Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						5	5	2	3	/	0	4	Signature	

Paper Reference(s)

5523/04

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics A – 1387

Paper 4 (Calculator)

Intermediate Tier

Friday 10 November 2006 – Morning

Time: 2 hours

Materials required for examination

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Items included with question papers

Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 25 questions in this question paper. The total mark for this paper is 100.
There are 24 pages in this question paper. Any blank pages are indicated.
Calculators may be used.
If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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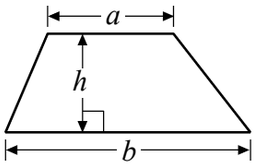
GCSE Mathematics 1387/8

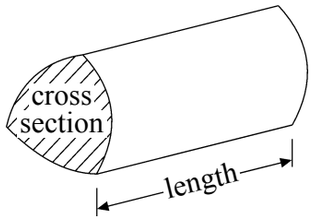
Formulae: Intermediate Tier

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

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



Volume of prism = area of cross section × length



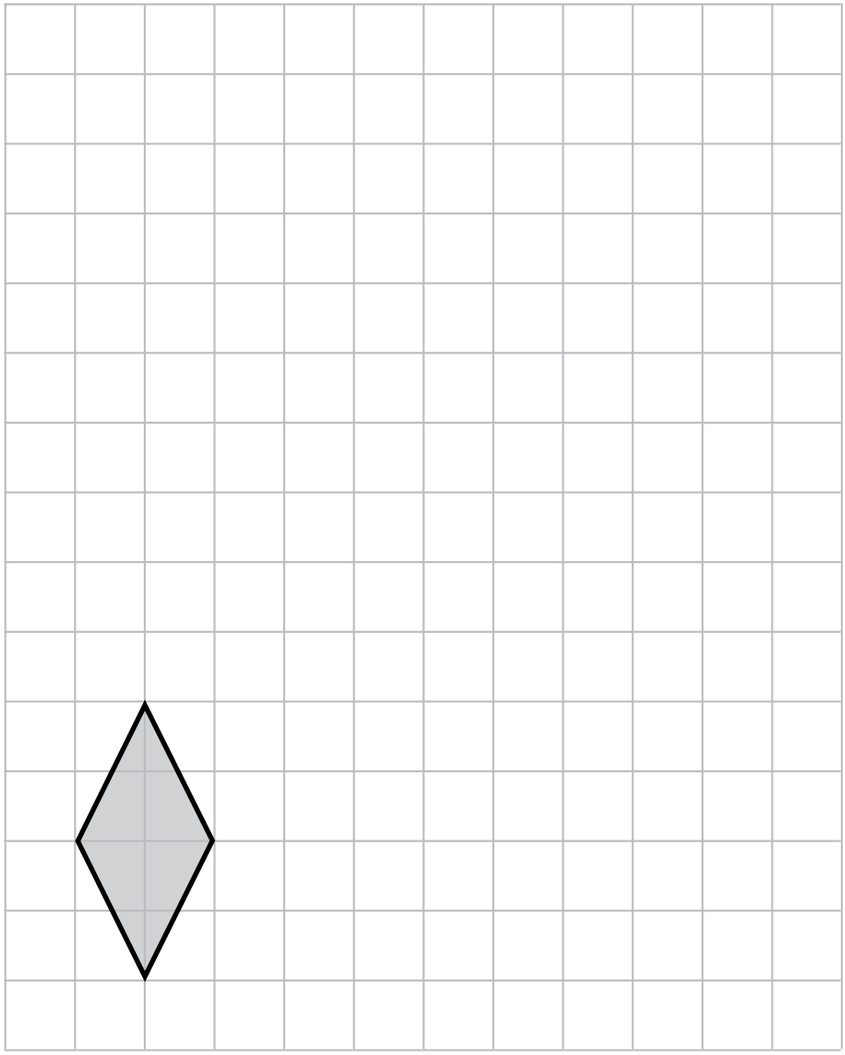
Leave blank

Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. On the grid, draw an enlargement of the shaded shape with a scale factor of 3



Q1

(Total 2 marks)

Leave blank

2. The cost of a cinema ticket for an adult is £5.50
The cost of the cinema tickets for 13 adults and 9 children is £103

Work out the cost of a cinema ticket for a child.

£ .....

Q2

(Total 4 marks)

3. (a) Simplify $4p + 5q + p - 3q$

.....

(2)

(b) Expand $y(y - 5)$

.....

(1)

(c) Expand and simplify $2(3m + 4) + 3(m - 5)$

.....

(2)

Q3

(Total 5 marks)

Leave blank

4.

