

Write your name here

Surname

Other names

Centre Number

Candidate Number

**Edexcel GCSE**

# Methods in Mathematics

## Unit 2: Methods 2

**Higher Tier**

Practice 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  $\pi$  button, take the value of  $\pi$  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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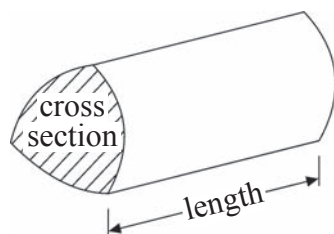
**PEARSON**

## GCSE Mathematics 2MM01

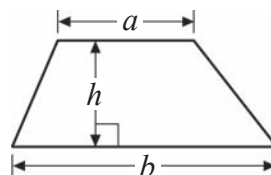
### Formulae – Higher Tier

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

**Volume of a prism** = area of cross section  $\times$  length

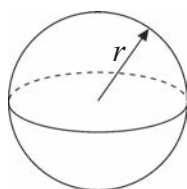


**Area of trapezium** =  $\frac{1}{2}(a + b)h$



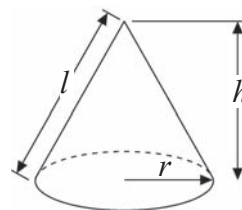
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

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

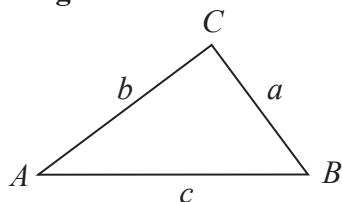


**Volume of cone** =  $\frac{1}{3}\pi r^2 h$

**Curved surface area of cone** =  $\pi r l$



**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 5 kg of apples costs £4.30  
Work out the cost of 7 kg of these apples.

£ .....

(Total for Question 1 is 2 marks)

- 2 Use your calculator to work out  $\frac{62.3 \times 8.94}{37.6 - 13.9}$

.....

(Total for Question 2 is 2 marks)

- 3  $x$  is an integer.

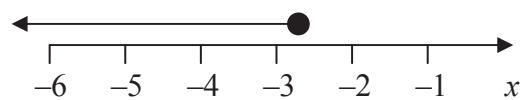
$$-1 \leq x < 4$$

- (a) Write down all the possible values of  $x$

.....

(2)

Here is a number line.



- (b) Write down the inequality shown on the number line.

.....

(1)

(Total for Question 3 is 3 marks)





\*4

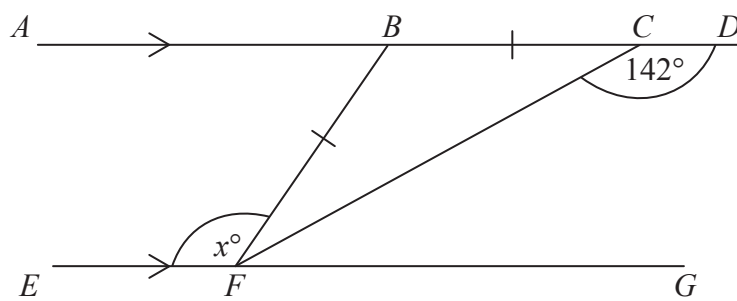


Diagram **NOT** accurately drawn

$AD$  is parallel to  $EG$ .

$BC = BF$ .

Angle  $FCD = 142^\circ$ .

Work out the size of the angle marked  $x^\circ$ .

Give reasons for your answer.

(Total for Question 4 is 4 marks)

5 Divide £200 in the ratio 3 : 5

(Total for Question 5 is 3 marks)



6

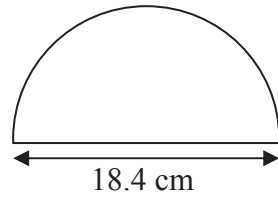


Diagram **NOT**  
accurately drawn

The semicircle has a diameter of 18.4 cm.  
Work out the perimeter of the semicircle.  
Give your answer correct to 1 decimal place.

.....

**(Total for Question 6 is 4 marks)**

7 (a) Increase £820 by 35%

£ .....

(3)

(b) Write 56 as a percentage of 64

..... %

(2)

(c) Write these numbers in order of size.  
Start with the smallest number.

0.35     $0.3\dot{4}$      $\frac{1}{3}$     33.4%

.....

(2)

**(Total for Question 7 is 7 marks)**



8  $M = 5p - 2r$   
 $p = 5.8$   
 $r = 3.7$

(a) Work out the value of  $M$ .

