

Write your name here

Surname

Other names

**Pearson**  
**Edexcel GCSE**

Centre Number

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Candidate Number

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# Methods in Mathematics

## Unit 2: Methods 2

*For Approved Pilot Centres ONLY*

**Higher Tier**

Thursday 19 June 2014 – Morning

**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.

### 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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5/5/6/6/C2/



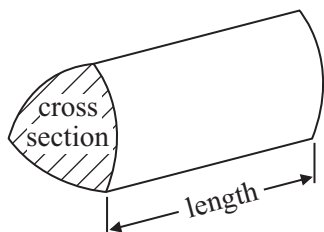
**PEARSON**

## GCSE Mathematics 2MM01

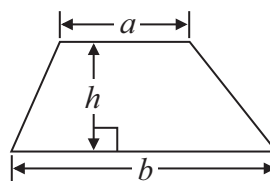
Formulae: Higher Tier

**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  $\times$  length

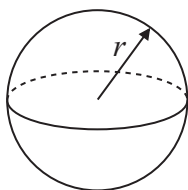


**Area of trapezium** =  $\frac{1}{2} (a + b)h$



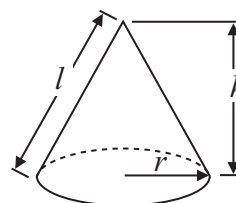
**Volume of sphere** =  $\frac{4}{3} \pi r^3$

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

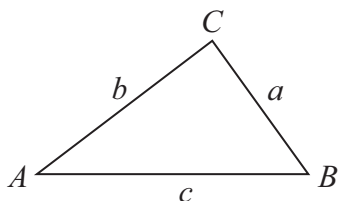


**Volume of cone** =  $\frac{1}{3} \pi r^2 h$

**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** The total weight of 55 identical items is 2.75 kg.

Work out the total weight of 22 of these identical items.

..... kg

**(Total for Question 1 is 2 marks)**

**2** (a) Increase 614 by 18%.

.....  
(2)

(b) Write 36 as a percentage of 48

..... %  
(2)

**(Total for Question 2 is 4 marks)**



- 3 (a) Use your calculator to work out  $\sqrt{5 + 1.7^3}$

Write down all the figures on your calculator display.

.....  
(1)

- (b) Use your calculator to work out  $\frac{16.7 \times 4.5}{7.83^2 + 2.9}$

Write down all the figures on your calculator display.

.....  
(2)

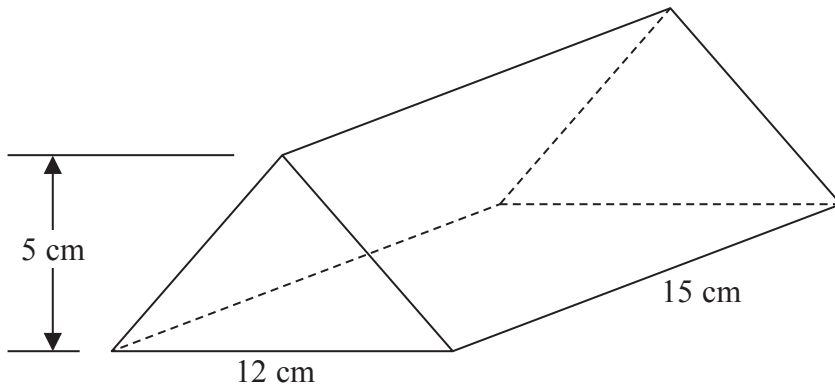
**(Total for Question 3 is 3 marks)**

---



4 Here is a solid triangular prism.

Diagram **NOT**  
accurately drawn



Work out the volume of this prism.

.....  
(Total for Question 4 is 3 marks)



5 Peter has  $x$  counters.

Lia has 7 more counters than Peter.

Soraya has 3 times as many counters as Peter.

The total number of counters is  $T$ .

Write a formula for  $T$  in terms of  $x$ .

---

(Total for Question 5 is 3 marks)

\*6 Which of these has the largest value?

- the reciprocal of 2.9
- or the square root of 0.12
- or the cube of 0.7

Show how you got your answer.

