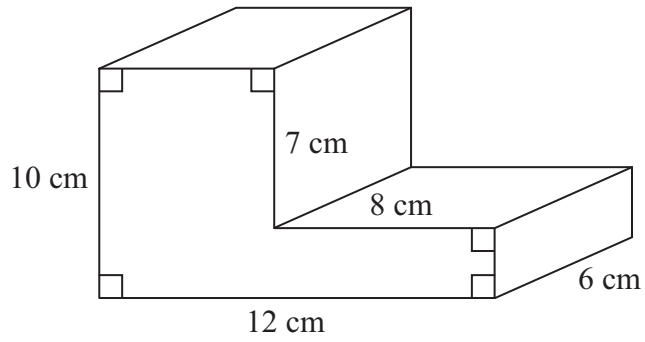


Diagram **NOT** accurately drawn

Work out the volume of the prism.

.....

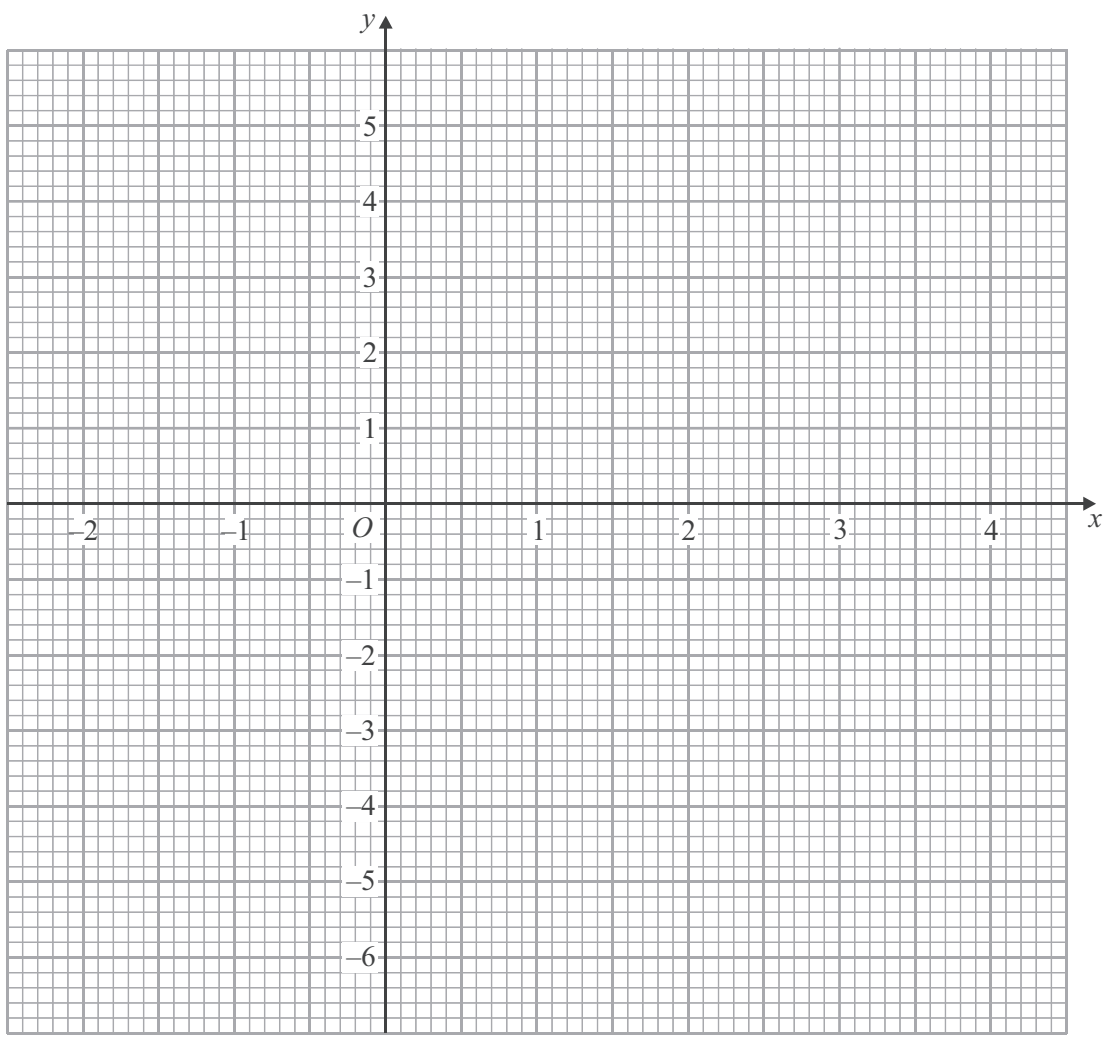
(Total for Question 12 is 5 marks)

