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

Tuesday 1 March 2011 – Afternoon
Time: 1 hour 15 minutes

Paper Reference
5MB2H/01

You must have:
Ruler graduated in centimetres and millimetres, protractor, 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
  – *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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6/6/6/6

P 3 8 9 7 7 A 0 1 1 6

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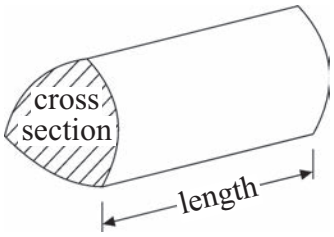
GCSE Mathematics 2MB01

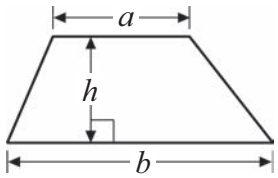
Formulae – Higher Tier

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

Volume of a prism = area of cross section × length

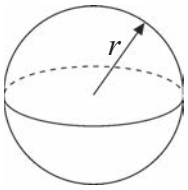


Area of trapezium $= \frac{1}{2}(a+b)h$



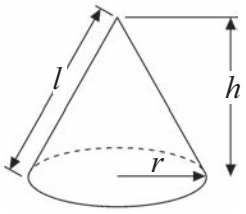
Volume of sphere $= \frac{4}{3}\pi r^3$

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

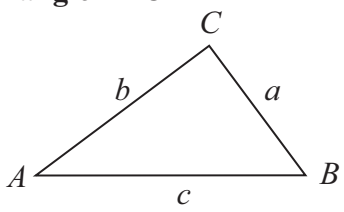


Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi rl$



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 are the first four terms of an arithmetic sequence.

5 9 13 17

(a) What is the next term of this sequence?

.....

(1)

(b) Write down an expression, in terms of n, for the nth term of the sequence.

.....

(2)

(Total for Question 1 is 3 marks)

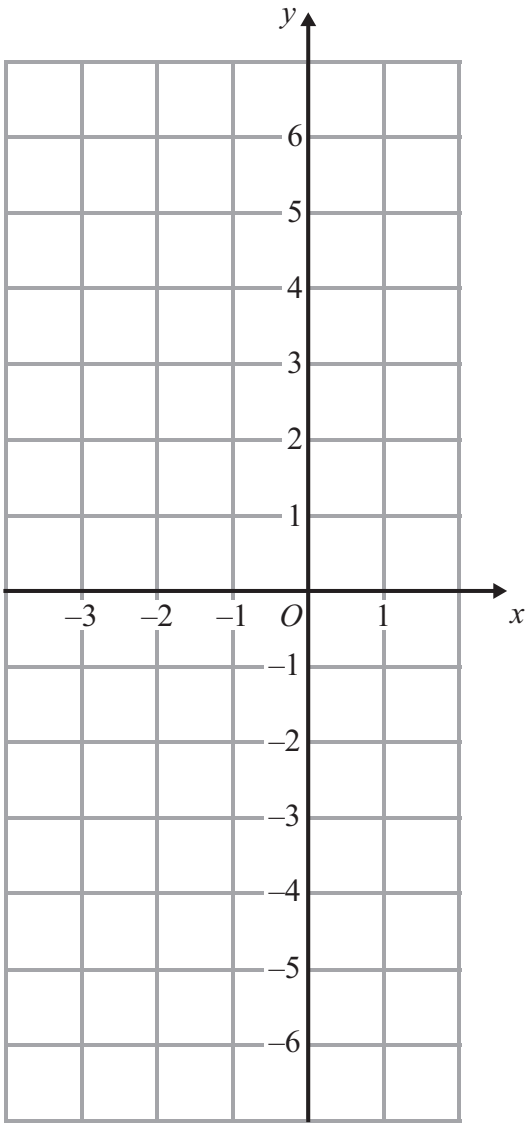
2 Ali, Ben and Candice share £300 in the ratio 2 : 3 : 5

How much money does Candice get?

£ .....

(Total for Question 2 is 2 marks)

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



(Total for Question 3 is 3 marks)

4 Veena bought some food for a barbecue.
She is going to make some hot dogs.
She needs a bread roll and a sausage for each hot dog.