---

(Total for Question 6 is 3 marks)



7 Here is a 6-sided polygon.

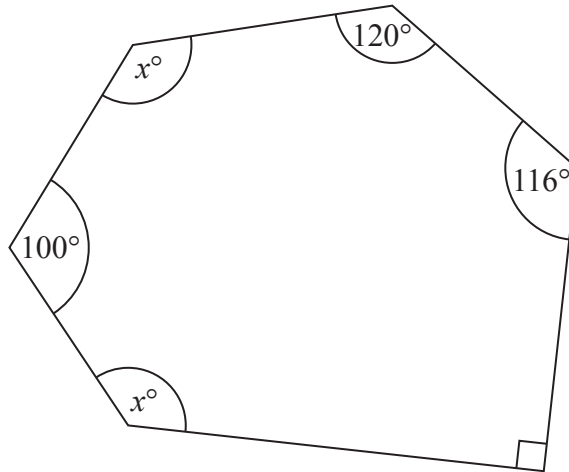


Diagram **NOT** accurately drawn

Work out the value of  $x$ .

.....  
**(Total for Question 7 is 4 marks)**

8 A circle has a circumference of 54 cm.

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

..... cm  
**(Total for Question 8 is 2 marks)**



9 Beth has 600 counters.

$\frac{3}{5}$  of the counters are yellow.

25% of the counters are red.

The rest of the counters are green.

Beth is given some more red counters.

Now the ratio of the number of green counters to the number of red counters is 1 : 2

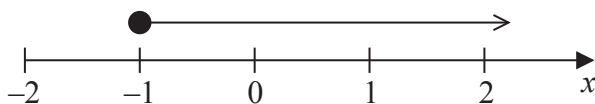
How many red counters was Beth given?

.....  
**(Total for Question 9 is 4 marks)**





10 Here is a number line.



(a) Write down the inequality shown on the number line.

.....  
(1)

$p$  is an integer.

$$-5 < p \leq -2$$

(b) Write down all the possible values of  $p$ .

.....  
(2)

(c) Solve  $5y - 2 < 18$

.....  
(2)

(Total for Question 10 is 5 marks)

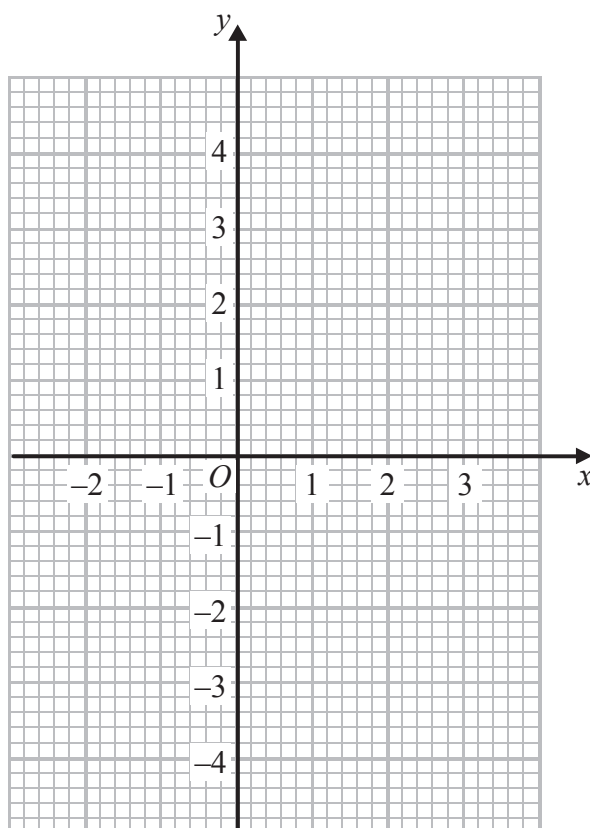


11 (a) Complete the table of values for  $y = x^2 - x - 3$

$x$	-2	-1	0	1	2	3
$y$		-1		-3	-1	

(2)

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



(2)

(c) Use your graph to find estimates for the solutions of  $x^2 - x - 3 = 0$

(2)

**(Total for Question 11 is 6 marks)**



12 £360 is shared in the ratio 1 : 3 : 5

Work out the difference between the largest share and the smallest share.

£ .....

