

Write your name here

Surname

Other names

Pearson
Edexcel GCSE

Centre Number

--	--	--	--	--

Candidate Number

--	--	--	--

Mathematics B

Unit 2: Number, Algebra, Geometry 1
(Non-Calculator)

Higher Tier

Friday 6 November 2015 – Morning

Time: 1 hour 15 minutes

Paper Reference

5MB2H/01

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. 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 must not be used.**



Information

- The total mark for this paper is 60
- 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 ►

P45903A

©2015 Pearson Education Ltd.

6/6/6/



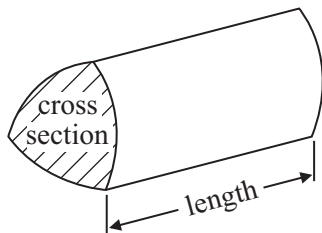
PEARSON

GCSE Mathematics 2MB01

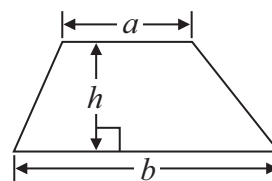
Formulae: Higher Tier

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

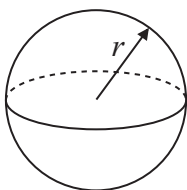


Area of trapezium = $\frac{1}{2} (a + b)h$



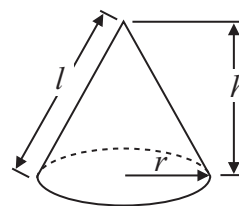
Volume of sphere = $\frac{4}{3} \pi r^3$

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

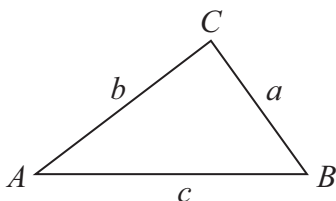


Volume of cone = $\frac{1}{3} \pi r^2 h$

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.

You must NOT use a calculator.

- 1** Here are the ingredients needed to make leek and potato soup for 4 people.

Leek and potato soup
Serves 4
4 leeks
350 g potatoes
600 ml vegetable stock
300 ml milk

Jenny wants to make soup for 6 people.

Work out the amount of each ingredient she needs.

..... leeks

..... g potatoes

..... ml vegetable stock

..... ml milk

(Total for Question 1 is 3 marks)



P 4 5 9 0 3 A 0 3 2 0

2 Here is an equilateral triangle.

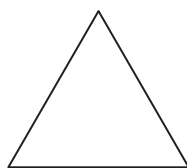
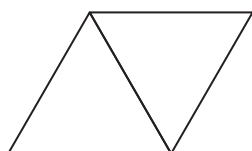


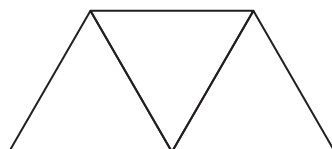
Diagram **NOT**
accurately drawn

The equilateral triangle has a perimeter of 24 cm.

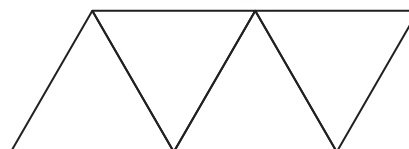
Some of these equilateral triangles are used to make this sequence of quadrilaterals.



quadrilateral 1



quadrilateral 2



quadrilateral 3

Find an expression for the perimeter, in centimetres, of quadrilateral n .

(Total for Question 2 is 3 marks)



- 3 The diagram shows the area of each of three faces of a cuboid.