There are 40 bread rolls in a pack.
There are 24 sausages in a pack.

Veena bought exactly the same number of bread rolls and sausages.

(i) How many packs of bread rolls and packs of sausages did she buy?

..... packs of bread rolls

..... packs of sausages

(ii) How many hot dogs can she make?

..... hot dogs

(Total for Question 4 is 5 marks)

5

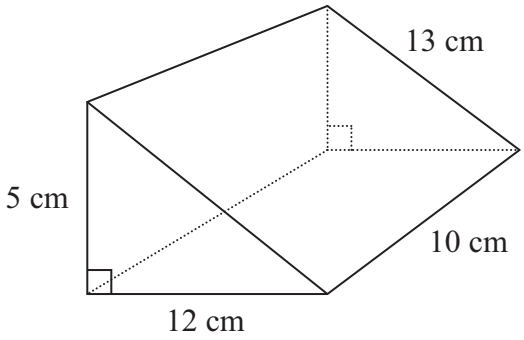


Diagram **NOT** accurately drawn.

Work out the total surface area of this triangular prism.

.....

(Total for Question 5 is 4 marks)

6 The interior angle of a regular polygon is 160°.

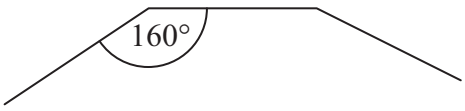


Diagram **NOT** accurately drawn.

(i) Write down the size of an exterior angle of the polygon.

..... °

(ii) Work out the number of sides of the polygon.

.....

(Total for Question 6 is 3 marks)

7 A piece of card is in the shape of a trapezium.

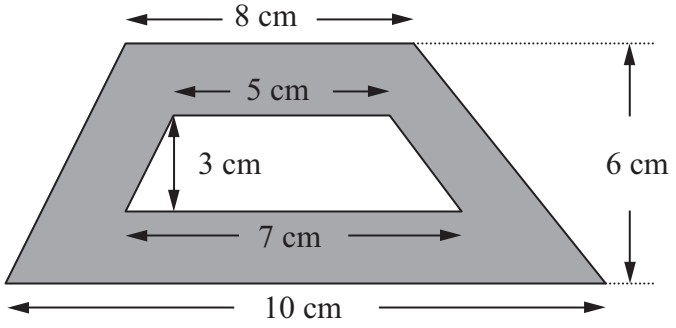


Diagram **NOT** accurately drawn.

A hole is cut in the card.
The hole is in the shape of a trapezium.

Work out the area of the shaded region.

..... cm^2

(Total for Question 7 is 3 marks)

8 The table shows the costs, per person, of a holiday at two different hotels.
It shows the cost for 5 nights and the cost for each extra night.
It also shows the discount for each child.

	Park Palace		**Dubai Grand**	
Date holiday starts	5 nights	extra night	5 nights	extra night
01 Jan – 31 Mar	£1169	£150	£849	£86
01 Apr – 09 Apr	£1229	£150	£1219	£95
10 Apr – 15 Jul	£810	£80	£853	£53
16 Jul – 20 Aug	£810	£80	£854	£53
21 Aug – 10 Dec	£810	£80	£869	£94
Discount for each child	$\frac{1}{5}$ off		15% off	

There are two adults and two children in the Smith family.
The family want a holiday for 7 nights, starting on 1st August.

One hotel will be cheaper for them than the other hotel.

Work out the cost of the cheaper holiday.
You must show all your working.

£ .....

(Total for Question 8 is 6 marks)

9 A plane takes 30 seconds to fly a distance of 8 kilometres.

Work out the average speed of the plane, in miles per hour.

..... miles per hour

(Total for Question 9 is 3 marks)

10 *AB* is a line segment.
A is the point (2, 5, 6).
The midpoint of the line *AB* has coordinates (–1, –4, 2).

Find the coordinates of point *B*.

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

(Total for Question 10 is 2 marks)

11 (a) Expand $3(x + 2)$

.....

(2)

(b) Factorise completely $12\ x^3y - 18\ xy^2$

.....

(2)

(c) Expand and simplify $(2x - 3)(x + 4)$

.....

(2)

(d) Simplify $5x^4y^3 \times 2x^3y^2$

.....