$M = \dots\dots\dots$   
 (2)

$W = 3x^2 - 5x$   
 $x = -8$

(c) Work out the value of  $W$ .

$W = \dots\dots\dots$   
 (2)

(c) Make  $c$  the subject of the formula  $f = 3c - t$

$\dots\dots\dots$   
 (2)

(Total for Question 8 is 6 marks)

9

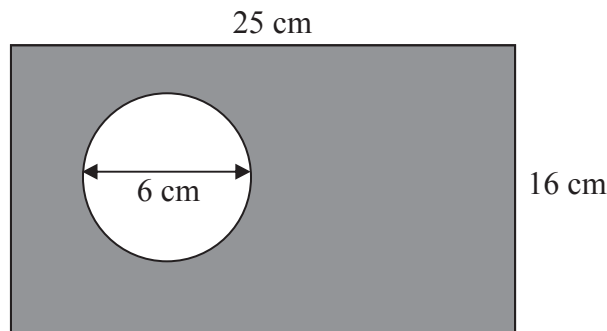


Diagram **NOT** accurately drawn

The rectangle has length 25 cm and width 16 cm.  
 The circle has diameter 6 cm.

Work out the shaded area.  
 Give your answer correct to 3 significant figures.

$\dots\dots\dots$  cm<sup>2</sup>

(Total for Question 9 is 4 marks)



10 The diagram shows a rectangle.

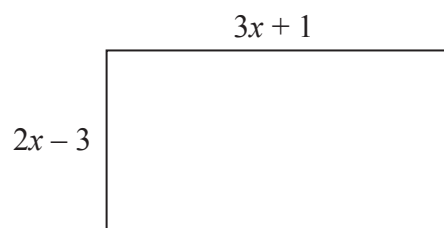


Diagram **NOT**  
accurately drawn

All measurements on the diagram are in centimetres.

The perimeter of the rectangle is less than 55 cm.

(a) Show that  $10x - 4 < 55$

(3)

$x$  is an integer.

(b) Find the greatest possible value of  $x$ .

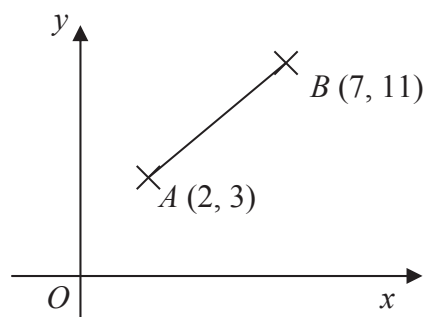
.....  
(3)

**(Total for Question 10 is 6 marks)**

11  $A$  is the point  $(2, 3)$ .  
 $B$  is the point  $(7, 11)$ .

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

Diagram **NOT**  
accurately drawn



.....  
**(Total for Question 11 is 3 marks)**



12

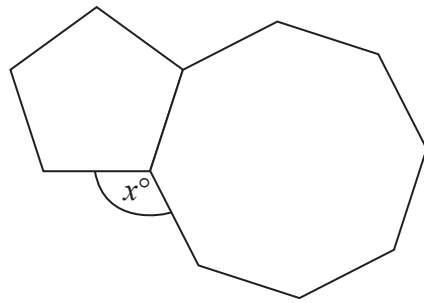


Diagram **NOT**  
accurately drawn

The diagram shows a regular pentagon and a regular octagon.

Work out the value of  $x$ .

