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 13 June 2014 – 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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P 4 3 4 0 9 A 0 1 1 6

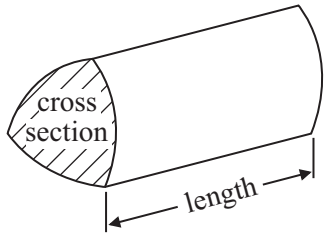
PEARSON

GCSE Mathematics 2MB01

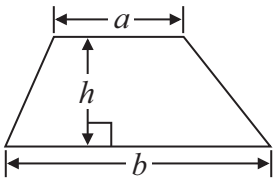
Formulae: Higher Tier

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 × length

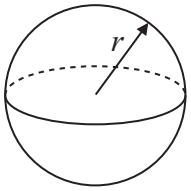


Area of trapezium = $\frac{1}{2}(a + b)h$



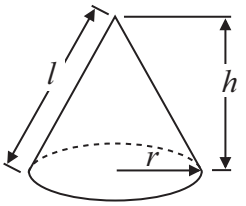
Volume of sphere = $\frac{4}{3}\pi r^3$

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

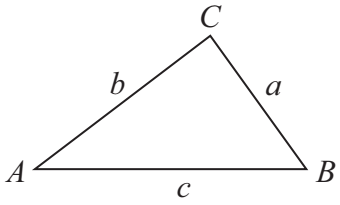


Volume of cone = $\frac{1}{3}\pi r^2 h$

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.

You must NOT use a calculator.

1 A set of tyres normally costs £500
In a sale there is a 30% discount.

Work out the sale price of the set of tyres.

£.....

(Total for Question 1 is 3 marks)

2 (a) Simplify $3e + 2f - e - 3f$

.....

(2)

(b) Expand $2(3x + 5)$

.....

(2)

(Total for Question 2 is 4 marks)

3 Here is a list of ingredients for making a peach dessert for **6** people.

Peach dessert for **6** people.	
150 g	jelly
10	sponge fingers
500 m*l*	custard
200 g	peaches

Bob is going to make a peach dessert for **15** people.

Work out the amount of each ingredient he needs.