(2)

(Total for Question 11 is 8 marks)

12 Write down the value of

(i) 7^0

.....

(ii) 5^{-1}

.....

(iii) $9^{\frac{1}{2}}$

.....

(Total for Question 12 is 3 marks)

13 (a) Write down the equation of a straight line that is parallel to $y = 5x + 6$

.....

(1)

(b) Find an equation of the line that is perpendicular to the line $y = 5x + 6$ and passes through the point (–2, 5).

.....

(3)

(Total for Question 13 is 4 marks)

14 Simplify fully $\dfrac{x^2-2x-15}{x^2-4x-21}$

.....

(Total for Question 14 is 3 marks)

15

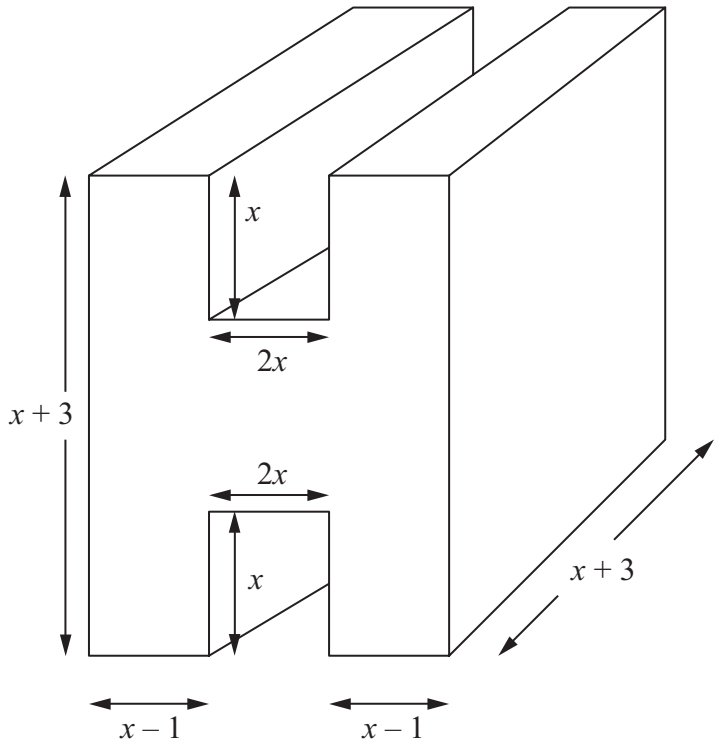


Diagram **NOT** accurately drawn.

The diagram shows a prism.
All measurements are in cm.
All corners are right angles.
The volume of the prism is V cm^3.

Find a formula for V.

$V =$ .....

(Total for Question 15 is 4 marks)

***16**

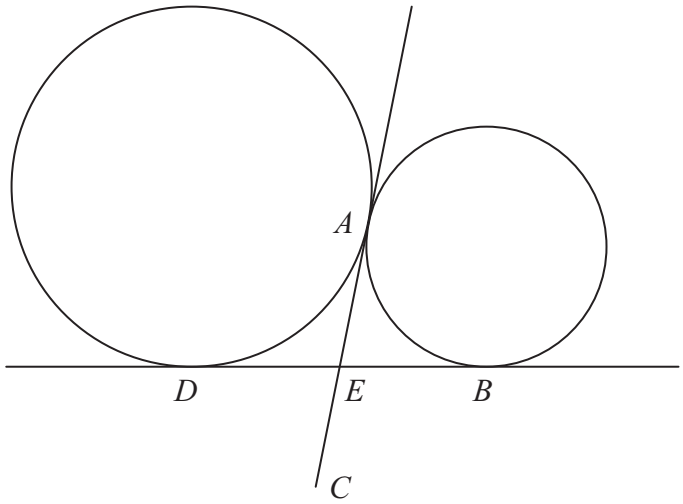


Diagram **NOT** accurately drawn.

A and *D* are two points on the circumference of a circle.
A and *B* are two points on the circumference of a smaller circle.
DB and *AC* are tangents to both circles.
E is the intersection of *DB* and *AC*.
E is the midpoint of *AC*.

Prove that *ABCD* is a rectangle.

(Total for Question 16 is 4 marks)

TOTAL FOR PAPER IS 60 MARKS

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