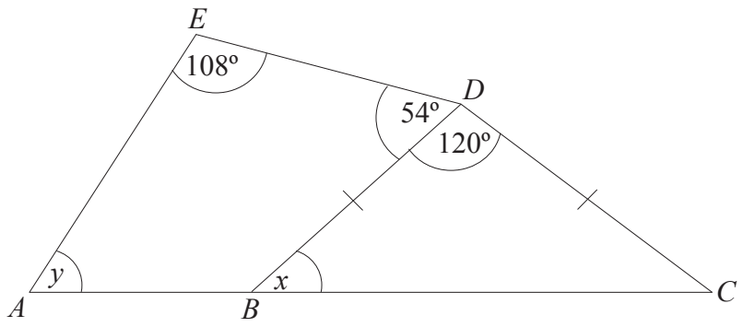


Diagram **NOT** accurately drawn

In the diagram, ABC is a straight line and $BD = CD$.

(a) Work out the size of angle x.

.....°

(2)

(b) Work out the size of angle y.

.....°

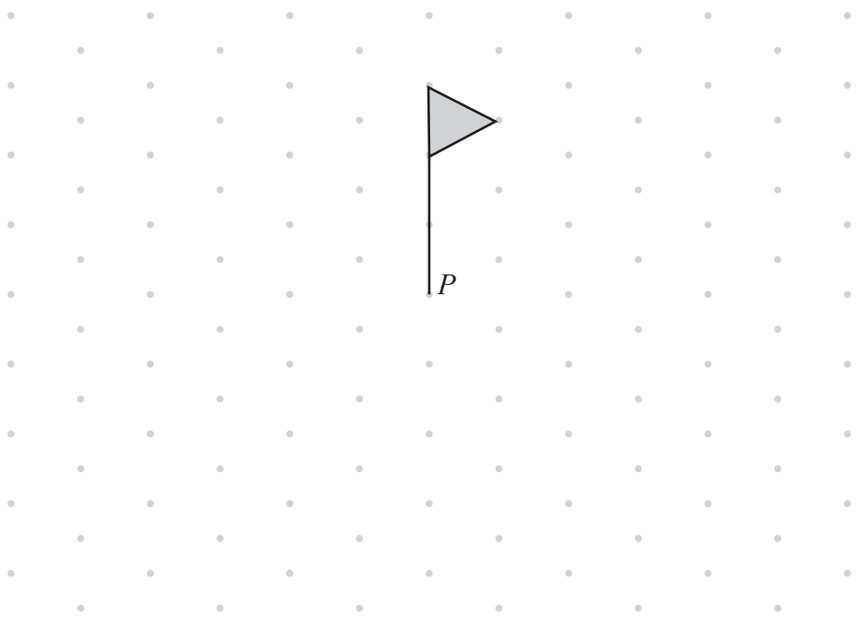
(3) **Q4**

(Total 5 marks)

Leave blank

5. The diagram shows part of a shape.
The shape has rotational symmetry of order 3 about the point *P*.

On the grid, complete the shape.



Q5

(Total 2 marks)

6. The height of a hedge is now 80 cm.
The hedge grows 70 cm higher every year.
Write down a formula for the height, *h* cm, of the hedge *t* years from now.

.....

Q6

(Total 3 marks)

Leave blank

7. Jessica counted the number of words in each of the first 25 sentences of a book.
Here are her results.

24 11 29 28 25 46 19 15 19 18 22 28 22

33 4 1 6 13 30 13 15 2 25 15 6

In the space below, draw an ordered stem and leaf diagram to show her results.
You should include a key.

Q7

(Total 3 marks)

8. An alloy is made from tin and copper.
The ratio of the weight of tin to the weight of copper is 1 : 4

Sally made 35 grams of the alloy.

(a) Work out the weight of tin she used.

.....g
(2)

Sven used 18 grams of tin to make some of the alloy.

(b) Work out the weight of alloy he made.

.....g
(2)

Q8

(Total 4 marks)

Leave blank

9.