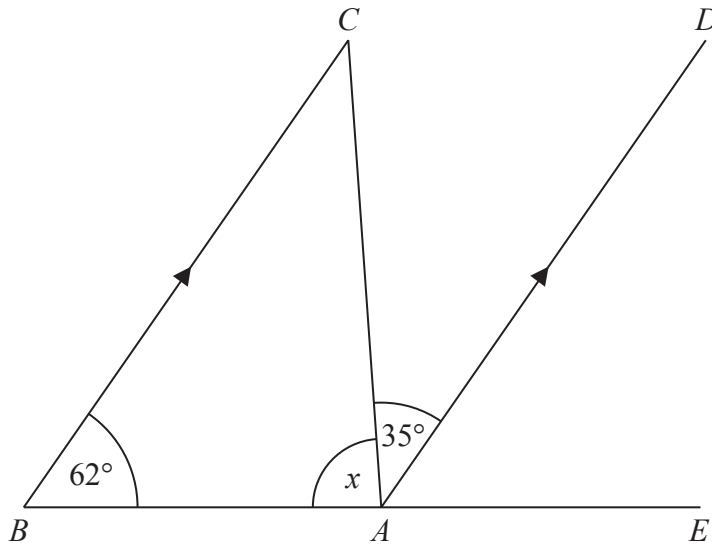
**(Total for Question 12 is 3 marks)**

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\*13

Diagram **NOT**  
accurately drawn



*ABC* is a triangle.  
*BC* is parallel to *AD*.  
*BAE* is a straight line.

Work out the size of the angle marked *x*.  
You must give reasons for your answer.

(Total for Question 13 is 4 marks)



14 (a) Make  $e$  the subject of the formula  $f = 5e - 3$

.....  
(2)

(b) Make  $g$  the subject of the formula  $h = \frac{g}{c} + d$

.....  
(2)

**(Total for Question 14 is 4 marks)**

---



15 £8000 gets 4% compound interest for 3 years.

Work out the amount of money at the end of 3 years.

£ .....

---

**(Total for Question 15 is 3 marks)**

16 A number is increased by 25% to get 5950

What is the number?

.....

---

**(Total for Question 16 is 3 marks)**



17

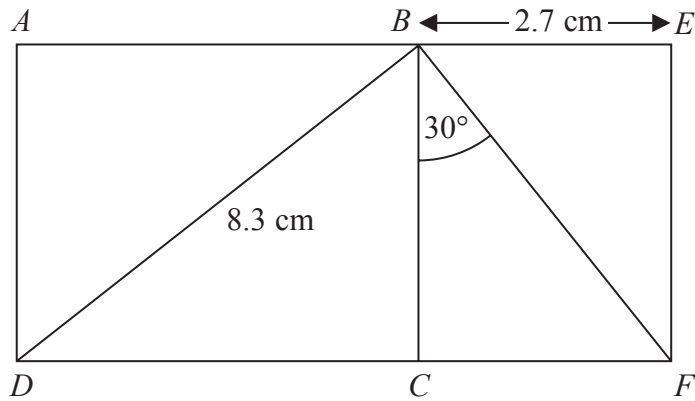


Diagram **NOT** accurately drawn

$ABCD$  and  $BEFC$  are rectangles.

$$BD = 8.3 \text{ cm}$$

$$BE = 2.7 \text{ cm}$$

$$\text{Angle } CBF = 30^\circ$$

Work out the size of angle  $BDC$ .

Give your answer correct to one decimal place.

(Total for Question 17 is 5 marks)



18 Solve the simultaneous equations

$$4x - 3y = 11$$

$$6x + 2y = -3$$

$x =$  .....

$y =$  .....

**(Total for Question 18 is 4 marks)**

---





\*19

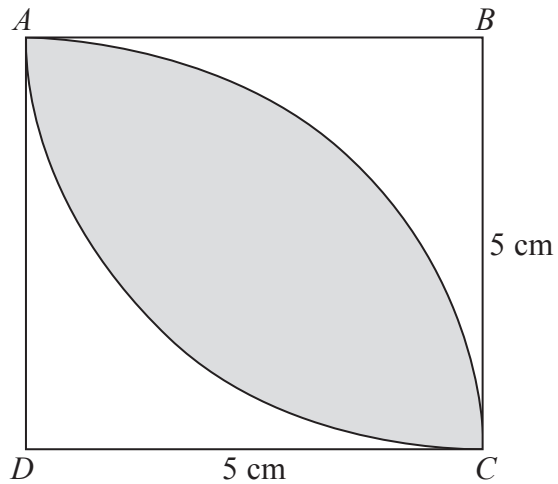


Diagram **NOT**  
accurately drawn

$ABCD$  is a square of side 5 cm.

$BAC$  is a sector of a circle centre  $B$ .

$DAC$  is a sector of a circle centre  $D$ .

Is the area of the shaded region greater than the area of the region that is **not** shaded?