..... g jelly

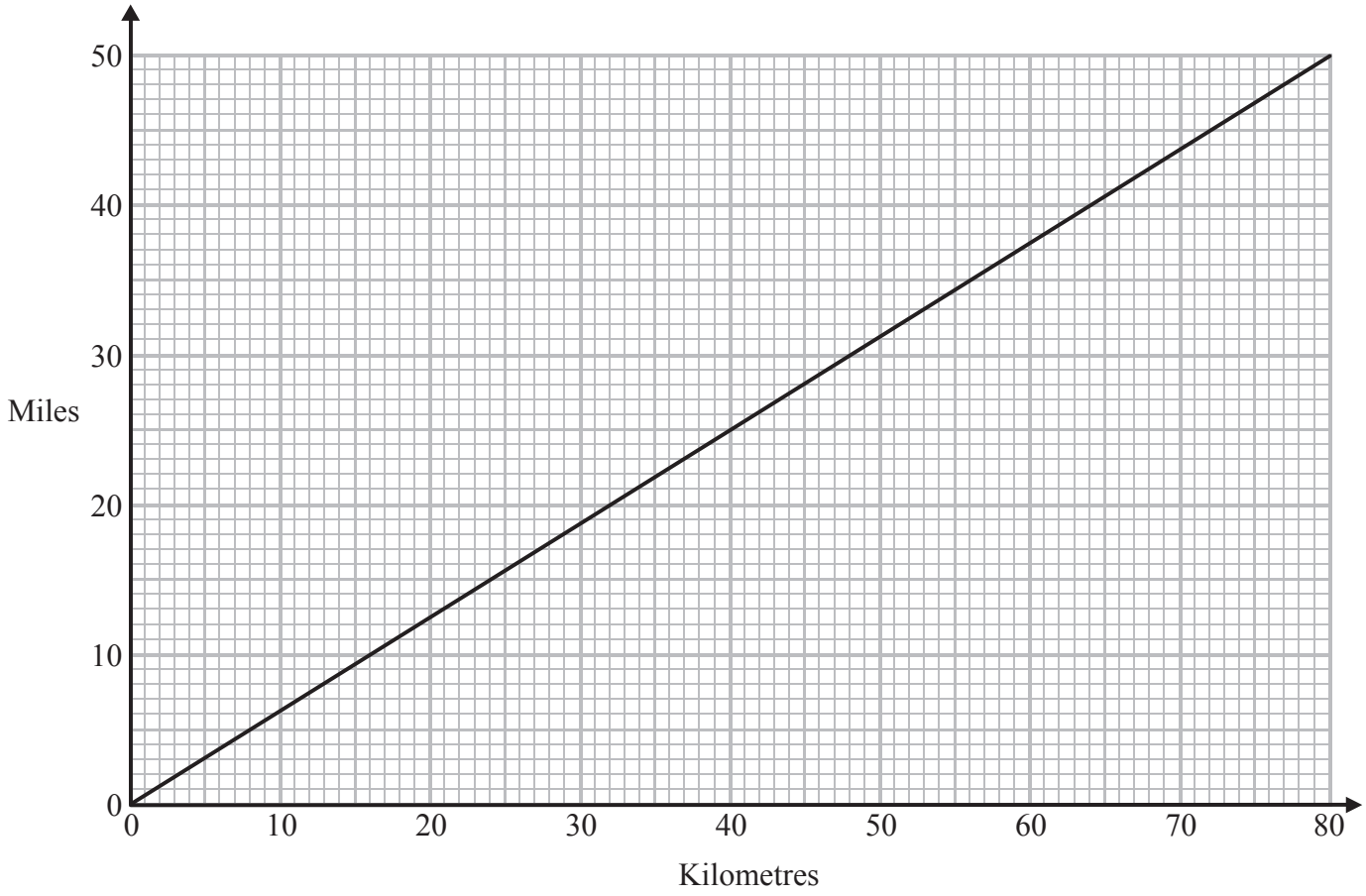
..... sponge fingers

..... m*l* custard

..... g peaches

(Total for Question 3 is 3 marks)

***4** You can use this conversion graph to change between miles and kilometres.



Mary has to drive from Paris to Calais, and then from Dover to Sheffield.
The total distance she has to drive is 350 miles.

Mary has already driven 240 km from Paris to the ferry at Calais.
She goes on a ferry to Dover.
She now has to drive from Dover to Sheffield.

Mary has enough petrol to drive 180 miles.

Will Mary have to stop for petrol on the way to Sheffield?

(Total for Question 4 is 4 marks)

5 (a) Simplify $x^2 \times x^4$

.....

(1)

(b) Simplify $y^8 \div y^6$

.....

(1)

(c) Simplify $(t^2)^3$

.....

(1)

(Total for Question 5 is 3 marks)

6 Ali has some packets.

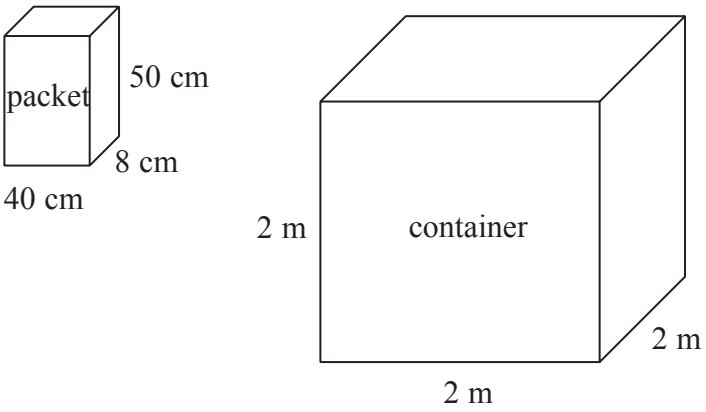


Diagram **NOT** accurately drawn

Each packet has dimensions 40 cm by 8 cm by 50 cm.

Ali fills a container with these packets.
The container is a cube of side 2 m.

Ali fills the container completely with these packets.

Work out the number of packets.

.....

(Total for Question 6 is 4 marks)

***7**

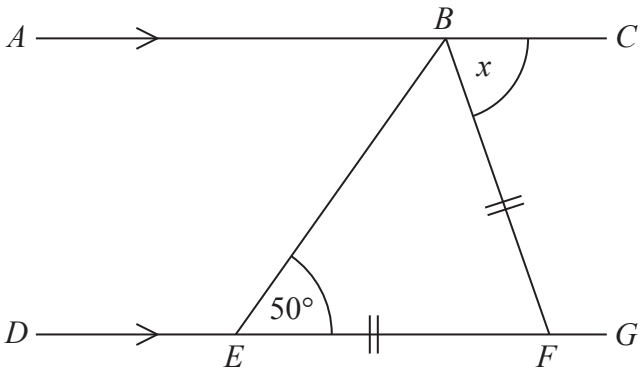


Diagram **NOT** accurately drawn

ABC is a straight line.
DEFG is a straight line.
AC is parallel to *DG*.
EF = *BF*.
Angle *BEF* = 50°.

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

.....°

(Total for Question 7 is 4 marks)

8 Sally is going to buy some packs of blue paint and some packs of white paint.

Blue paint is sold in packs of 12 tubes.
White paint is sold in packs of 15 tubes.

Sally is going to put all the tubes of paint she buys into boxes.
She is going to put 1 tube of blue paint and 1 tube of white paint in each box.