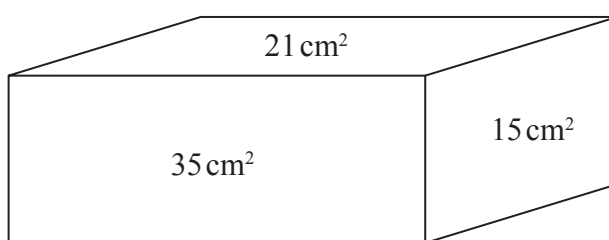


Diagram **NOT**
accurately drawn

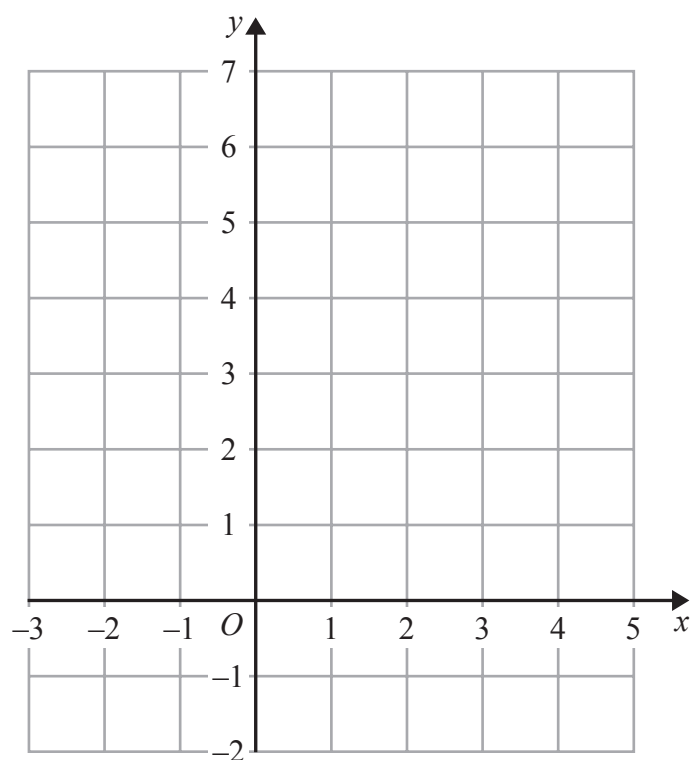
The length of each edge of the cuboid is a whole number of centimetres.

Work out the volume of the cuboid.

(Total for Question 3 is 4 marks)



- 4 On the grid, draw the graph of $y = \frac{1}{2}x + 3$ for values of x from -2 to 4



(Total for Question 4 is 3 marks)



- 5 Andy is going to cover a wall with tiles.

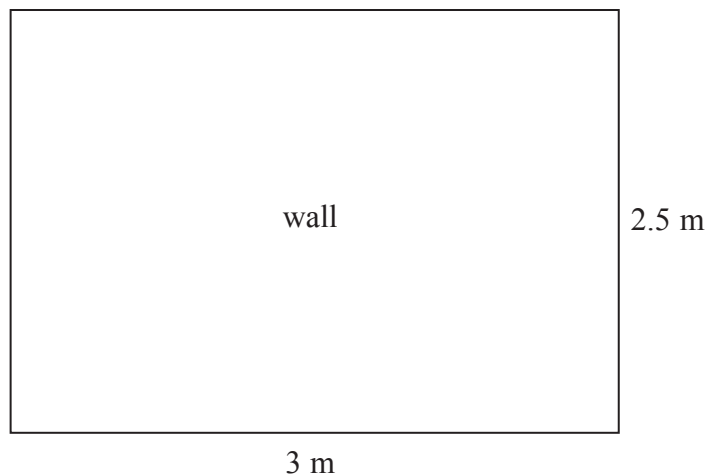


Diagram **NOT**
accurately drawn

The wall is in the shape of a rectangle.
The wall is 3 m wide and 2.5 m high.
The tiles are rectangles 20 cm wide and 25 cm high.

The tiles are sold in boxes.
There are 20 tiles in each box.
Each box of tiles costs £8.50

Work out the total cost of the boxes of tiles Andy needs to buy.
You must show all your working.

£

(Total for Question 5 is 5 marks)



- *6 The n th term of sequence A is $3n - 2$
The n th term of sequence B is $10 - 2n$

Sally says there is only one number that is in both sequence A and sequence B.

Is Sally right?

You must explain your answer.

