AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

Level 1/Level 2 Certificate
USE OF MATHEMATICS

H

Higher Level Core Unit

Monday 23 May 2016 Morning Time allowed: 1 hour 15 minutes

Materials

For this paper you must have:
- a clean copy of the Data Sheet (enclosed)
- a calculator
- mathematical instruments.

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer each question in the space provided. Do not write outside the box around each page or on blank pages.
- 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.

Section A

Answer **all** questions.

Answer each question in the space provided for that question.

Use **Camping** *on page 3 of the Data Sheet*.

1 (a) For how many months of the year is the campsite **open**?
Circle your answer.

[1 mark]

5 6 7 8

1 (b) Lashmi and her husband booked the campsite for three nights in June.
They have a dog and two children.

Calculate the total cost of the booking.

[3 marks]

Answer £_____

1 (c) The total cost of camping for a different group of people was £17.50
This cost included £3.50 for a child and a dog.

What fraction of the total cost was the cost for the child and the dog?
Give your answer in its lowest terms.

[2 marks]

Answer _____

1 (d) One day, the number of caravans and tents at the campsite was 72
The ratio of the number of caravans to the number of tents was 5 : 7

Calculate the number of caravans at the campsite that day.

[2 marks]

Answer _____

8

Turn over for the next question

Section B

Answer **all** questions.

Answer each question in the space provided for that question.

Use **Olympic diving** *on page 4 of the Data Sheet.*

2 (a) A diver performs a back $2\frac{1}{2}$ somersaults dive in the pike position off a 10-metre platform.

The marks awarded by the seven judges are:

7.5 6.5 6.5 6.0 7.0 6.5 7.0

Calculate the diver's score.

[3 marks]

Answer _____

2 (b) The scores for the six dives made by David Boudia at the 2012 Olympic Games in London were:

97.20 86.40 99.90 90.75 91.80 102.60

Calculate the range of these scores.

[2 marks]

Answer _____

2 (c) Russia's Victor Minibaev and Cuba's Jose Guerra competed in the 2012 Olympics 10-metre platform diving final.

Minibaev's scores had a range of 14.4
Guerra's scores had a range of 20.7

What do these ranges tell you about Minibaev's scores compared to Guerra's scores?

[1 mark]

2 (d) Another diver had a mean score of 91.0 for his six dives.

Five of the six scores were:

92.0 89.5 94.0 90.1 84.0

Work out the score for his other dive.

[3 marks]

Answer _____

9

Turn over for the next question

Section C

Answer **all** questions.

Answer each question in the space provided for that question.

Use **House sales and house prices** *on page 6 of the Data Sheet.*

3 (a) Jane sold her house and her total costs were £3550
The table shows the amounts of two of her costs.

Type of cost	Amount (£)
Estate agent's fee	3150
Solicitor's fee	284
Energy Performance Certificate	
Total	**3550**

Use the values in the table to calculate the cost of the house's Energy Performance Certificate.

[2 marks]

Answer £_____

3 (b) In June 2013, the average house price in England and Wales was £162 000

3 (b) (i) In June 2013, the average house price in Tyne and Wear was $\frac{5}{8}$ of the average house price in England and Wales.

Calculate the average house price in Tyne and Wear in June 2013

[2 marks]

Answer £_____

3 (b) (ii) In June 2014, the average house price in England and Wales was 6.4% higher than it was in June 2013

Calculate the average house price for England and Wales in June 2014

[3 marks]

Answer £_____

Turn over for the next question

3 (c) The table shows the number of houses sold between the prices of £50 000 and £300 000, in England and Wales, in June 2014

Price (£)	**Number of houses sold in June 2014 (nearest hundred)**
50 000–	8 300
100 000–	15 300
150 000–	14 400
200 000–	12 000
250 000–300 000	5 500
Total	55 500

3 (c) (i) Estimate the percentage of these 55 500 houses that were sold between the prices of £200 000 and £300 000

[3 marks]

Answer _____ %

3 (c) (ii) The numbers of houses shown in the table are all rounded to the nearest 100

