Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
TOTAL	

AQA

Level 1/Level 2 Certificate
Higher Level
June 2014

Use of Mathematics 43503H

Core unit

Monday 19 May 2014 9.00 am to 10.15 am

For this paper you must have:
- a clean copy of the Data Sheet (enclosed)
- a calculator
- a pair of compasses
- a protractor
- a ruler.

Time allowed
- 1 hour 15 minutes

Instructions
- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- You may **not** refer to the copy of the Data Sheet that was available prior to this examination. A clean copy is enclosed for your use.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 50.
- You are expected to use a calculator where appropriate.

Advice
- In all calculations, show clearly how you work out your answer.

Do not write outside the box

Section A

Answer **all** questions.

Answer each question in the space provided for that question.

Use **UK family spending** *on pages 2 and 3 of the Data Sheet.*

1 (a) Out of the £64.90 spent on transport in 2010, £33.30 was spent on car costs. This is divided up into four areas, as shown.

Car costs	
Spares and accessories	£2.10
Petrol, diesel and oil	£21.60
Repairs and servicing	£7.00
Other motoring costs	£2.60
Total	**£33.30**

Draw a pie chart to show this information.

[4 marks]

Space for working

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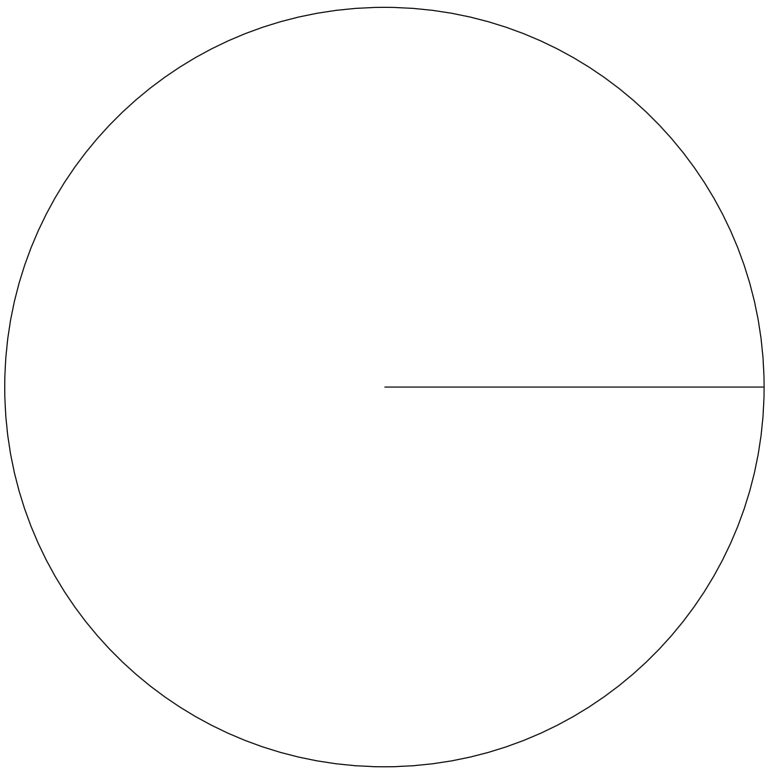

Do not write outside the box

1 (b) The amount spent on transport in 2009 was £58.40 .

Calculate the percentage increase in the amount spent on transport in 2010.

[3 marks]