13 (a) Complete the table for $y = x^2 - 2x - 4$

x	–2	–1	0	1	2	3	4
y		–1		–5	–4		4

(2)

(b) On the grid, draw the graph of $y = x^2 - 2x - 4$



(2)

(c) Use the graph to find estimates of the values of x for which $x^2 - 2x - 4 = 0$

.....

(2)

(Total for Question 13 is 6 marks)

***14** The diagram shows three sides of a regular polygon.

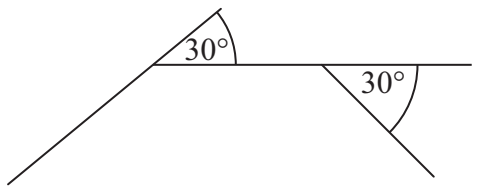


Diagram **NOT** accurately drawn

Each exterior angle of the polygon is 30°.
Explain why this type of polygon will **not** tessellate.

(Total for Question 14 is 3 marks)

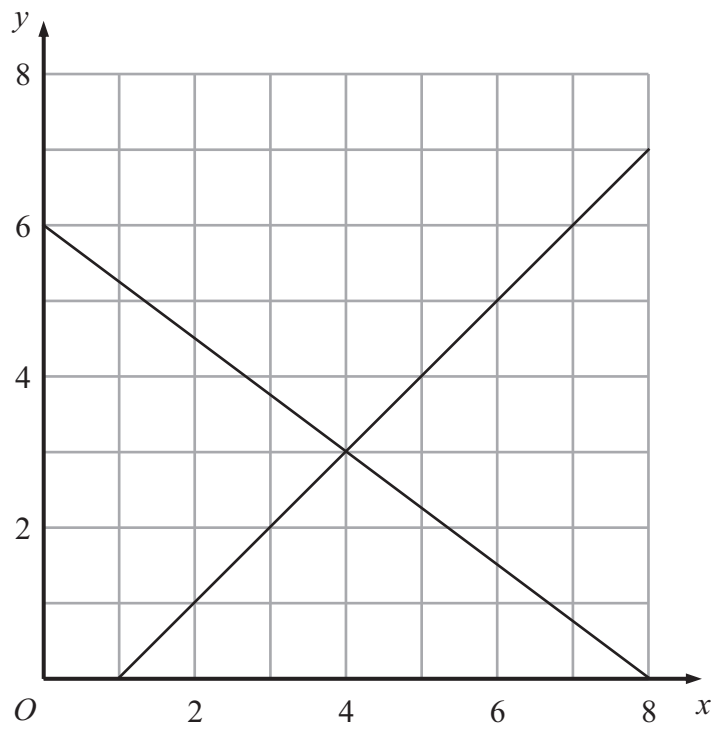
15 $a = \sqrt{\dfrac{8\times10^9 + 3.7\times10^8}{2\times10^3}}$

Work out the value of a.
Give your answer in standard form correct to 3 significant figures.

.....

(Total for Question 15 is 3 marks)

16 The graphs of the straight lines with equations $4y + 3x = 24$ and $y = x - 1$ have been drawn on the grid.



(a) Use the graphs to solve the simultaneous equations

$4y + 3x = 24$
$y = x - 1$

$x =$ .....