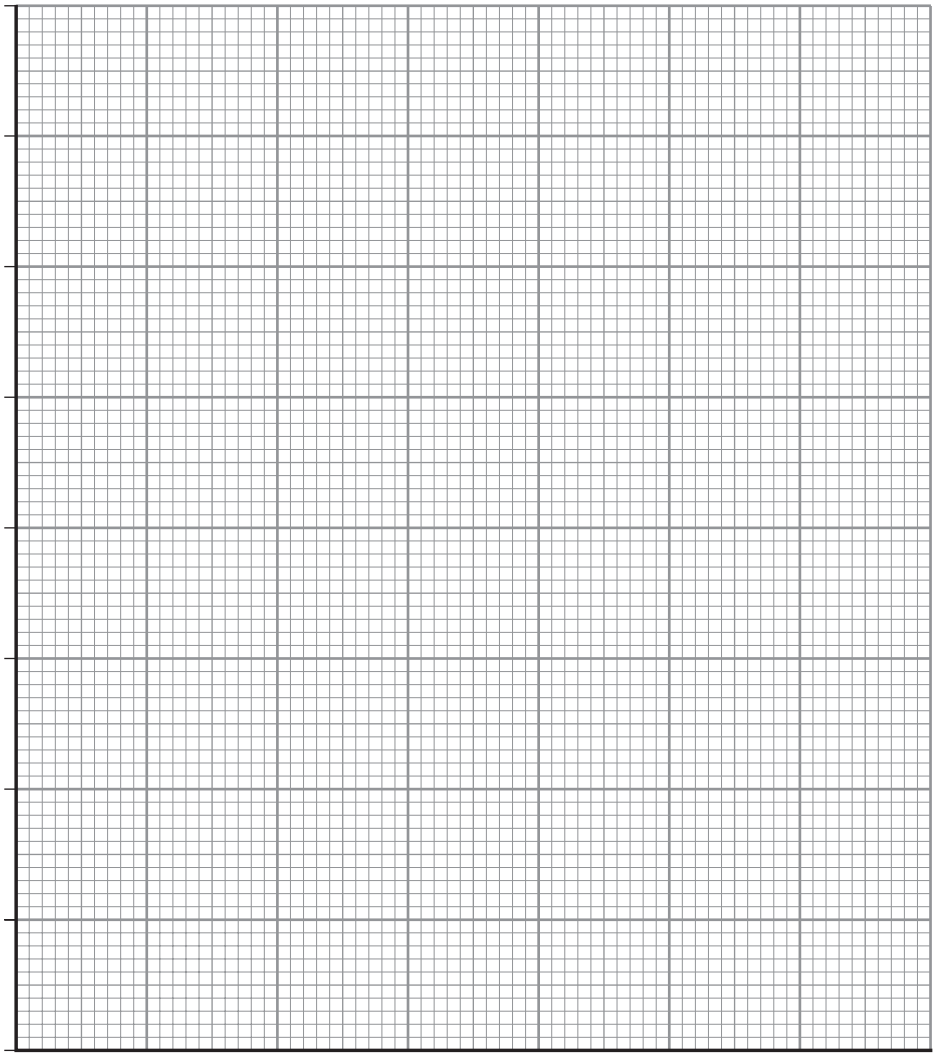
What was the smallest possible number of houses sold between the prices of £50 000 and £100 000 in June 2014?

[1 mark]

Answer _____

3 (c) (iii) Draw a bar chart to show the data.

[2 marks]



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Turn over for the next question

Section D

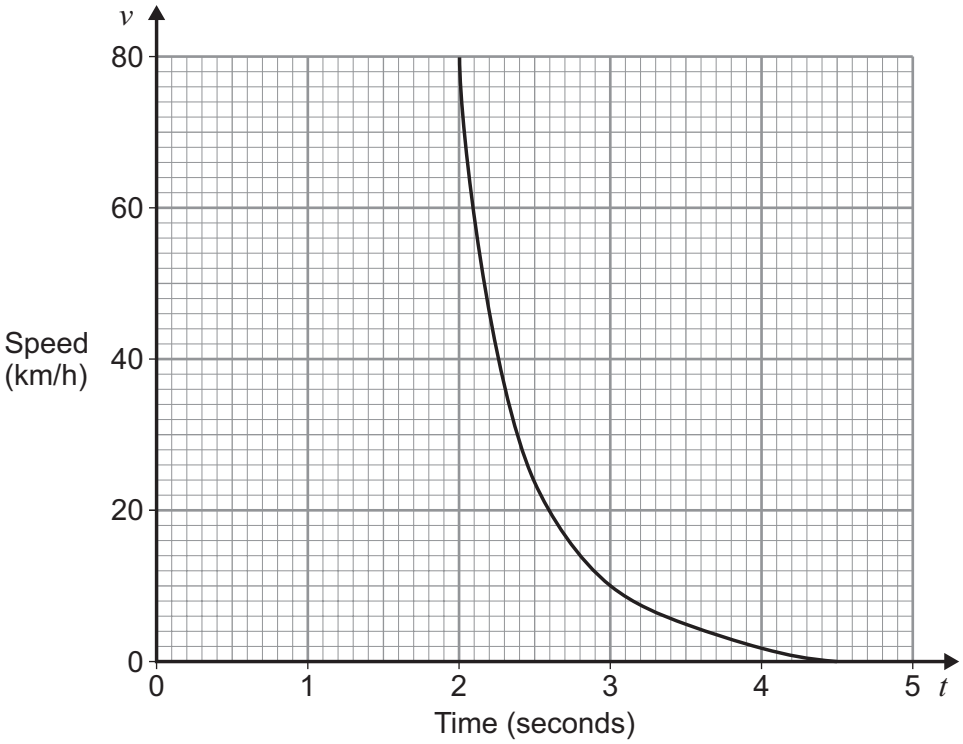
Answer **all** questions.