Sally wants to buy the smallest number of packs of blue paint and the smallest number of packs of white paint.

Work out the number of packs of blue paint and the number of packs of white paint she will buy.

..... packs of blue paint

..... packs of white paint

(Total for Question 8 is 4 marks)

9 Here are the first five terms of an arithmetic sequence.

3 5 7 9 11

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

.....

(Total for Question 9 is 2 marks)

10 (a) Expand and simplify $(2x + 1)(x + 3)$

.....

(2)

(b) Factorise fully $4x^2 + 8xy$

.....

(2)

(Total for Question 10 is 4 marks)

11 Write these numbers in order of size.
Start with the smallest number.

0.0034×10^5 34×10^{-5} -3.4×10^{-3} 3.4×10^4 34×10^2

.....

(Total for Question 11 is 3 marks)

12

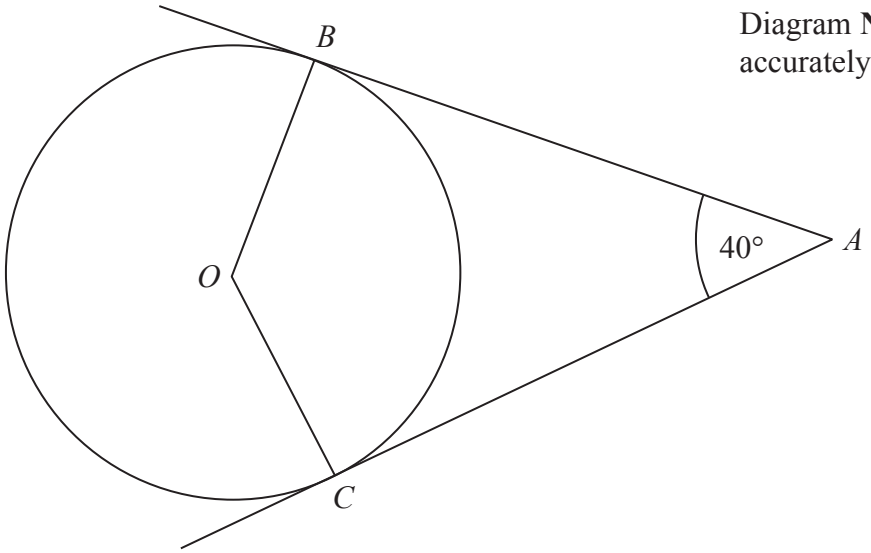


Diagram **NOT** accurately drawn

B and *C* are points on the circumference of a circle, centre *O*.
AB and *AC* are tangents to the circle.
Angle *BAC* = 40°.

Find the size of angle *BCO*.

°

(Total for Question 12 is 3 marks)

13 Harry travels from Appleton to Brockley at an average speed of 50 mph.
He then travels from Brockley to Cantham at an average speed of 70 mph.

Harry takes a total time of 5 hours to travel from Appleton to Cantham.
The distance from Brockley to Cantham is 210 miles.

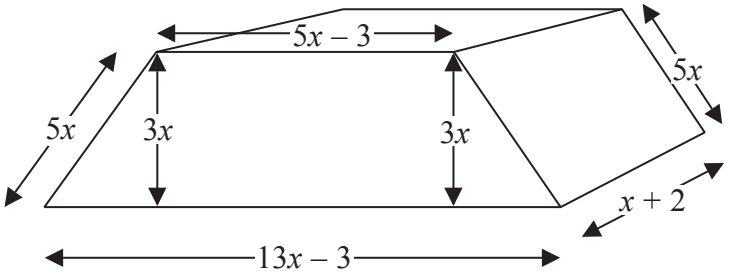
Calculate Harry's average speed for the total distance travelled from Appleton to Cantham.

..... mph

(Total for Question 13 is 4 marks)

***14** This shape is a solid prism.
The cross section of the prism is a trapezium.

Diagram **NOT** accurately drawn



Show that the total surface area of the prism is $82x^2 + 32x - 12$

(Total for Question 14 is 4 marks)

15 Express the recurring decimal $0.1\dot{5}$ as a fraction.
Give your answer in its simplest form.

.....

(Total for Question 15 is 3 marks)

16 Write $(5 - \sqrt{5})^2$ in the form $a + b\sqrt{5}$, where a and b are integers.

.....

(Total for Question 16 is 2 marks)

17 The straight line **L** has equation $y = 2x - 5$

Find an equation of the straight line perpendicular to **L** which passes through (–2, 3).

.....

(Total for Question 17 is 3 marks)

18 Simplify fully $\dfrac{3x^2 - 6x}{x^2 + 2x - 8}$

.....

(Total for Question 18 is 3 marks)

TOTAL FOR PAPER IS 60 MARKS