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 20 June 2013 – 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 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 ▶

P41235A

6/6/8/

P 4 1 2 3 5 A 0 1 2 4

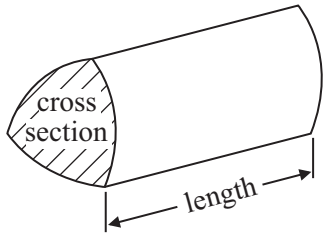
PEARSON

GCSE Mathematics 2MM01

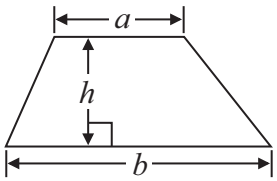
Formulae: Higher Tier

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

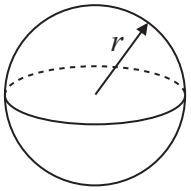


Area of trapezium = $\frac{1}{2}(a + b)h$



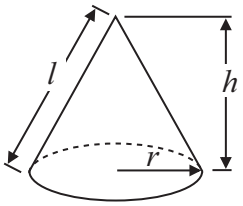
Volume of sphere = $\frac{4}{3}\pi r^3$

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

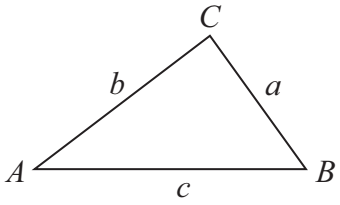


Volume of cone = $\frac{1}{3}\pi r^2 h$

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 Here is a solid cuboid.

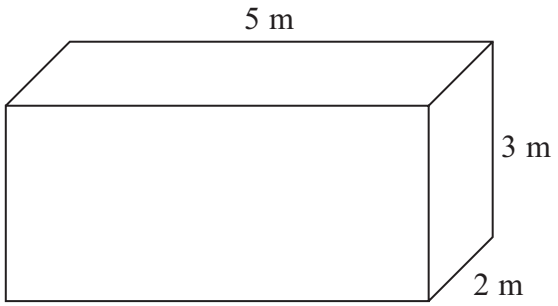


Diagram **NOT** accurately drawn

Work out the total surface area of this cuboid.

..... m^2

(Total for Question 1 is 3 marks)

2 8 cakes cost £11.60

Work out the cost of 12 cakes.

£.....

(Total for Question 2 is 2 marks)

3 (a) Increase 5 by 50%.

.....

(2)

(b) Decrease £320 by one eighth.

£ .....

(3)

(Total for Question 3 is 5 marks)

4 There are 20 counters in a bag.
14 of these counters are red.
6 of these counters are blue.

(a) Write down the ratio of the number of red counters to the number of blue counters.
Give your ratio in its simplest form.

.....

(2)

5 counters are taken from the bag.
The ratio of the number of red counters to the number of blue counters is now 4 : 1

(b) How many red counters were taken from the bag?

.....

(3)

(Total for Question 4 is 5 marks)

***5**

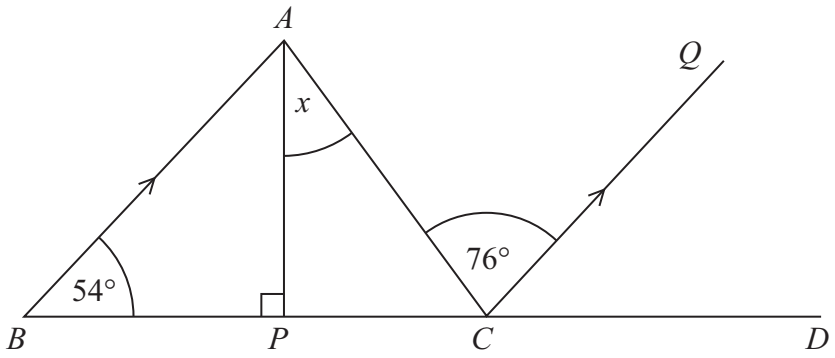


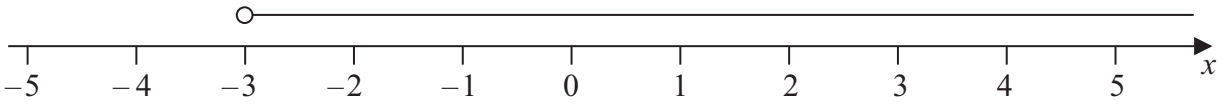
Diagram **NOT** accurately drawn

BPCD is a straight line.
BA is parallel to *CQ*.
AP is perpendicular to *BC*.
Angle *ABC* = 54°
Angle *ACQ* = 76°