$y =$ .....

(1)

(b) $4y + 3x < 24$ $\quad y < x - 1$ $\quad x < 5$ $\quad y > 0$

x and y are integers.

On the grid, mark with a cross (×) the **three** points which satisfy **all** these 4 inequalities.

(3)

(Total for Question 16 is 4 marks)

17

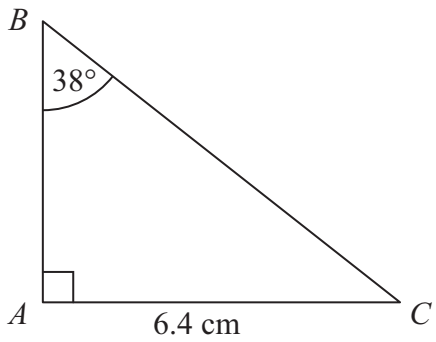


Diagram **NOT** accurately drawn

ABC is a right-angled triangle.

AC = 6.4 cm.
Angle *B* = 38°.

Work out the length of *AB*.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 17 is 3 marks)

18 When a number is decreased by 12% the answer is 308
Work out the number.

.....

(Total for Question 18 is 3 marks)

19 Here is a cylinder.

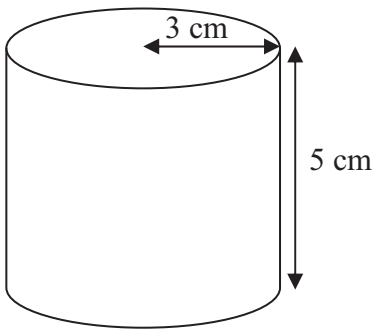


Diagram **NOT** accurately drawn

The height of the cylinder is 5 cm.
The radius of the cylinder is 3 cm.

Work out the volume of the cylinder.
Give your answer as a multiple of π.

..... cm^3

(Total for Question 19 is 2 marks)

20 Make c the subject of the formula $b = \dfrac{5-3c}{c+2}$

$c =$ .....

(Total for Question 20 is 4 marks)

21 d is directly proportional to the square of m.
$d = 60$ when $m = 2$

(a) Express d in terms of m.

.....

(3)

(b) Work out the value of d when $m = 6$

$d =$ .....

(1)

(Total for Question 21 is 4 marks)

22 Solve $2x^2 - 7x + 1 = 0$

Give your solutions correct to 2 decimal places.

.....

(Total for Question 22 is 3 marks)

23

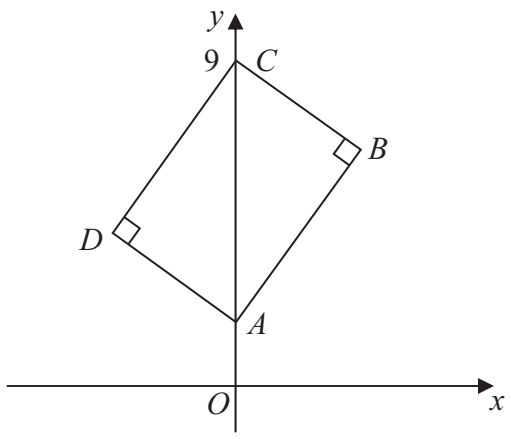


Diagram **NOT** accurately drawn

ABCD is a rectangle.
C is the point (0, 9).

The equation of the straight line through *A* and *B* is $y = 3x + 2$

Find an equation of the straight line through *B* and *C*.

.....