Answer each question in the space provided for that question.

Use **Theme park ride** *on page 7 of the Data Sheet.*

4 (a) The graph shows the speed, v kilometres per hour, of the Apocalypse ride between $t = 2$ and $t = 4.5$, where t seconds is the time after the ride starts to fall vertically.

The brakes are applied when $t = 2$



4 (a) (i) Use the graph to find the time taken for the speed of the ride to reduce from 24 km/h to 2 km/h

[2 marks]

Answer _____ seconds

4 (a) (ii) The **speed** of the ride before the magnetic brakes are used is **directly proportional** to the **time** taken.

Complete the graph opposite to show the speed of the ride between $t = 0$ and $t = 2$

[1 mark]

4 (b) The distance, d metres, fallen by the Apocalypse ride and the time, t seconds, from $t = 0$ to $t = 2$ are connected by the formula

$$d = \frac{50}{9} t^2$$

4 (b) (i) Find the distance fallen after 1.5 seconds.

[2 marks]

Answer _____ m

4 (b) (ii) Find the time taken for the ride to fall 18 metres.

[3 marks]

Answer _____ seconds

8

Turn over for the next question

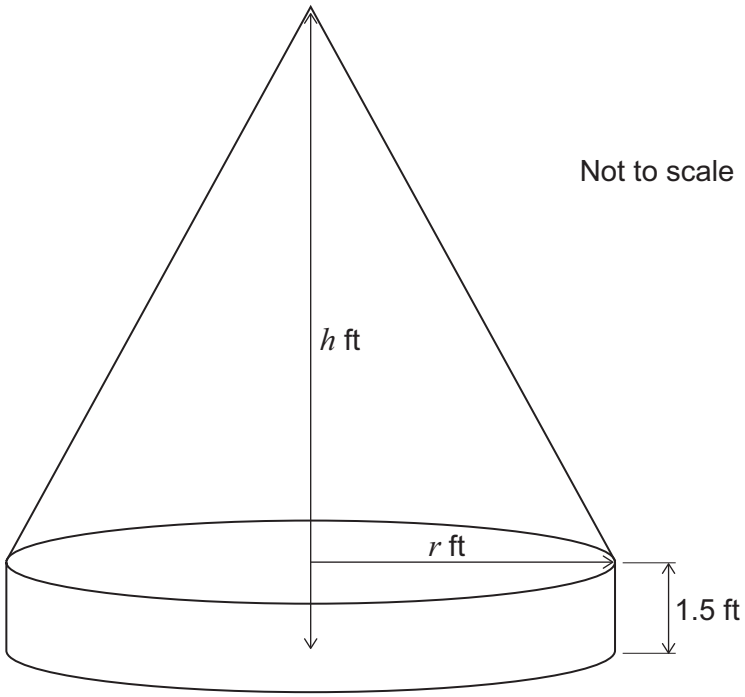
Section E

Answer **all** questions.

Answer each question in the space provided for that question.

Use **Tents** *on page 8 of the Data Sheet.*

5 (a) The diagram shows a bell tent.



The diagram shows a cone on top of a cylinder.
The cylinder and the base of the cone have a radius of r feet.
The top of the tent is h feet above the ground.
The height of the cylinder is 1.5 feet.

The volume, V, of the tent is given by

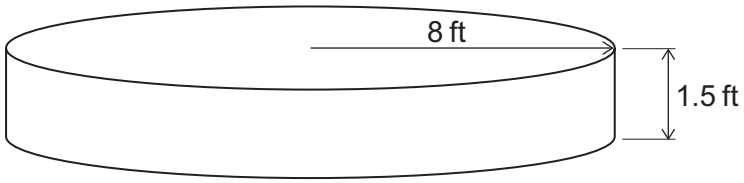
$$V = \frac{1}{3}\pi r^2(h + 3)$$

5 (a) (i) Find the volume when $r = 8$ and $h = 9$
Give the units of your answer.