$x = \dots\dots\dots^\circ$

**(Total for Question 12 is 4 marks)**

13 Solve the simultaneous equations

$$\begin{aligned}4a - 3b &= 24 \\7a + 2b &= 13\end{aligned}$$

$a = \dots\dots\dots$

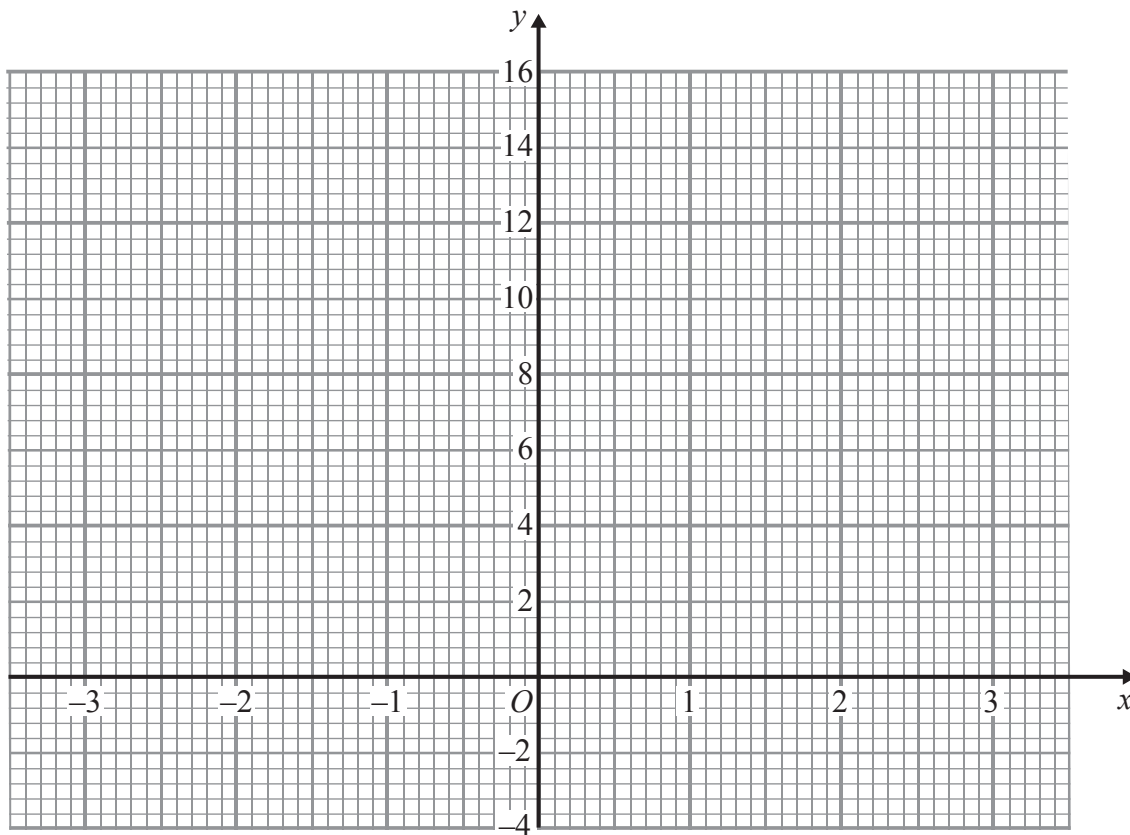
$b = \dots\dots\dots$

**(Total for Question 13 is 4 marks)**





14 On the grid, draw the graph of  $y = 2x^2 - 3$  for values of  $x$  from  $-3$  to  $3$



(Total for Question 14 is 4 marks)

15 When a number is increased by 35% the answer is 243

Work out the number.

(Total for Question 15 is 3 marks)



16 (a) (i) Write the number 56800000000 in standard form.

.....

(ii) Write  $9.034 \times 10^{-2}$  as an ordinary number.

.....

(2)

(b)  $m^2 = \frac{e-f}{ef}$

$e = 6 \times 10^6$

$f = 5 \times 10^5$

Work out the value of  $m$ .

Give your answer in standard form correct to 2 significant figures.

.....

(3)

(Total for Question 16 is 5 marks)



17 Make  $k$  the subject of the formula  $f = \sqrt{\frac{4-k}{k+3}}$

$k = \dots\dots\dots$

**(Total for Question 17 is 4 marks)**

18 A straight line, **L**, is perpendicular to the line with equation  $y = 4x - 1$   
**L** passes through the point (8, 1).

Find an equation of the straight line **L**.

$\dots\dots\dots$

**(Total for Question 18 is 3 marks)**



19 Here is a right-angled triangle.

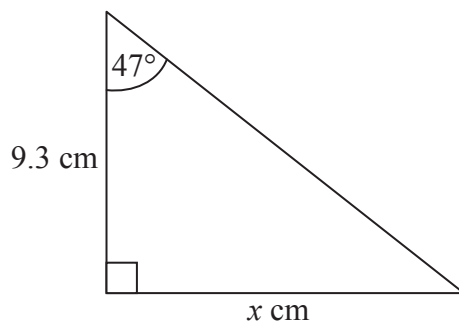


Diagram **NOT**  
accurately drawn

- (a) Calculate the value of  $x$ .  
Give your answer correct to 3 significant figures.

$x = \dots\dots\dots$   
(3)

Here is another right-angled triangle.