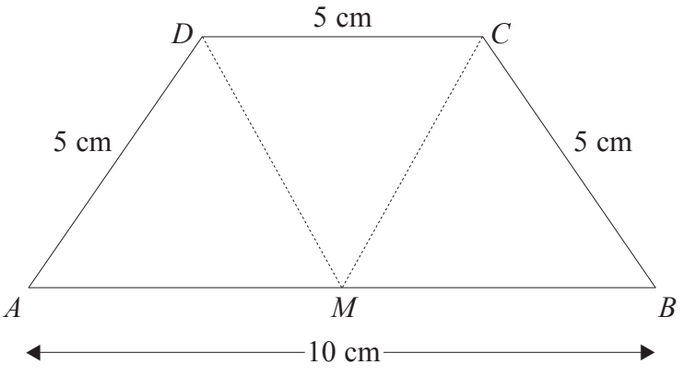
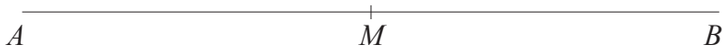


Diagram **NOT** accurately drawn

The diagram shows a trapezium $ABCD$.
$AB = 10$ cm.
$AD = CD = BC = 5$ cm.
M is the midpoint of AB.
It also shows that the trapezium can be split into 3 equilateral triangles.

In the space below, use a ruler and compasses to construct an accurate drawing of the trapezium.
AB has been drawn for you.
You must show all your construction lines.



Q9

(Total 3 marks)

Leave blank

10. The distance from Bristol to Leeds is 216 miles.

(a) Cara drove the 216 miles in 4 hours 30 minutes.
Calculate her average speed.
State the units of your answer.

....

(4)

(b) The amount of petrol Cara's car used for the journey was 23 litres, correct to the nearest litre.

(i) Write down the least possible amount of petrol used.

..... litres

(ii) Write down the greatest possible amount of petrol used.

..... litres

(2) **Q10**

(Total 6 marks)

11. Solve $6x - 5 = 2x + 9$

$x =$ **Q11**

(Total 3 marks)

Leave blank

12. The diagram shows a sketch of a solid object.
The solid object is made from five centimetre cubes.

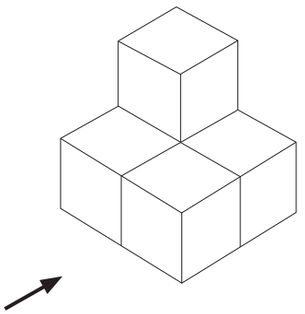
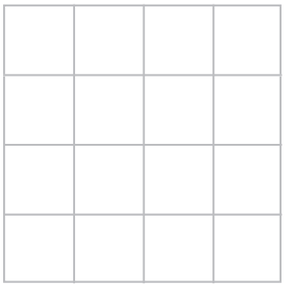


Diagram **NOT** accurately drawn

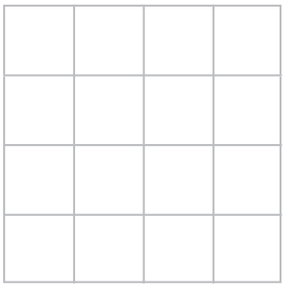
(a) On the grid of centimetre squares, draw the elevation of the solid object in the direction marked with an arrow.



Elevation

(2)

(b) On the grid of centimetre squares, draw the plan of the solid object.



Plan

(2) **Q12**

(Total 4 marks)

Leave blank

13. Here is a table for a two-stage number machine.
It subtracts 5 and then multiplies by 2

(a) Complete the table.

− 5 then × 2	
Input	**Output**
4	–2
2	.....
–3	.....

(2)

(b) The input is n.
Write down an expression, in terms of n, for the output.

.....

(1)

(c) The output is y.
Find an expression, in terms of y, for the input.

.....

(2) **Q13**

(Total 5 marks)

Leave blank

14. The price of all rail season tickets to London increased by 4%.

(a) Before this increase, the price of a rail season ticket from Reading to London was £2664
Work out the price after the increase.

£ .....

(3)

(b) The price of a rail season ticket from Cambridge to London increased by £121.60
Work out the price before this increase.

£ .....

(2)

(c) After the increase, the price of a rail season ticket from Brighton to London was £2828.80
Work out the price before this increase.

£ .....

(3)

Q14

(Total 8 marks)

Leave blank

15. (a) Use your calculator to work out $\dfrac{\sqrt{19.2 + 2.6^2}}{2.7 \times 1.5}$

Write down all the figures on your calculator display.

.....

(2)

(b) Write your answer to part (a) correct to 3 significant figures.

.....

(1) **Q15**

(Total 3 marks)

16. (a) Express 56 as the product of its prime factors.

.....

(2)

(b) Find the Highest Common Factor (HCF) of 56 and 98

.....

(1) **Q16**

(Total 3 marks)

Leave blank

17. The table shows information about the ages of the 240 people at a club.

Age (t years)	Frequency
$15 \leqslant t < 20$	95
$20 \leqslant t < 25$	90
$25 \leqslant t < 30$	35
$30 \leqslant t < 35$	15
$35 \leqslant t < 40$	5

A pie chart is to be drawn for the information in the table.