(Total for Question 19 is 5 marks)



P 4 3 4 0 4 A 0 1 7 2 4

**20** A straight line has equation  $y = 3x + 1$

The straight line  $L$  is parallel to the line with equation  $y = 3x + 1$   
Line  $L$  passes through the point  $(2, 10)$ .

Find an equation of the line  $L$ .

---

(Total for Question 20 is 3 marks)

---

**\*21** Prove algebraically that the recurring decimal  $0.4\dot{3}$  can be written as the fraction  $\frac{13}{30}$

---

(Total for Question 21 is 3 marks)

---



**22**  $y$  is inversely proportional to the square of  $x$ .

$$y = 4 \text{ when } x = 3$$

Find the value of  $y$  when  $x = 10$

.....  
**(Total for Question 22 is 4 marks)**

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23  $ABC$  is a triangle.

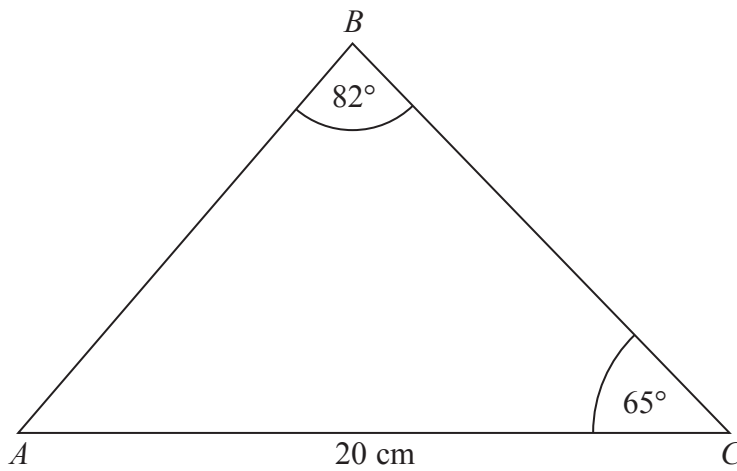


Diagram **NOT**  
accurately drawn

$$AC = 20 \text{ cm}$$

$$\text{Angle } ACB = 65^\circ$$

$$\text{Angle } ABC = 82^\circ$$

Calculate the length of  $AB$ .

Give your answer correct to 3 significant figures.

..... cm

(Total for Question 23 is 3 marks)



24 The diagram shows a solid shape made from a cone on top of a cylinder.

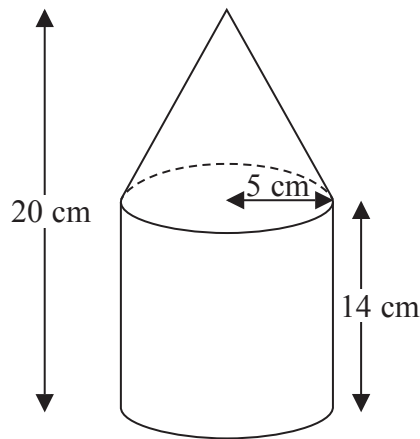


Diagram **NOT** accurately drawn

The radius of the cylinder is 5 cm.  
The radius of the base of the cone is 5 cm.

The height of the cylinder is 14 cm.  
The height of the solid shape is 20 cm.

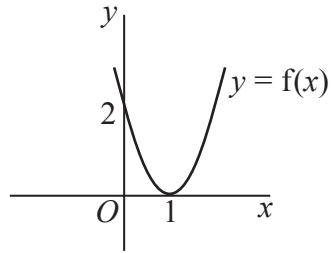
Work out the total surface area of the solid shape.  
Give your answer correct to 3 significant figures.

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

(Total for Question 24 is 5 marks)

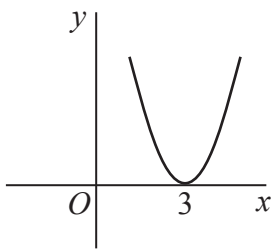


25 Here is the graph of  $y = f(x)$ .

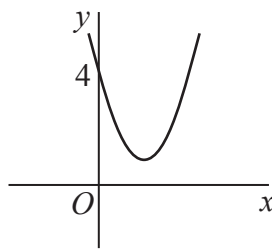


Each of the graphs **A**, **B**, **C**, **D**, **E** and **F** is a transformation of the graph of  $y = f(x)$ .