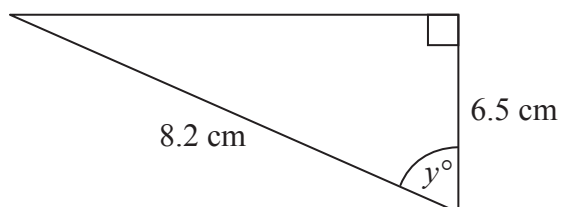


Diagram **NOT**  
accurately drawn

- (b) Calculate the size of the angle marked  $y$ .  
Give your answer correct to 1 decimal place.

$y = \dots\dots\dots^\circ$   
(3)

(Total for Question 19 is 6 marks)



20 The diagram shows a solid shape.

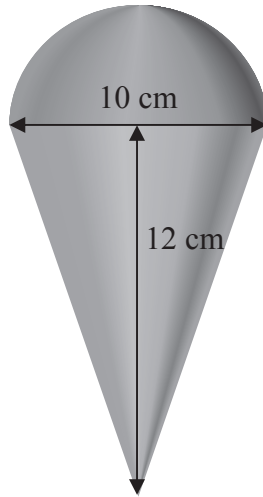


Diagram **NOT** accurately drawn

The shape is a hemisphere on top of a cone.

The cone has a diameter of 10 cm and a height of 12 cm.

The hemisphere has a diameter of 10 cm.

Work out the total surface area of the shape.

Give your answer correct to 3 significant figures.

..... cm<sup>2</sup>

(Total for Question 20 is 5 marks)



21 Prove that the recurring decimal  $0.5\dot{6}\dot{7}$  can be written as  $\frac{281}{495}$

---

(Total for Question 21 is 3 marks)

22 Solve  $3x^2 - x - 6 = 0$

Give your solutions correct to 2 decimal places.

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(Total for Question 22 is 3 marks)



\*23 Prove that the sum of any 3 consecutive even numbers is always a multiple of 6

(Total for Question 23 is 3 marks)

\*24 The diagram shows a quadrilateral.

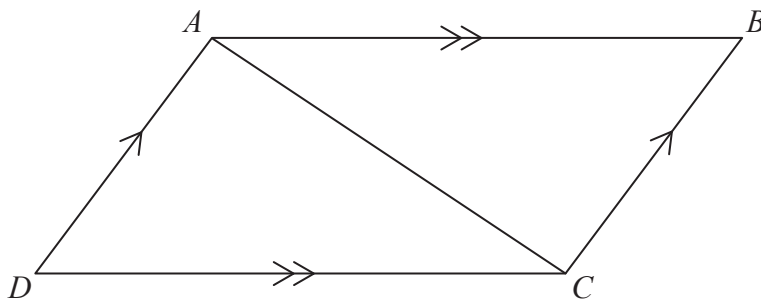


Diagram **NOT**  
accurately drawn

$AB$  is parallel to  $DC$ .  
 $AD$  is parallel to  $BC$ .

Prove that triangle  $ABC$  is congruent to triangle  $CDA$ .

(Total for Question 24 is 3 marks)



25

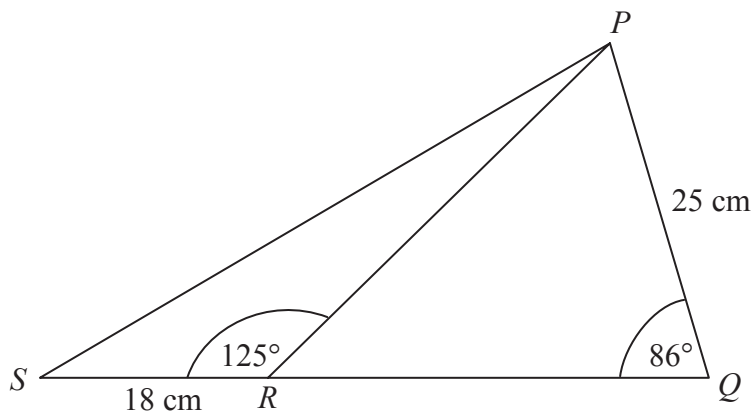


Diagram **NOT**  
accurately drawn

$SPQ$  is a triangle.  
 $PQ = 25$  cm.  
 $SR = 18$  cm.  
Angle  $SRP = 125^\circ$ .  
Angle  $PQR = 86^\circ$ .

Work out the length of  $SP$ .  
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 25 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS