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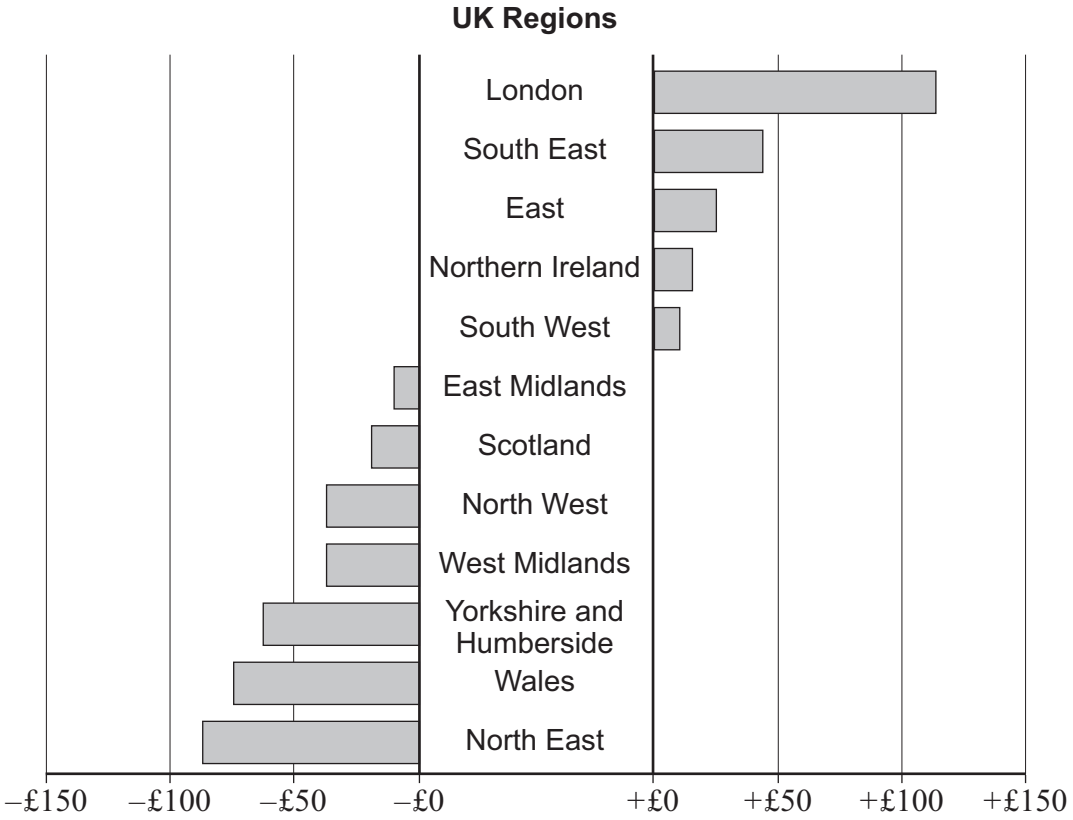
Answer ..... %

Question 1 continues on the next page

Do not write outside the box

1 (c) For the three years 2008, 2009 and 2010, the mean family spending was £467 per week.

The mean family spending of £467 per week is the mean for the whole of the UK. People in some regions spend more than this and people in other regions spend less than this. The comparison is shown by the chart below.



Use the chart to estimate the mean weekly family spending in Yorkshire and Humberside.

Show all your working.

[2 marks]

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Answer £ .....

9

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Turn over for the next question

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ANSWER IN THE SPACES PROVIDED

Do not write outside the box

Section B

Answer **all** questions.

Answer each question in the space provided for that question.

Use **Postage rates** *on page 4 of the Data Sheet.*

2 (a) Rashid could choose to post larger items as either parcels or packets.

How much more expensive was it to post a packet weighing 7500 g by 1st Class post than to post the same packet as a parcel?

[3 marks]

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Answer £ .....

2 (b) (i) Janet posted a number of small letters.
She posted four letters by 1st Class post and paid for recorded delivery for one of these letters.
She also posted x letters by 2nd Class post.

Show that the total cost of posting all these letters, C pence, is given by

$C = 50x + 335$

[2 marks]

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Answer .....

2 (b) (ii) Janet paid a total of £6.85 .
Solve the equation

$$685 = 50x + 335$$

to find x, the number of 2nd Class letters that she posted.

[2 marks]

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Answer $x =$ .....

Do not write outside the box

2 (c) On a different day, Janet posted y small letters by 1st Class post.
She paid for recorded delivery for two of these letters.

She also posted y small letters by 2nd Class post.

The 2nd Class letters cost her £3.50 less than the cost of posting the 1st Class letters.

Form an equation in y and solve the equation to find the **total number** of letters that she posted that day.

[5 marks]

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Answer .....

12

Turn over for the next question

Do not write outside the box

Section C

Answer **all** questions.

Answer each question in the space provided for that question.

Use **Rectangular paper sizes** *on page 5 of the Data Sheet.*

3 (a) The area of a B4 size sheet of paper is $884\ \text{cm}^2$.

Calculate the area of a B6 size sheet of paper.

[2 marks]

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Answer ..... cm^2

3 (b) The perimeter of a B0 size sheet of paper is $4.83\ \text{m}$, correct to two decimal places.
The perimeter of a B3 size sheet of paper is 35.4% of the perimeter of a B0 size sheet.

Calculate the perimeter of a B3 size sheet of paper.

[2 marks]

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Answer ..... m

Do not write outside the box

3 (c) The width, w, and the length, l, of a sheet of paper are connected by the formula

$$l^2 = 2w^2$$

Use this formula to find, to the nearest mm, the width of a sheet of paper which has length $62.5\ \text{mm}$.

[3 marks]

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Answer ..... mm

7

Turn over for the next question

Do not write outside the box

Section D

Answer **all** questions.

Answer each question in the space provided for that question.

Use **Compact discs** *on page 6 of the Data Sheet.*

4 (a) Calculate the circumference of the smaller compact disc with radius 4 cm.

[2 marks]

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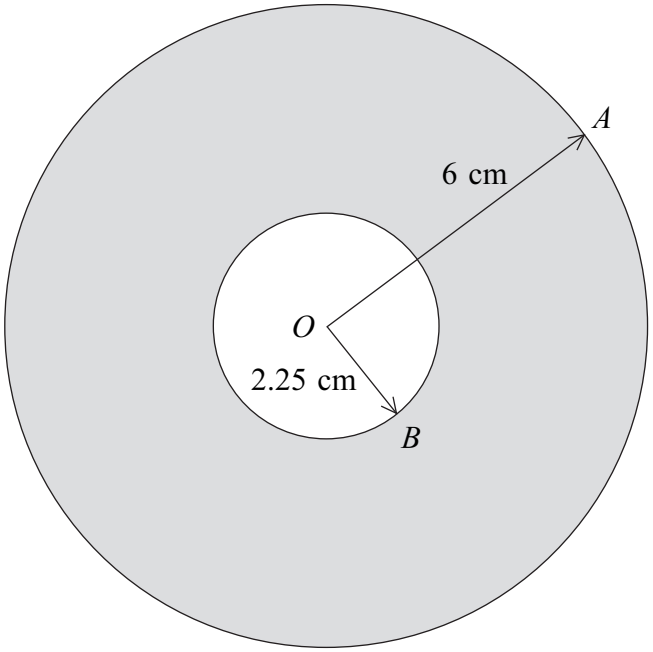
Answer ..... cm

Do not write outside the box

4 (b) A diagram of the larger compact disc is shown below.
Data cannot be stored inside the circle with centre O and radius OB.



Not to scale

O is the centre of the compact disc.
$OA = 6$ cm
$OB = 2.25$ cm

Calculate the shaded area between the circles where data can be stored.

[3 marks]

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Answer ..... cm^2

Question 4 continues on the next page

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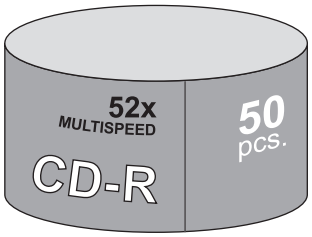
4 (c) (i) Compact discs are sold in packs of 25, 50 or 100 .
A pack of 50 larger compact discs forms a cylindrical shape with height 7 cm, as shown below.



Not to scale

Calculate the curved surface area of a pack of 50 larger compact discs.

[2 marks]

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Answer ..... cm^2

4 (c) (ii) A pack of 50 compact discs costs $\frac{7}{12}$ of the cost of a pack of 100 compact discs.

A pack of 25 compact discs costs $\frac{5}{7}$ of the cost of a pack of 50 compact discs.

A pack of 25 compact discs costs £3.50 .

Calculate the cost of a pack of 100 compact discs.

[2 marks]

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Answer £ .....

9

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Turn over for the next question

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ANSWER IN THE SPACES PROVIDED

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Section E

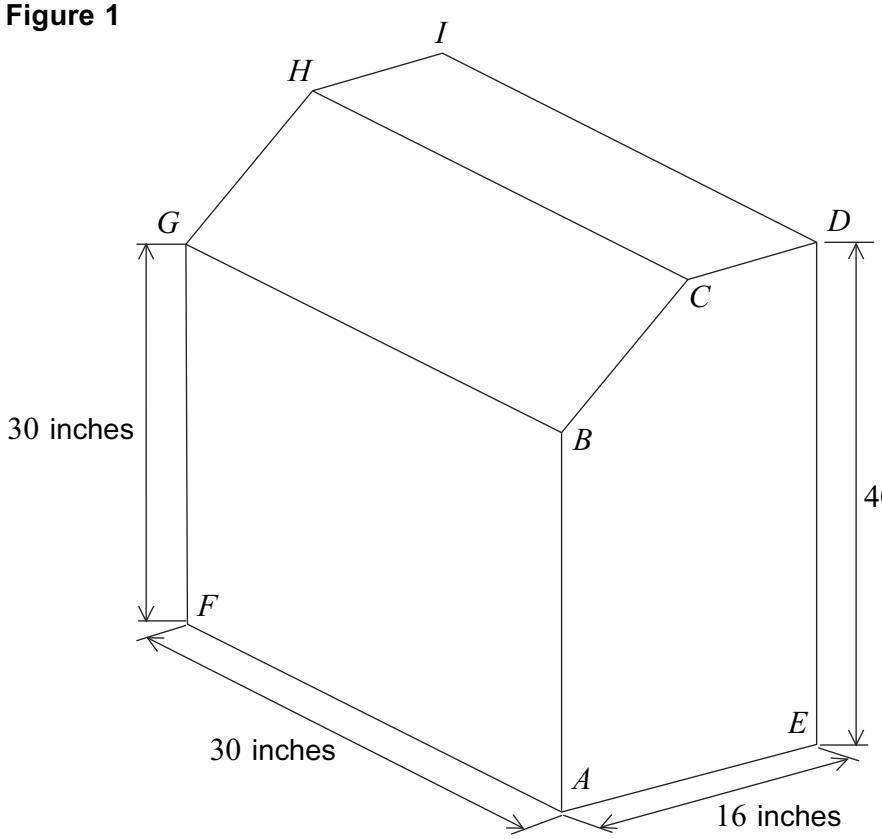
Answer **all** questions.

