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

Thursday 21 June 2012 – Afternoon
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.

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 ▶

P40653A

6/6/7/e2

P 4 0 6 5 3 A 0 1 2 4

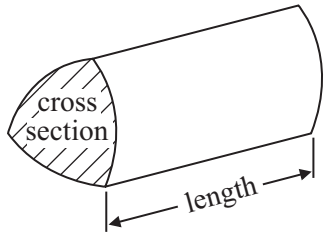
PEARSON

GCSE Mathematics 2MM01

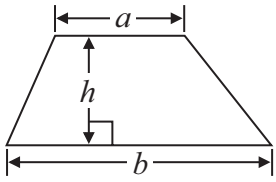
Formulae: Higher Tier

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

Volume of prism = area of cross section × length

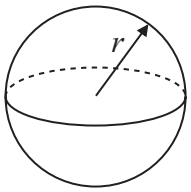


Area of trapezium = $\frac{1}{2}(a + b)h$



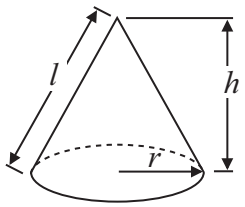
Volume of sphere = $\frac{4}{3}\pi r^3$

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

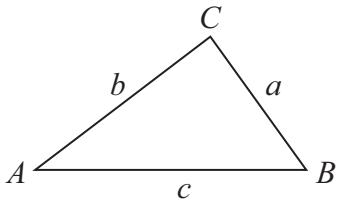


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = πrl



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 Use your calculator to work out

$$\frac{2.4 \times 3.6}{1.4 \times \sqrt{40}}$$

Write down all the figures on your calculator display.

.....

(Total for Question 1 is 2 marks)

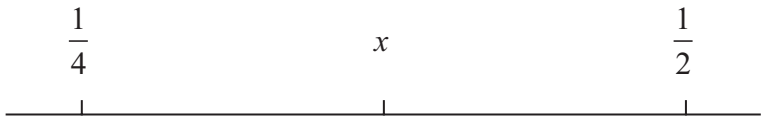
2 A circle has a diameter of 10 cm.

Work out the circumference of the circle.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 2 is 2 marks)

3



x is halfway between $\frac{1}{4}$ and $\frac{1}{2}$

Work out the value of x.

.....

(Total for Question 3 is 3 marks)

4 Alf and Betty share some money in the ratio 3 : 5

Work out the percentage of the money that Alf gets.

..... %

(Total for Question 4 is 2 marks)

5 x is an integer.

$-3 \leqslant x < 2$

Write down all the possible values of x.

.....

(Total for Question 5 is 2 marks)

6 Here are two boxes.

There are x marbles in box A.
There are 4 more marbles in box B than in box A.

The total number of marbles in the two boxes is T.

(a) Write a formula, in terms of x, for the total number of marbles, T, in the two boxes.

.....

(3)

$x = 13$

(b) Work out the value of T.

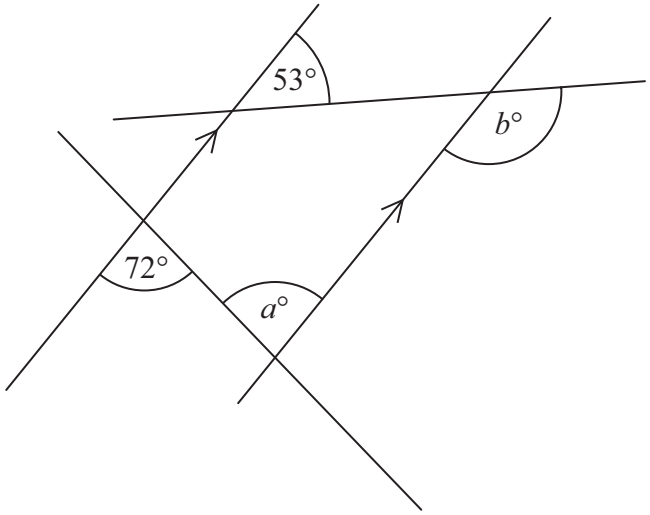
.....

(2)

(Total for Question 6 is 5 marks)

7

Diagram **NOT** accurately drawn



(a) (i) Find the value of a.

.....