(a) Work out the size of the angle for people in the class $20 \leqslant t < 25$

.....°

(2)

(b) Write down the modal class.

.....

(1)

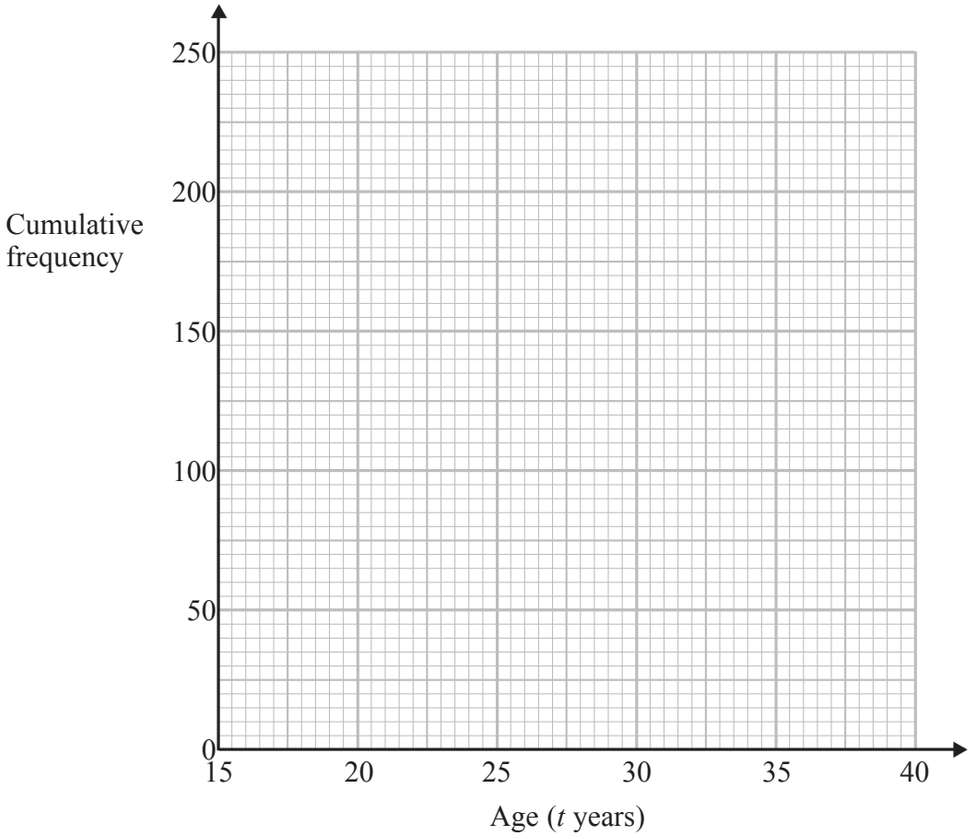
(c) Complete the cumulative frequency table.

Age (t years)	Cumulative frequency
$15 \leqslant t < 20$	
$15 \leqslant t < 25$	
$15 \leqslant t < 30$	
$15 \leqslant t < 35$	
$15 \leqslant t < 40$	

(1)

Leave blank

(d) On the grid, draw the cumulative frequency graph for your table.



(2)

(e) Use your graph to find an estimate for the median age of the people.

..... years

(1)

Q17

(Total 7 marks)

Leave blank

18. (a) The equation

$$x^3 + 4x^2 = 100$$

has a solution between 3 and 4
Use a trial and improvement method to find this solution.
Give your answer correct to one decimal place.
You must show **ALL** your working.

$x =$ .....

(4)

Leave blank

The diagram shows a cuboid.
The base of the cuboid is a square of side x cm.
The height of the cuboid is $(x + 4)$ cm.
The volume of the cuboid is 100 cm^3.

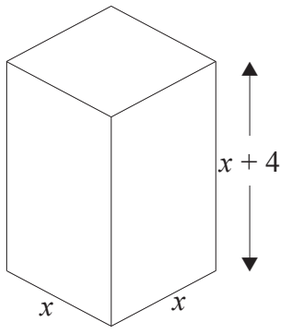


Diagram **NOT** accurately drawn

(b) (i) Show that $x^3 + 4x^2 = 100$

(ii) Use your answer to part (a) to write down the height of the cuboid, correct to 1 decimal place.

..... cm

(2)

Q18

(Total 6 marks)

Leave blank

19.