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

(Total for Question 5 is 4 marks)

6 Here is a number line.

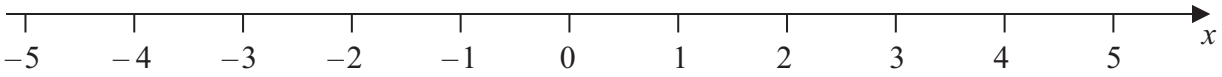


(a) Write down the inequality shown on the number line.

.....

(1)

Here is a number line.



(b) On this number line, show the inequality $-1 \leqslant x < 3$

(2)

(c) Solve $2p + 3 > 11$

.....

(2)

(Total for Question 6 is 5 marks)

7 Here is a rectangle.

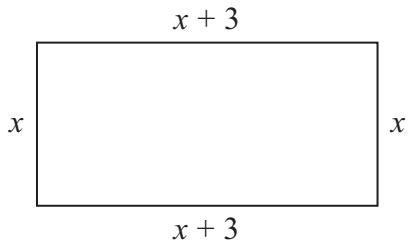


Diagram **NOT** accurately drawn

All measurements are in centimetres.

D cm is the total length of the four sides.

(a) Show that $D = 4x + 6$

(2)

(b) Make x the subject of the formula $D = 4x + 6$

.....

(2)

(Total for Question 7 is 4 marks)

8 $T = 3x - 2y$

$x = 5$
$y = -4$

(a) Work out the value of T.

.....

(2)

$W = c^3$

$c = -2$

(b) Work out the value of W.

.....

(1)

$s = \frac{1}{2}at^2$

$a = 9.8$

$t = 6$

(c) Work out the value of s.

.....

(2)

(Total for Question 8 is 5 marks)

9 The value of x is greater than 12

(a) Write down an inequality for x.

.....

(1)

The value of y is less than or equal to 20

(b) Write down an inequality for y.

.....

(1)

(Total for Question 9 is 2 marks)

10 Here is a cylinder.

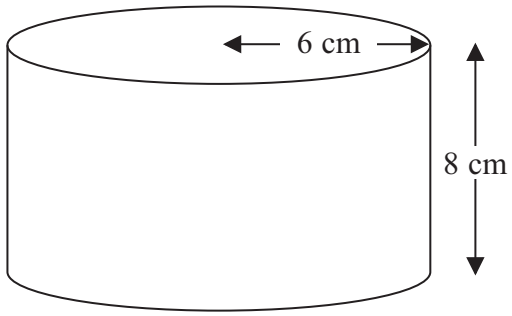


Diagram **NOT** accurately drawn

The formula to find the volume, V, of a cylinder is $V = \pi r^2 h$

The radius, r, of the cylinder is 6 cm.
The height, h, of the cylinder is 8 cm.

(a) Work out the volume of the cylinder.
Give your answer correct to 3 significant figures.

.....cm^3

(2)

(b) Work out the area of the curved surface of the cylinder.
Give your answer correct to 3 significant figures.

.....

(4)

(Total for Question 10 is 6 marks)

11 Here is a right-angled triangle.

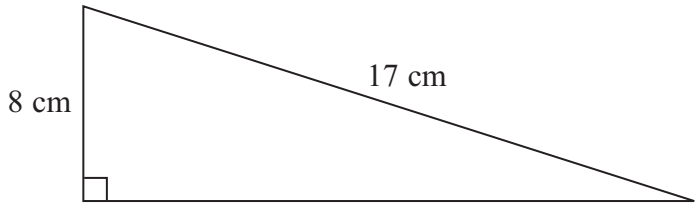


Diagram **NOT** accurately drawn

Work out the area of the triangle.

.....cm^2

(Total for Question 11 is 4 marks)

12 A number is decreased by 15%.
The result is 323

What was the original number?