(Total for Question 6 is 2 marks)



7 Tom and Amy set the alarms on their phones to sound at 6.45 am.

Both alarms sound together at 6.45 am.

Tom's alarm then sounds every 9 minutes.

Amy's alarm then sounds every 12 minutes.

At what time will both alarms next sound together?

.....
(Total for Question 7 is 3 marks)



8 (a) Factorise $12e + 4$

.....
(1)

(b) Expand $5(3c - 2d)$

.....
(1)

(c) Simplify $7a^3b^{-2} \times 4ab^5$

.....
(2)

(d) Factorise $x^2 - 49$

.....
(1)

(e) Expand and simplify $(2y + 7)(y - 3)$

.....
(2)

(Total for Question 8 is 7 marks)



*9 The diagram shows a pentagon $ABCDE$.

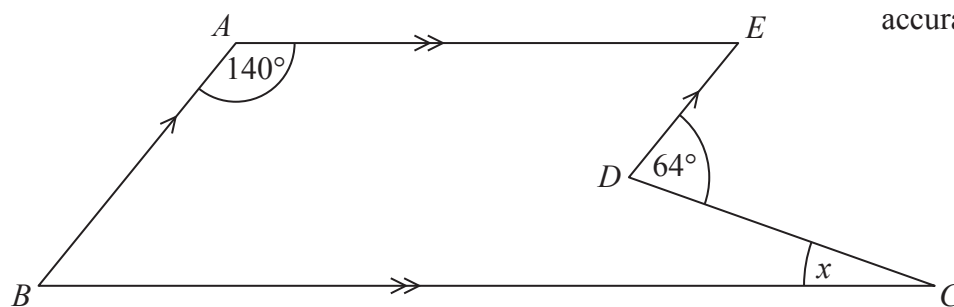


Diagram **NOT**
accurately drawn

AE is parallel to BC .

BA is parallel to DE .

Angle $EDC = 64^\circ$

Angle $BAE = 140^\circ$

Work out the size of the angle marked x .

You must give reasons for your answer.

(Total for Question 9 is 4 marks)



10 Work out $3\frac{4}{5} + \frac{3}{7}$

Give your answer as a mixed number in its simplest form.

(Total for Question 10 is 3 marks)

11 (a) Write 0.0078 in standard form.

(1)

(b) Write 6.71×10^6 as an ordinary number.

(1)

(c) Write these numbers in order of size.

Start with the smallest number.

$$9^{\frac{1}{2}}$$

$$0.9$$

$$-9$$

$$9^0$$

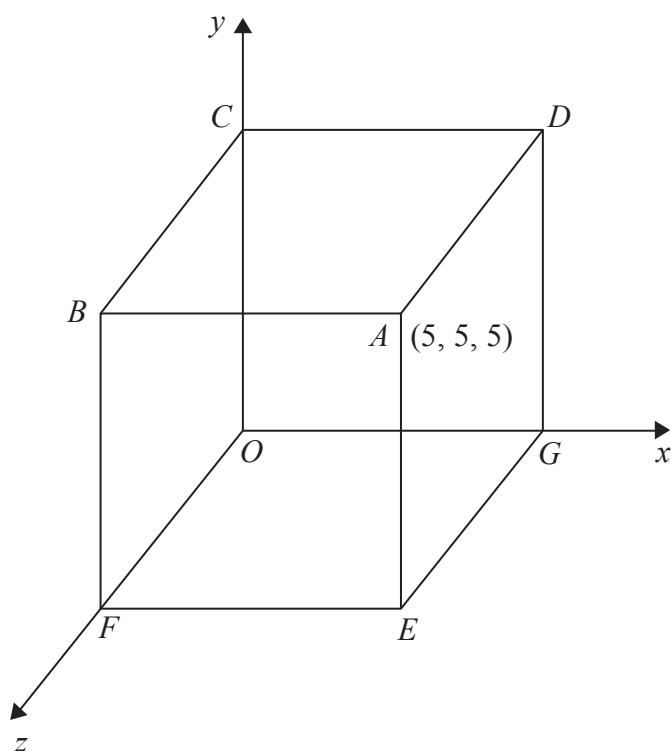
(2)

(Total for Question 11 is 4 marks)



12 The diagram shows a cube drawn on a 3-D grid.

Diagram **NOT**
accurately drawn



The coordinates of vertex A are $(5, 5, 5)$.

(a) Write down the coordinates of vertex B .

(..... , ,)
(1)

(b) Work out the coordinates of the midpoint of AC .

(..... , ,)
(1)

(Total for Question 12 is 2 marks)



13 Kristen buys a laptop.

She gets a discount of 20% off the normal price.

Kristen pays £480 for the laptop.

Work out the discount.

Give your answer in pounds.

£

(Total for Question 13 is 3 marks)



14

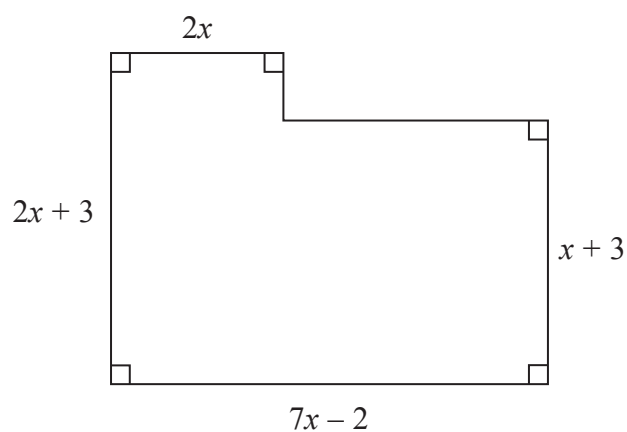


Diagram **NOT**
accurately drawn

All the measurements in the diagram are in centimetres.

The area of the shape is $A \text{ cm}^2$.

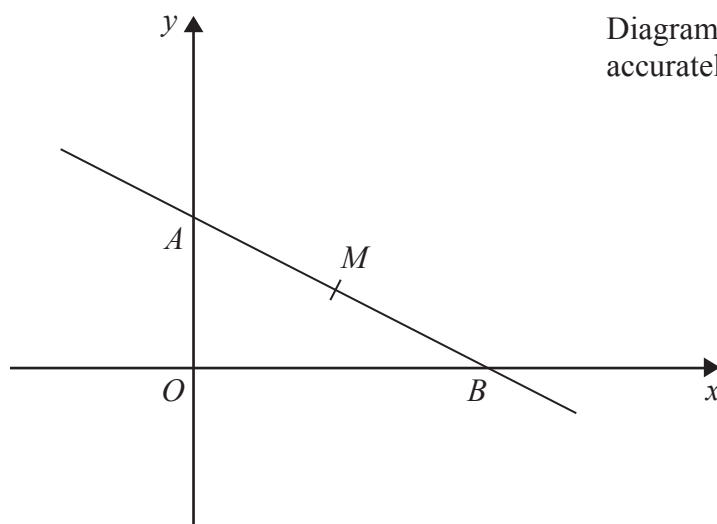
Find a formula for A in terms of x .

You must write your formula as simply as possible.

(Total for Question 14 is 4 marks)



15

Diagram **NOT**
accurately drawn

In the diagram A is the point $(0, 4)$
 B is the point $(6, 0)$

M is the midpoint of AB .

Find an equation of the line that passes through M and is perpendicular to AB .

(Total for Question 15 is 4 marks)



16 Rationalise the denominator of $\frac{(4 + \sqrt{2})(4 - \sqrt{2})}{\sqrt{7}}$

Give your answer in its simplest form.

(Total for Question 16 is 3 marks)

17 Simplify fully $\frac{x^2 - 2x - 15}{2x^2 + 7x + 3}$

(Total for Question 17 is 3 marks)

TOTAL FOR PAPER IS 60 MARKS



BLANK PAGE



BLANK PAGE



BLANK PAGE