Answer each question in the space provided for that question.

Use **Writing desk** *on page 7 of the Data Sheet.*

5 A diagram of the writing desk is shown in **Figure 1**.

Figure 1



Not to scale

$AB = FG = 30$ inches
$AE = 16$ inches
$DE = 40$ inches
$CD = \frac{1}{2}AE$
AB is parallel to ED, and AE is parallel to CD.

5 (a) Calculate the volume of the writing desk.

[5 marks]

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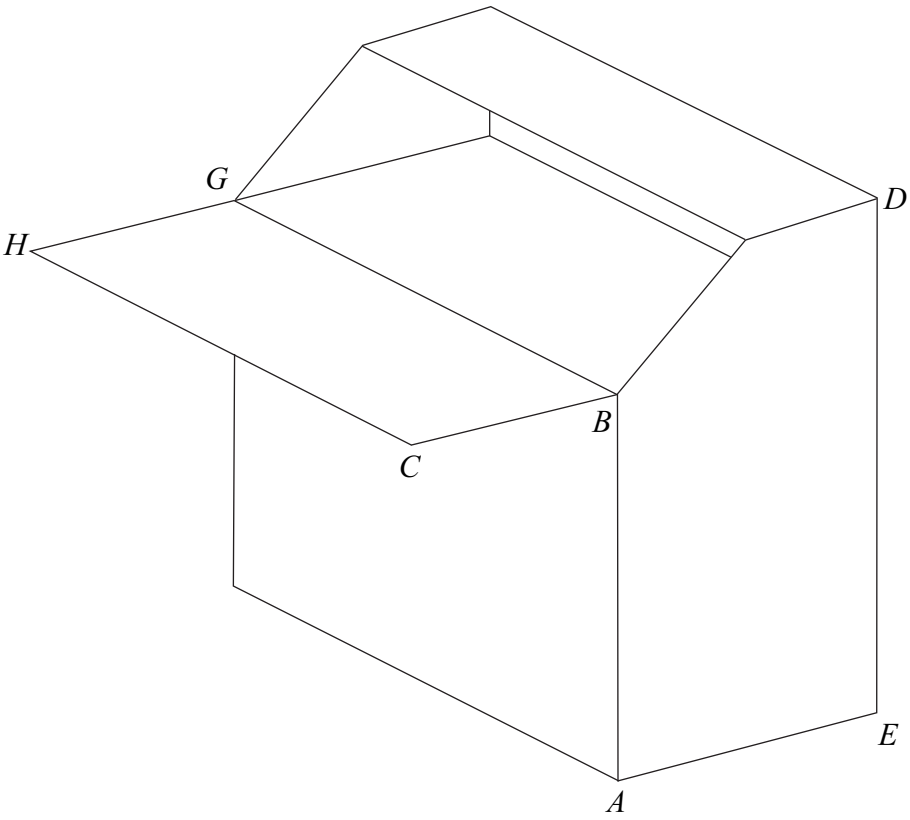
Answer ..... in^3

Do not write outside the box

5 (b) (i) The sloping section of the writing desk opens to create a flat level surface for writing, as shown in **Figure 2**.

Figure 2



Not to scale

Using **Figure 1**, calculate the length of BC.
Hence find the area of the writing surface $CHGB$.

[5 marks]

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Answer ..... in^2

Question 5 continues on the next page

Do not write outside the box

5 (b) (ii) George decides to make a similar writing desk.
The ratio of the height of the original writing desk to George's desk is $4:3$.

Calculate the area of the writing surface of George's desk.

[3 marks]

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Answer ..... in^2

13

END OF QUESTIONS

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