[3 marks]

Answer _____

5 (a) (ii) The diagram shows the cylindrical section of the bell tent.



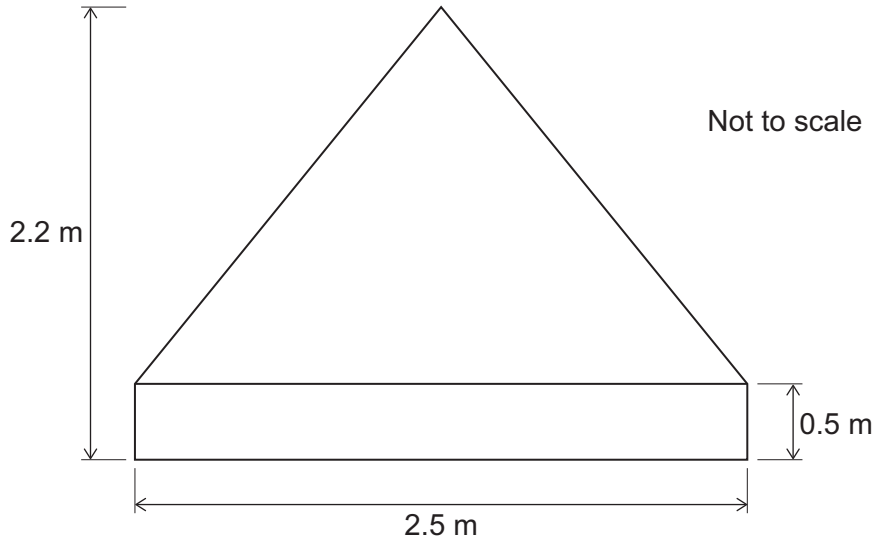
Find the curved surface area of the cylindrical section.
Ignore the top and bottom.

[2 marks]

Answer _____ ft^2

Question 5 continues on the next page

5 (b) The diagram shows an end of a ridge tent.



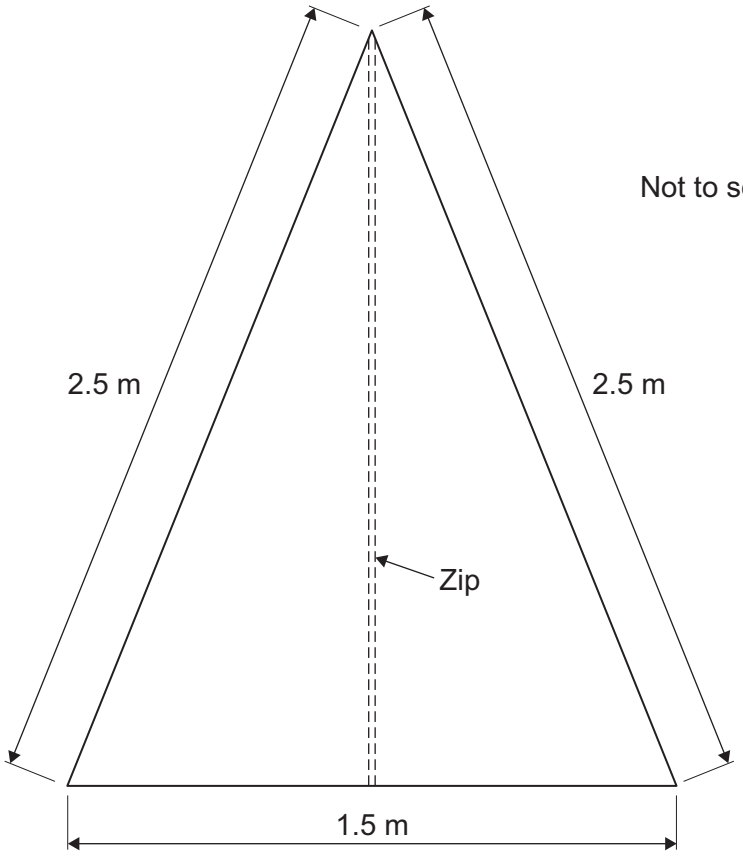
Each end of this ridge tent is in the shape of a triangle on top of a rectangle.
The top of the triangle is 2.2 metres above the ground.

Calculate the area of one end of the tent.

[4 marks]

Answer _____ m^2

5 (c) A diagram of one side of a teepee is shown.



A zip connects the top of this side to the mid-point of its base.

Calculate the length of the zip.

[3 marks]

Answer _____ m

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END OF QUESTIONS

There are no questions printed on this page

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