

Write your name here

Surname

Other names

Centre Number

Candidate Number

**Edexcel GCSE**

# Mathematics B

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

**Higher Tier**

Wednesday 13 June 2012 – 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 ►

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6/6/7



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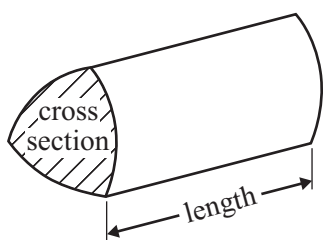
**PEARSON**

## GCSE Mathematics 2MB01

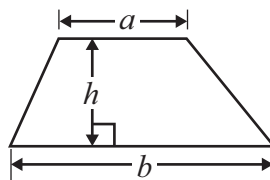
Formulae: Higher Tier

**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

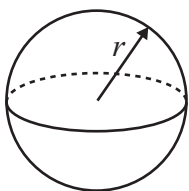


**Area of trapezium** =  $\frac{1}{2}(a + b)h$



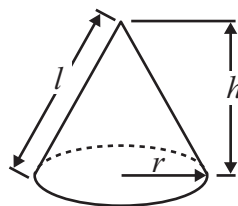
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

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

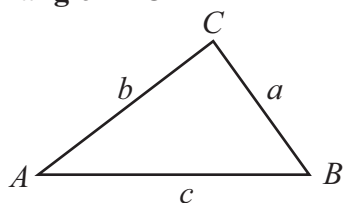


**Volume of cone** =  $\frac{1}{3}\pi r^2 h$

**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

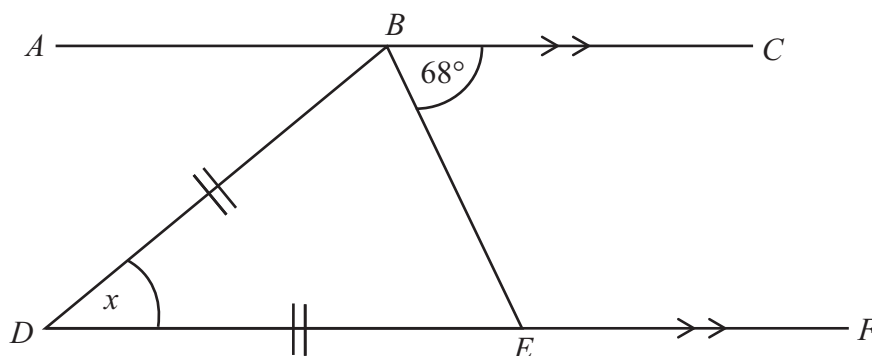


Diagram NOT  
accurately drawn

$BDE$  is an isosceles triangle.

$DB = DE$ .

The straight line  $ABC$  is parallel to the straight line  $DEF$ .

Work out the size of the angle marked  $x$ .

You must give reasons for each stage in your working.

(Total for Question 1 is 4 marks)



- 2 Here are the first four terms of a number sequence.

6      10      14      18

Write an expression, in terms of  $n$ , for the  $n$ th term of this sequence.

.....  
(Total for Question 2 is 2 marks)

- 3 Graham and Michael share £35 in the ratio 5 : 2

Work out the amount of money that Graham gets.

£ .....

(Total for Question 3 is 2 marks)

- 4 Work out  $\frac{2}{5} + \frac{3}{8}$

Give your answer in its simplest form.

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



- 5 A TV costs £400  
Peter pays a deposit of 15%.

How much does Peter still have to pay for the TV?



£ .....

**(Total for Question 5 is 3 marks)**

- 6 (a) Factorise  $10a + 5$

.....  
(1)

- (b) Expand and simplify  $5(x + 7) + 3(x - 2)$

.....  
(2)


- (c) Factorise completely  $3a^2b + 6ab^2$

.....  
(2)

**(Total for Question 6 is 5 marks)**



7 Here is part of Jo's electricity bill.

Electricity Bill		May 2012
J. Evans 3 Hillside Ave London		
<b>2012</b>		CP Energy Connecting people Connecting places
Reading 1st Jan	02792 units	
Reading 1st April	03307 units	
Number of units used	515 units	
Cost: 35p per unit		

Work out how much Jo has to pay for the units she has used.

£ .....