(Total for Question 23 is 2 marks)

24

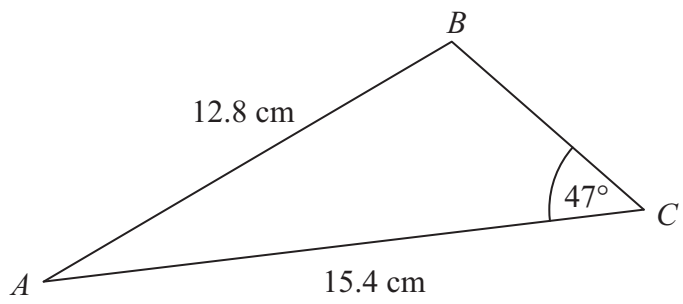


Diagram **NOT** accurately drawn

Work out the area of triangle *ABC*.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 24 is 5 marks)

25

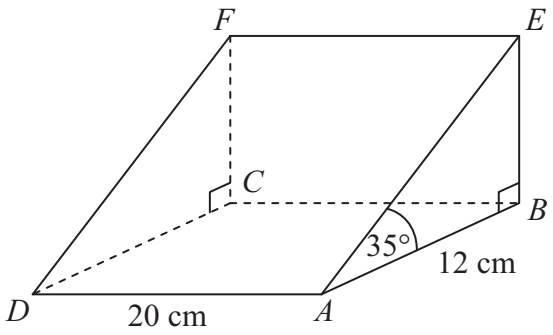


Diagram **NOT** accurately drawn

The diagram represents a prism.
AEFD and *ABCD* are rectangles.

AB = 12 cm.
AD = 20 cm.
Angle *ABE* = Angle *DCF* = 90°.
Angle *BAE* = 35°.

Calculate the size of the angle that the line *ED* makes with the plane *ABCD*.
Give your answer correct to 1 decimal place.

.....°

(Total for Question 25 is 5 marks)

26 Solve the simultaneous equations

$$x^2 + y^2 = 18$$

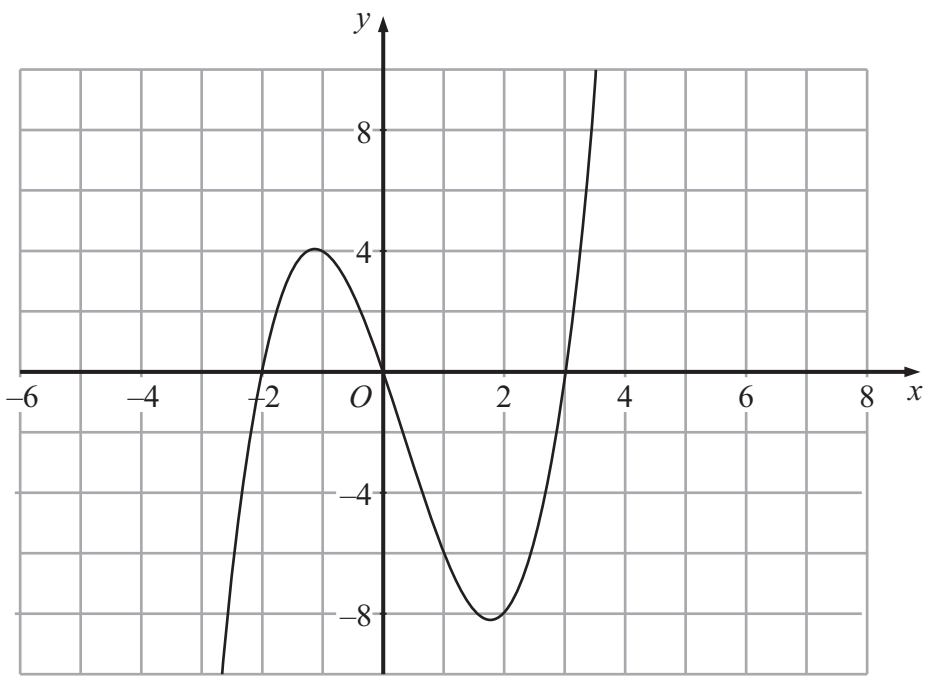
$$x = 2y - 3$$

.....

(Total for Question 26 is 6 marks)

27 The graph of $y = f(x)$ is shown on the grid.

On this grid, sketch the graph of $y = f(x + 2)$



(Total for Question 27 is 2 marks)

TOTAL FOR PAPER IS 100 MARKS