(ii) Give a reason for your answer.

.....

(2)

(b) Work out the value of b.

.....

(2)

(Total for Question 7 is 4 marks)

***8** Here is a shape.

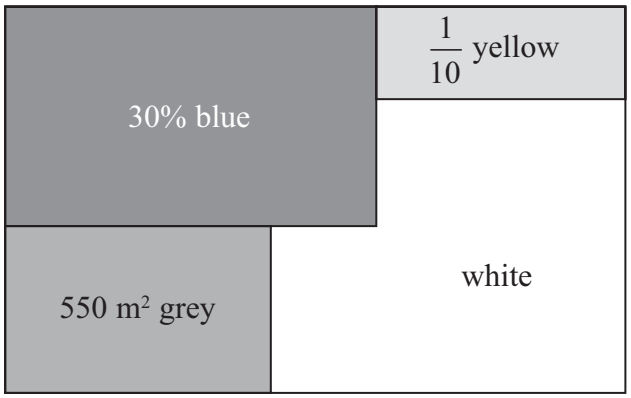


Diagram **NOT** accurately drawn

The total area of the shape is 1640 m^2.

30% of the shape is blue.

$\frac{1}{10}$ of the shape is yellow.

550 m^2 of the shape is grey.

The rest of the shape is white.

Is the white area more than 400 m^2?

(Total for Question 8 is 5 marks)

9 Here is a regular hexagon.

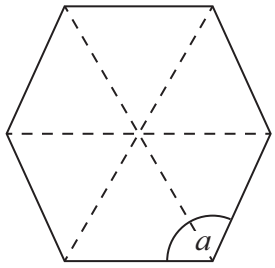


Diagram **NOT** accurately drawn

(a) Write down the size of the interior angle, marked a.

..... °

(1)

(b)

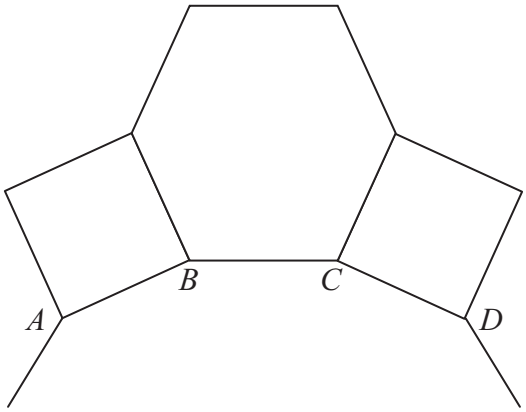


Diagram **NOT** accurately drawn

The diagram shows two squares and a regular hexagon.

AB, BC and CD are 3 sides of a regular polygon with n sides.

Work out the value of n.

.....

(3)

(Total for Question 9 is 4 marks)

10 30% of a number is 120

Work out the number.

.....

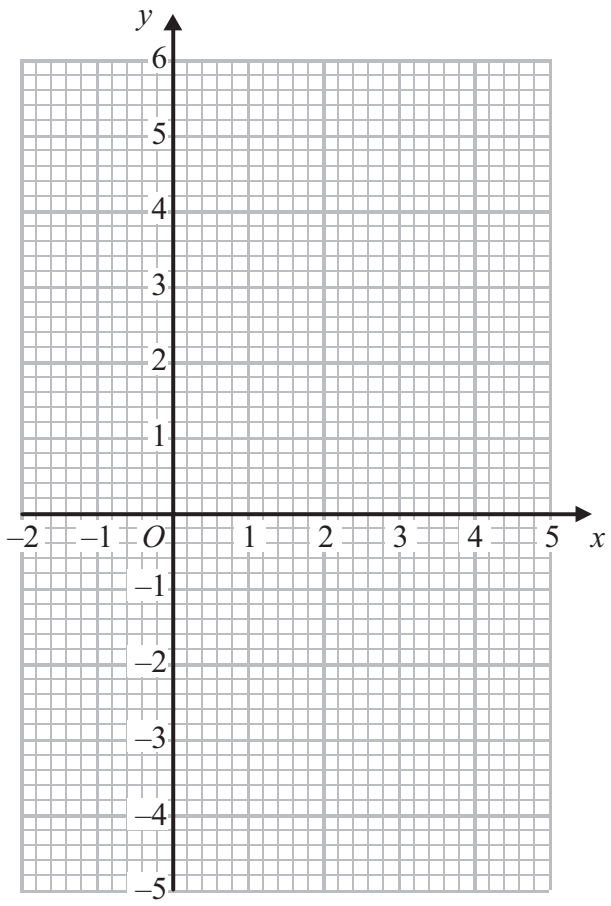
(Total for Question 10 is 3 marks)