(Total for Question 7 is 4 marks)



8 The diagram shows a triangular prism.

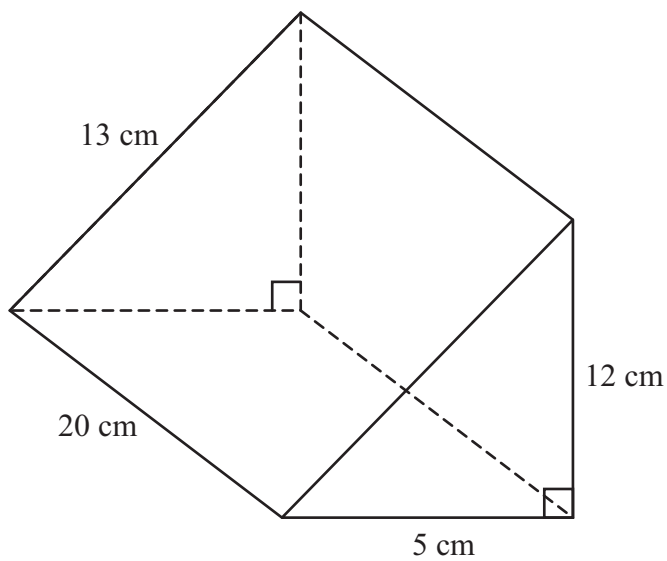


Diagram **NOT** accurately drawn

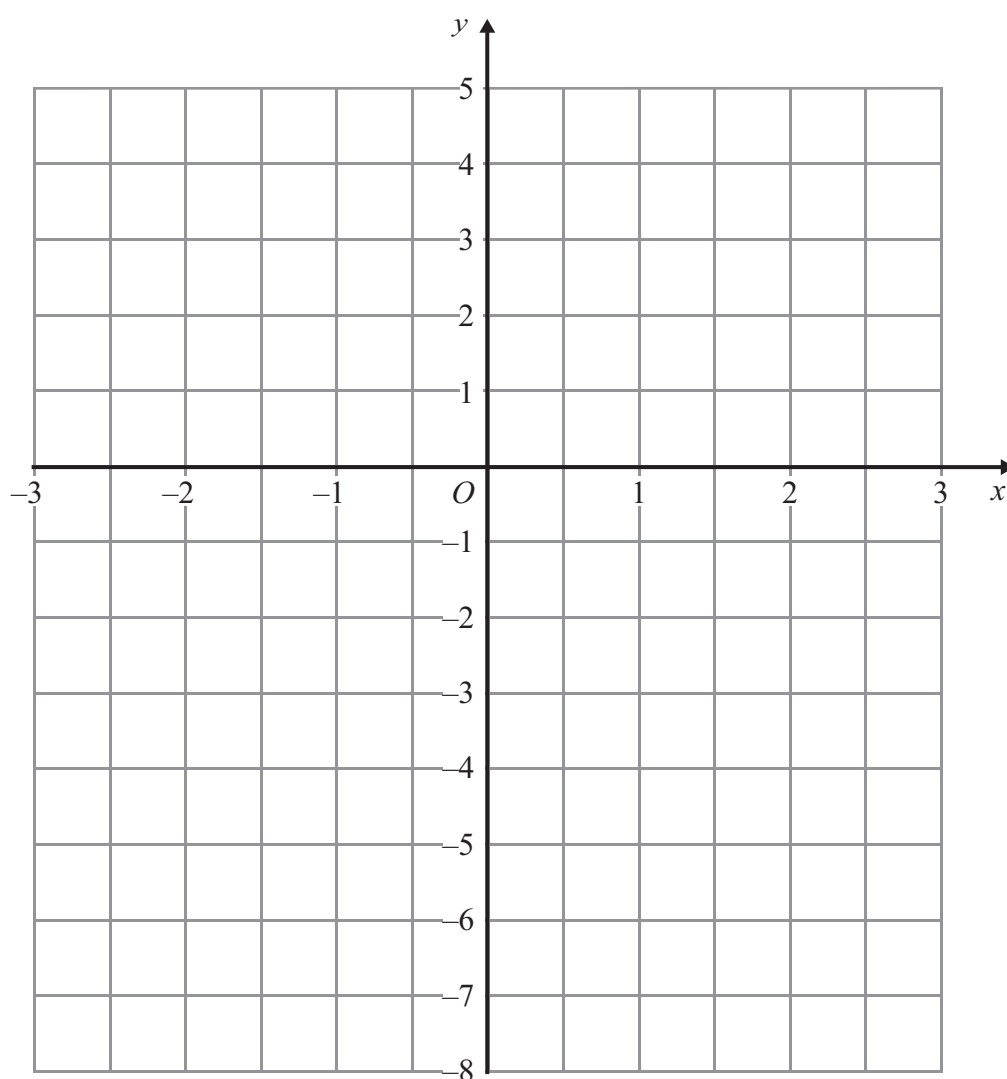
Work out the total surface area of the prism.

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

**(Total for Question 8 is 3 marks)**



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



(Total for Question 9 is 3 marks)





- 10 Janice cuts a triangle from a rectangular piece of metal. She uses the rest of the metal to make a name badge.