.....

(Total for Question 12 is 3 marks)

13

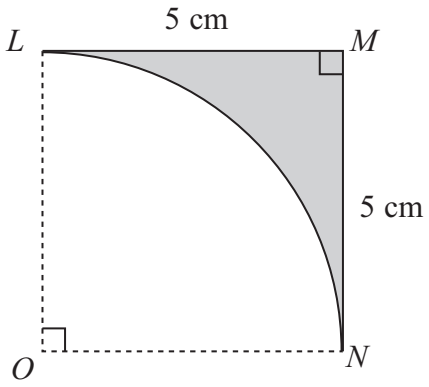


Diagram **NOT** accurately drawn

The arc LN is a quarter of a circle of radius 5 cm, centre O.

Find the perimeter of the shaded shape.
Give your answer correct to 2 decimal places.

.....cm

(Total for Question 13 is 3 marks)

14 (a) Work out $\sqrt{1 - 0.45^2}$

Give your answer as a decimal correct to 3 decimal places.

.....

(2)

(b) Find the value of $(5.0625)^{\frac{1}{4}}$

.....

(1)

(Total for Question 14 is 3 marks)

---

15 Here is a right-angled triangle.

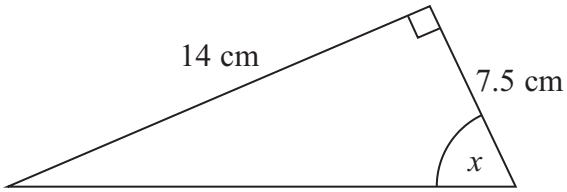


Diagram **NOT** accurately drawn

Work out the size of the angle marked x.
Give your answer to the nearest degree.

.....°

(Total for Question 15 is 3 marks)

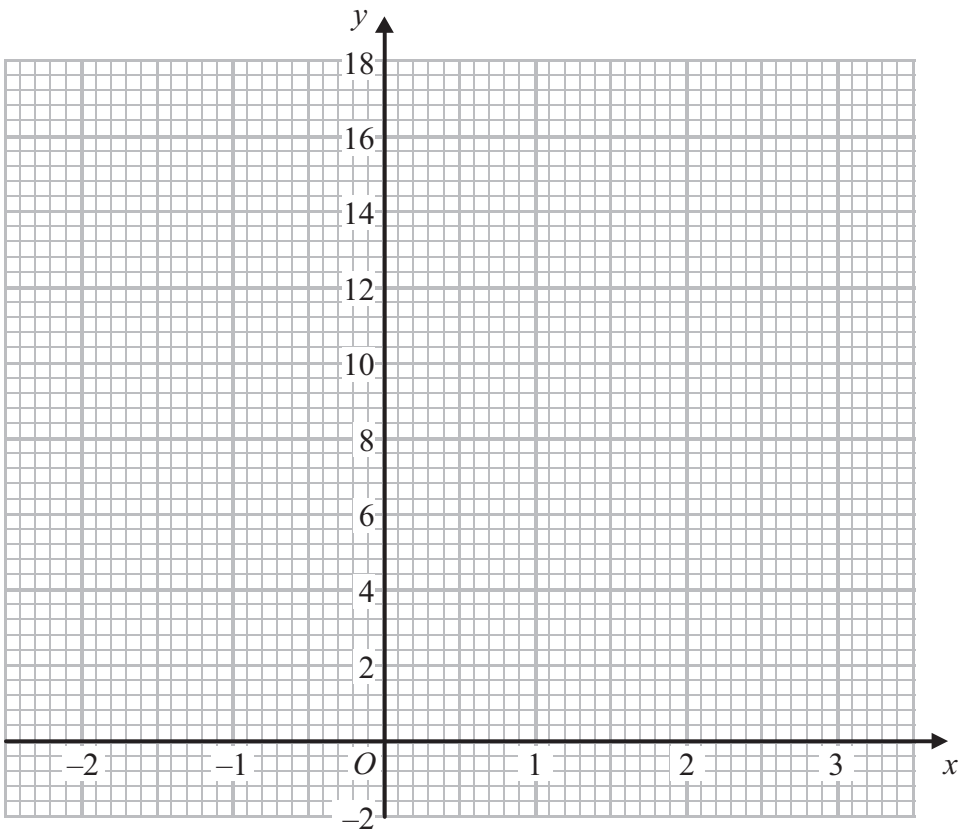
---

16 (a) Complete this table of values for $y = 2x^2 - x$

x	–2	–1	0	1	2	3
y		3	0		6	

(2)

(b) On the grid, draw the graph of $y = 2x^2 - x$ for values of x from −2 to 3



(2)

(c) Solve the equation $2x^2 - x - 3 = 0$

.....