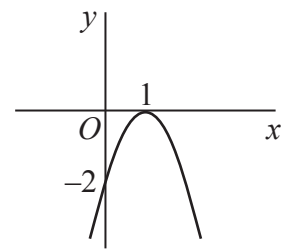
Graph **A**



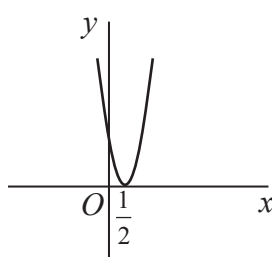
Graph **B**



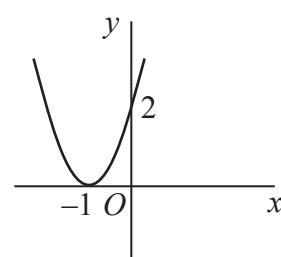
Graph **C**



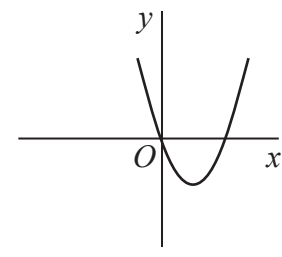
Graph **D**



Graph **E**



Graph **F**



Match each of the graphs **A**, **B**, **C**, **D**, **E** and **F** to its equation in the table.

Equation	Graph
$y = f(x) + 2$	
$y = f(-x)$	
$y = f(2x)$	
$y = -f(x)$	
$y = f(x - 2)$	
$y = f(x) - 2$	

(Total for Question 25 is 3 marks)



26 The diagram shows a trapezium.

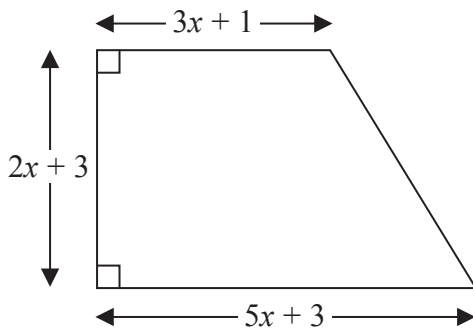


Diagram **NOT**  
accurately drawn

All the measurements are in centimetres.

The area of the trapezium is  $46 \text{ cm}^2$ .

(a) Show that  $x^2 + 2x - 5 = 0$

(3)

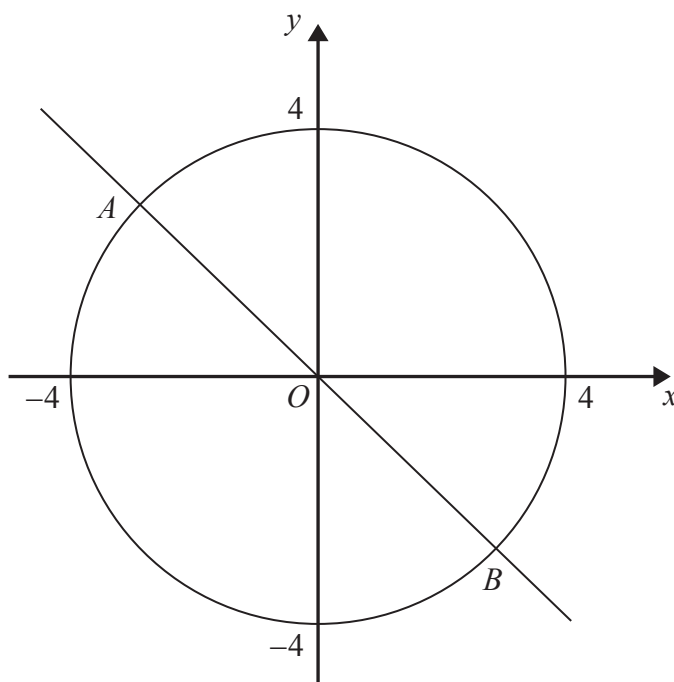
(b) Solve the equation  $x^2 + 2x - 5 = 0$   
Give your solutions correct to 2 decimal places.

(3)

(Total for Question 26 is 6 marks)



27 Here is a circle centre  $O$  and the line with equation  $y = -x$



(a) Write down the equation of the circle.

.....  
(1)

The line with equation  $y = -x$  meets the circle at the points  $A$  and  $B$ .

(b) Work out the  $x$ -coordinate of  $A$ .

.....  
(2)

(Total for Question 27 is 3 marks)

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**TOTAL FOR PAPER IS 100 MARKS**