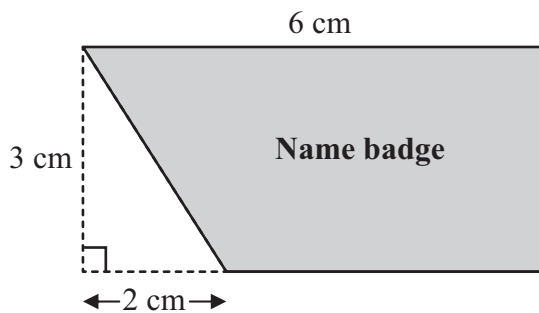


Diagram **NOT**  
accurately drawn

The rectangle has length 6 cm and width 3 cm.  
The right-angled triangle has base 2 cm and height 3 cm.

Work out the area of the name badge.

.....  
(Total for Question 10 is 4 marks)



11 Danny bought a car for £10 000

The value of the car depreciated by 20% in the first year.  
Then the value of the car depreciated by 10% in the second year.

Work out the value of Danny's car at the end of two years.

£.....

(Total for Question 11 is 3 marks)

12 (a) Expand and simplify  $(x + 5)(x - 8)$

.....  
(2)

(b) Factorise  $x^2 - 16$

.....  
(1)

(Total for Question 12 is 3 marks)



13 The diagram shows a cuboid drawn on a 3-D coordinate grid.

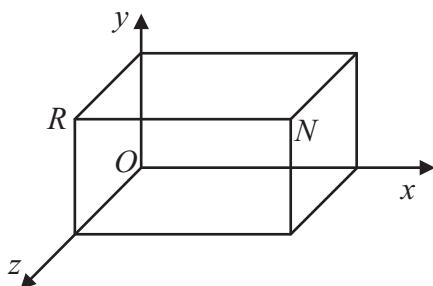


Diagram **NOT** accurately drawn

The vertex  $N$  of the cuboid has coordinates  $(6, 2, 4)$ .

(a) What are the coordinates of the vertex  $R$ ?

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

(b) What are the coordinates of the midpoint of the line segment  $RN$ ?

( ..... , ..... , ..... )  
(2)

(Total for Question 13 is 3 marks)

14 (a) Write the recurring decimal  $0.2\dot{5}$  as a fraction in its simplest form.

.....  
(3)

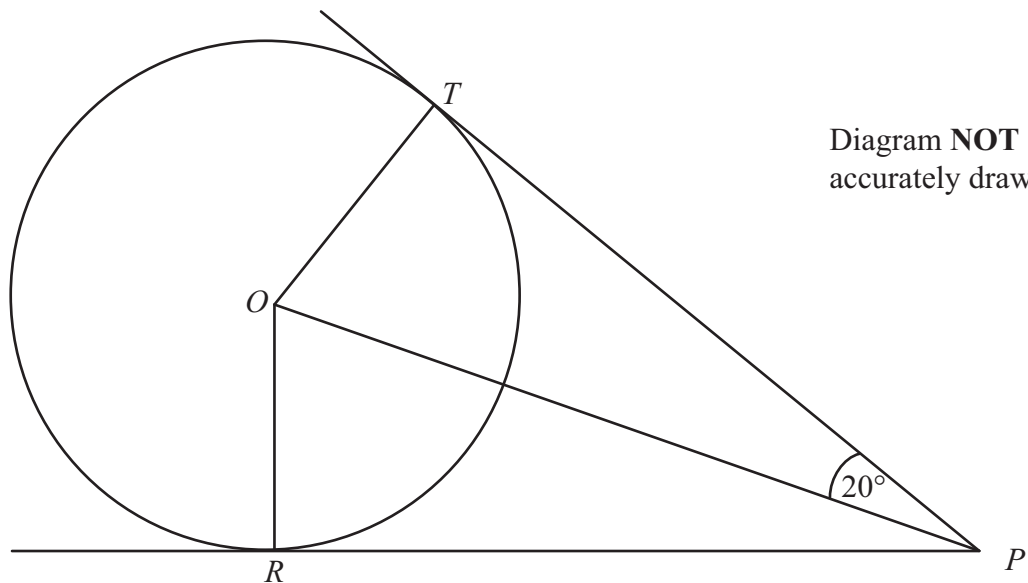
(b) Rationalise the denominator of  $\frac{12}{\sqrt{6}}$   
Give your answer in its simplest form.

.....  
(2)

(Total for Question 14 is 5 marks)



\*15



$T$  and  $R$  are two points on a circle centre  $O$ .

$PT$  and  $PR$  are the tangents to the circle from  $P$ .

Angle  $TPO = 20^\circ$ .

Work out the size of angle  $TOR$ .

You must give reasons for each stage of your working.

(Total for Question 15 is 4 marks)



16 Judy drives at an average speed of 80 km per hour for 2 hours 45 minutes.

Work out the number of **miles** Judy drives.

..... miles

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

17 Find an equation of the straight line that is perpendicular to the straight line  $x + 2y = 5$  and that passes through the point (3, 7).

.....

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



18 Simplify completely  $\frac{2x^2 - 9x - 5}{4x^3 + 2x^2}$

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

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**TOTAL FOR PAPER IS 60 MARKS**



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