11 (a) Complete the table of values for $y = x^2 - 3x + 1$

x	–1	0	1	2	3	4
y		1			1	5

(2)

(b) Draw the graph of $y = x^2 - 3x + 1$ for values of x from –1 to 4



(2)

(c) Use your graph to find estimates for the solutions of

$$x^2 - 3x + 1 = 4$$

.....

(2)

(Total for Question 11 is 6 marks)

***12** Here is a solid prism.

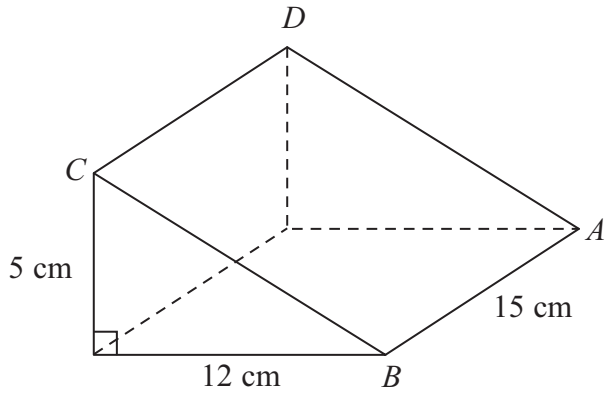


Diagram **NOT** accurately drawn

Calculate the area of the sloping face *ABCD* of the prism.

(Total for Question 12 is 5 marks)

13 (a) $x^6 = 1000$

Find the value of x.
Give your answer correct to 3 significant figures.

.....

(1)

(b) $y^{\frac{1}{2}} = 1000$

Find the value of y.

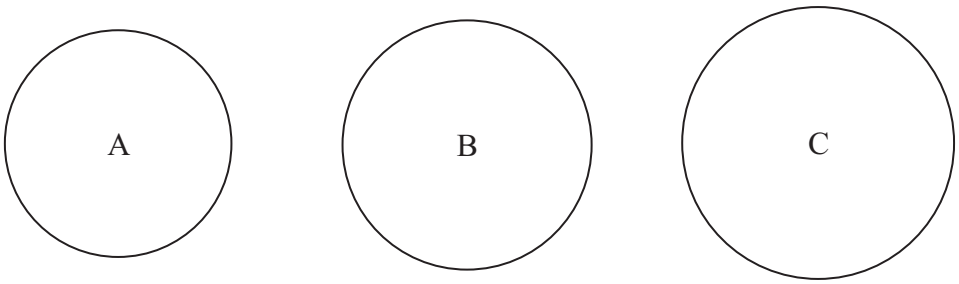
.....

(1)

(Total for Question 13 is 2 marks)

***14** Here are three circles A, B and C.

Diagrams **NOT** accurately drawn



The area of circle A is 200 cm^2.

The area of circle B is 10% larger than the area of circle A.

The area of circle C is 10% larger than the area of circle B.

How much larger is the area of circle C than the area of circle A?

(Total for Question 14 is 4 marks)

15

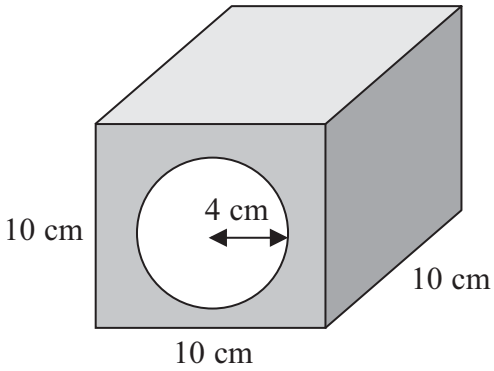


Diagram **NOT** accurately drawn

A solid is in the shape of a cube.
The solid has edges of length 10 cm.
There is a circular hole of radius 4 cm all the way through the solid.

Work out the volume of the solid.
Give your answer correct to 3 significant figures.

..... cm^3

(Total for Question 15 is 4 marks)

16 What is the smallest integer to multiply 0.35 by to get a whole number?

.....

(Total for Question 16 is 2 marks)

17 $y = a + bx^2$

$a = 4.129 \times 10^7$
$b = 3.2 \times 10^{-2}$
$x = 45\,000$

(a) Work out the value of y.

.....

(3)

(b) Rearrange $y = a + bx^2$

to make x the subject.

.....

(2)

(Total for Question 17 is 5 marks)

18

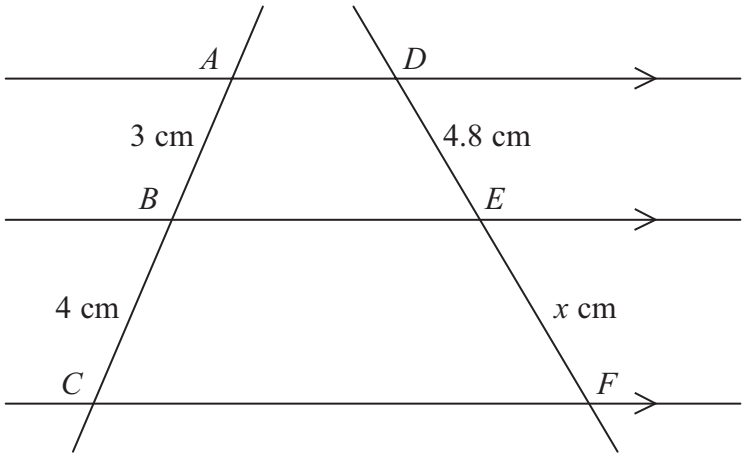


Diagram **NOT** accurately drawn

ABC and *DEF* are straight lines.

AB = 3 cm.
BC = 4 cm.
DE = 4.8 cm.
EF = *x* cm.

(a) Work out the value of *x*.

.....

(2)

The trapezium *ABED* has an area of 9.9 cm^2.

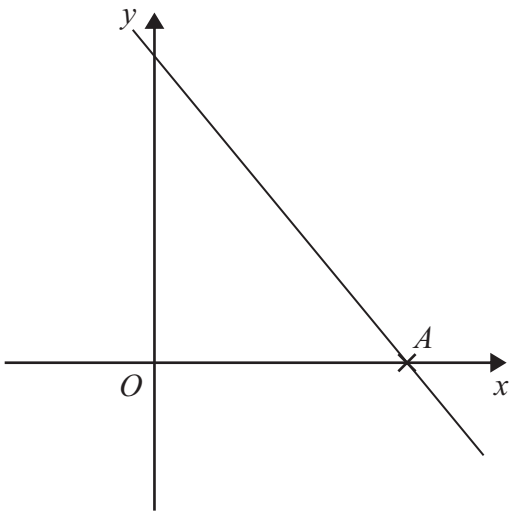
(b) Calculate the area of the trapezium *BCFE*.

..... cm^2

(2)

(Total for Question 18 is 4 marks)

19 Here is a sketch of the graph of the straight line with equation $3y = 9 - 4x$



The line with equation $3y = 9 - 4x$ cuts the x-axis at the point A.

(a) Work out the coordinates of the point A.

.....

(2)

The line with equation $3y = 9 - 4x$
intersects the line with equation $x + y = 12$
at the point B.

(b) Find the coordinates of the point B.

.....

(4)

(Total for Question 19 is 6 marks)

20

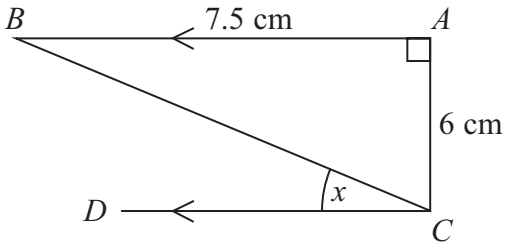


Diagram **NOT** accurately drawn

ABC is a right-angled triangle.
Angle *BAC* = 90°.

AC = 6 cm.
AB = 7.5 cm.

CD is parallel to *AB*.

Calculate the size of angle *x*.

..... °

(Total for Question 20 is 4 marks)

21 y is directly proportional to the square of x.

When $x = 2$, $y = 24$

Find the value of y when $x = 3$

.....

(Total for Question 21 is 4 marks)

22 Solve $x^2 + 10x + 7 = 0$

Give your solutions correct to 3 significant figures.

.....

(Total for Question 22 is 3 marks)

23

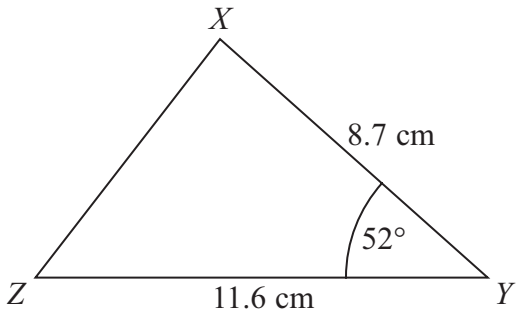


Diagram **NOT** accurately drawn

In the triangle XYZ

$XY = 8.7$ cm,
$YZ = 11.6$ cm,
Angle $XYZ = 52°$.

(a) Work out the area of triangle XYZ.
Give your answer correct to 3 significant figures.

..... cm^2

(2)

(b) Work out the length of XZ.
Give your answer correct to 3 significant figures.

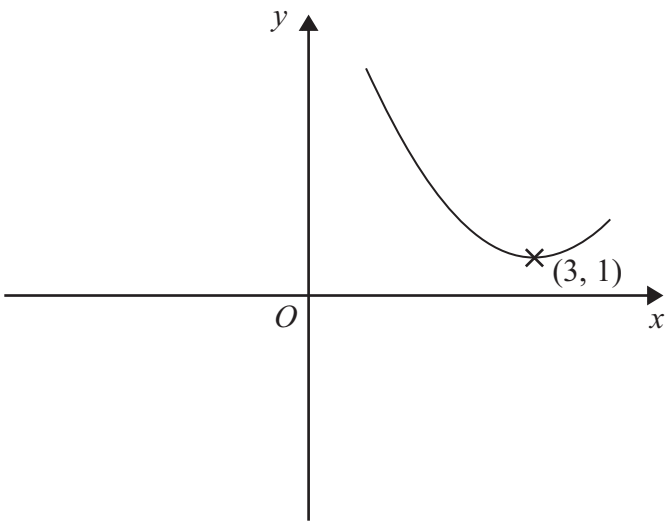
..... cm

(3)

(Total for Question 23 is 5 marks)

24 $f(x) = x^2 - 6x + 10$

Here is a sketch of the graph of $y = f(x)$



The minimum point of the graph has coordinates (3, 1).

(a) Write down the coordinates of the minimum point of the graph with equation $y = f(x + 2)$

.....

(2)

The equation $y = f(x + 2)$ can be written in the form $y = x^2 + bx + 2$

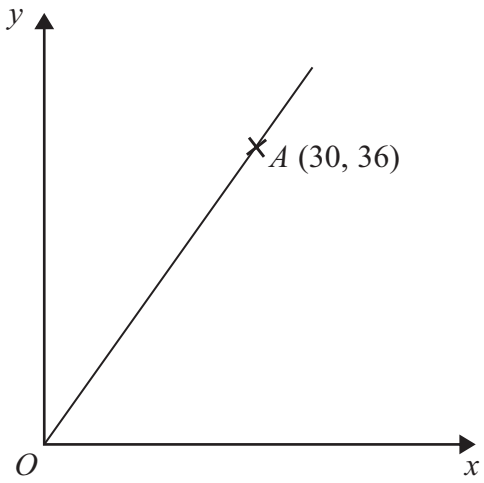
(b) Find the value of b.

.....

(2)

(Total for Question 24 is 4 marks)

25



The graph is a straight line passing through O.
The point A (30, 36) lies on the straight line.

Find the coordinates of all the points that

are on this straight line

and are between O and A

and have both coordinates integers.

.....

(Total for Question 25 is 3 marks)

26 Solve

$$x^2 + y^2 = 1$$
$$2x + y = 2$$

.....

(Total for Question 26 is 7 marks)

TOTAL FOR PAPER IS 100 MARKS

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