(2)

(Total for Question 16 is 6 marks)

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

$$3x + 2y = 9$$
$$2x - 3y = 19$$

x = ...

y = ...

(Total for Question 17 is 4 marks)

18 T is directly proportional to d.

When $d = 6$, $T = 27$

Work out the value of d when $T = 11.25$

.....

(Total for Question 18 is 3 marks)

19 Jenny invested £10 000 at a compound interest rate of 3.5% per annum.
At the end of n years the value of this investment is £V.

(a) Work out the value of V when $n = 2$

$V =$ .....

(3)

(b) Write down a formula for V in terms of n.

.....

(2)

(c) Work out the least value of n when the value of V is greater than 15 000

.....

(2)

(Total for Question 19 is 7 marks)

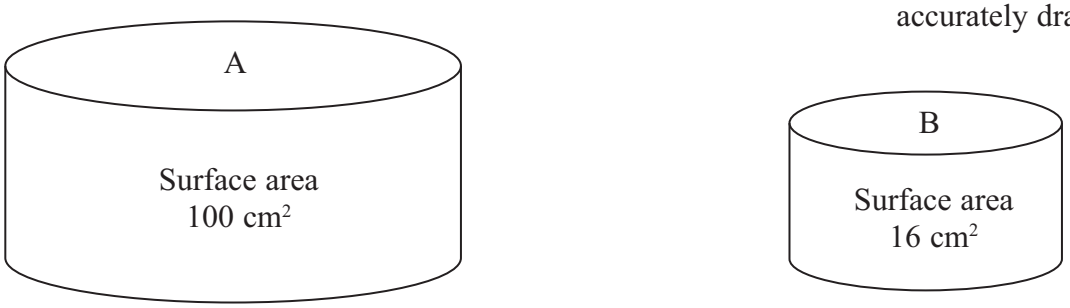
***20** $x = 0.0\dot{1}\dot{5}$

Prove algebraically that x can be written as $\frac{1}{66}$

(Total for Question 20 is 3 marks)

21 The diagram shows two similar solid cylinders made from the same metal.

Diagram **NOT** accurately drawn



The surface area of A = 100 cm^2
The surface area of B = 16 cm^2

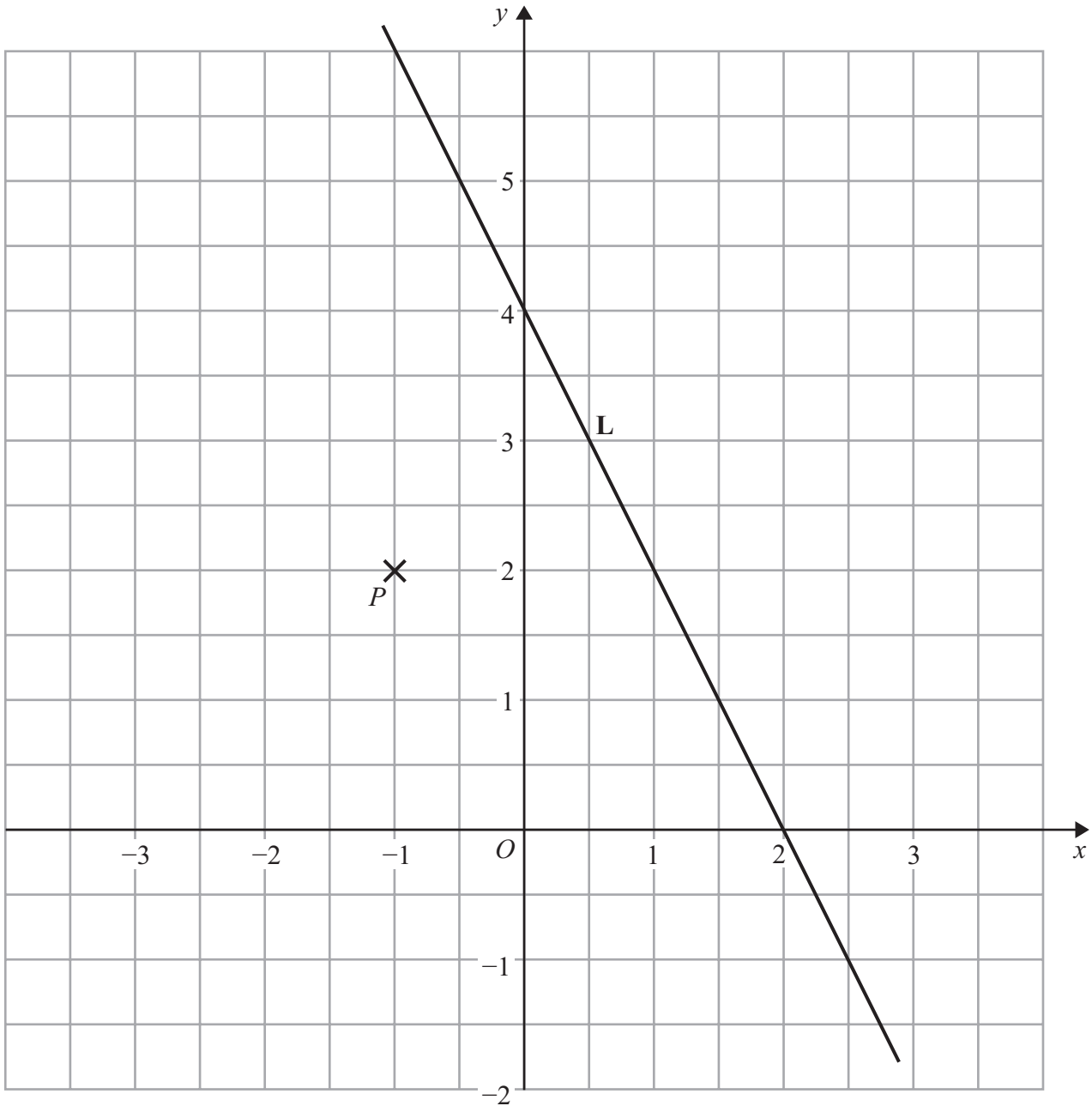
The mass of B is 1.2 kg.

Work out the mass of A.

.....kg

(Total for Question 21 is 4 marks)

22 The straight line **L** is drawn on the grid.



(a) Find an equation of **L**.

.....

(3)

P is the point with coordinates $(-1, 2)$.

(b) (i) Find an equation of the straight line that is parallel to **L** and passes through P.

.....

(ii) Find an equation of the straight line that is perpendicular to **L** and passes through P.

.....

(4)

(Total for Question 22 is 7 marks)

***23** Prove algebraically that the product of two odd numbers is **always** an odd number.

(Total for Question 23 is 3 marks)

Turn over for Question 24

24 *ABC* is an isosceles triangle.

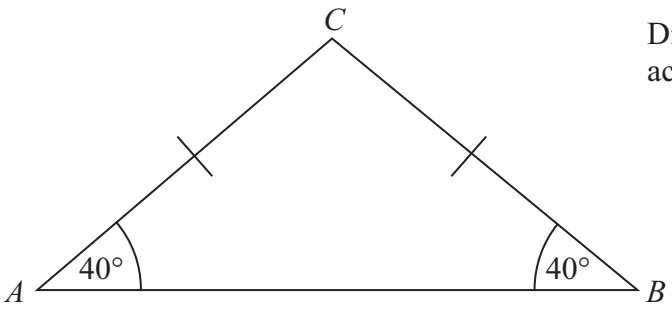


Diagram **NOT** accurately drawn

The area of this isosceles triangle is 25 cm^2.

Work out the length of each side of the triangle.
Give your answers correct to 3 significant figures.

.....

(Total for Question 24 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS

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