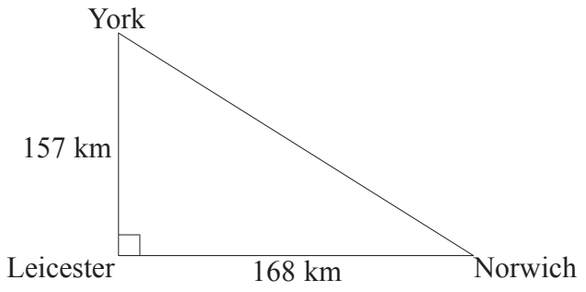


Diagram **NOT** accurately drawn

The diagram shows three cities.
Norwich is 168 km due East of Leicester.
York is 157 km due North of Leicester.

Calculate the distance between Norwich and York.
Give your answer correct to the nearest kilometre.

..... km **Q19**

(Total 3 marks)

Leave blank

20. A DIY store bought 1750 boxes of nails.
Barry took 25 of these boxes and counted the number of nails in each.
The table shows his results.

Number of nails	Number of boxes
14	2
15	9
16	8
17	4
18	2

The numbers of nails in the 25 boxes are typical of the numbers of nails in the 1750 boxes.

Work out an estimate for how many of the 1750 boxes contain 16 nails.

.....

Q20

(Total 3 marks)

Leave blank

21.

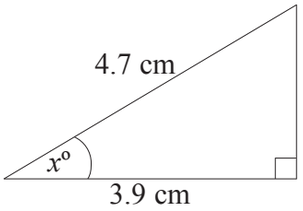


Diagram **NOT** accurately drawn

Work out the value of x.
Give your answer correct to 1 decimal place.

$x =$ .....

Q21

(Total 3 marks)

22. The mass of 6.02×10^{23} atoms of carbon is 12 grams.

(a) Calculate the mass of 1 atom of carbon.
Give your answer in standard form correct to 3 significant figures.

..... g

(2)

(b) Calculate the number of atoms in 100 grams of carbon.
Give your answer in standard form correct to 3 significant figures.

.....

(2)

Q22

(Total 4 marks)

Leave blank

23.

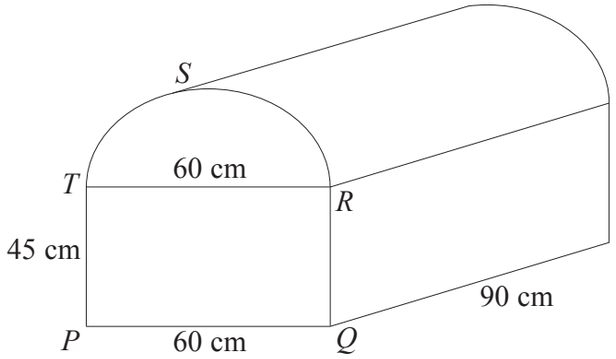


Diagram **NOT** accurately drawn

The diagram shows a prism of length 90 cm.
The cross section, *PQRST*, of the prism is a semi-circle above a rectangle.
PQRT is a rectangle.
RST is a semi-circle with diameter *RT*.
PQ = *RT* = 60 cm.
PT = *QR* = 45 cm.

Calculate the volume of the prism.
Give your answer correct to 3 significant figures.

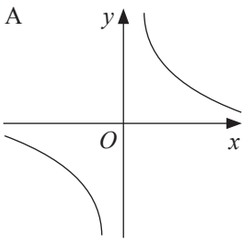
..... cm^3 **Q23**

(Total 4 marks)

Leave blank

24.

A



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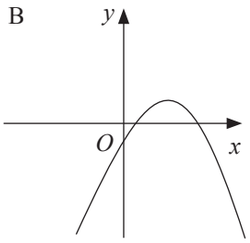

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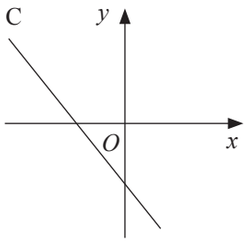

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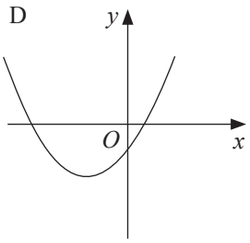

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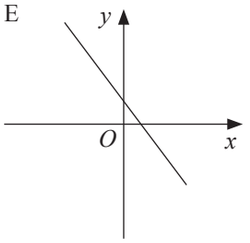

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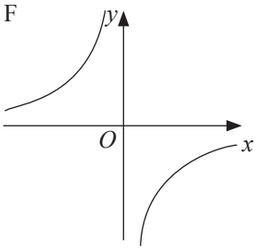

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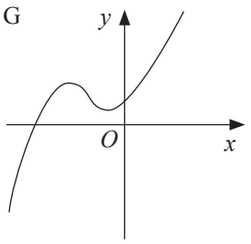

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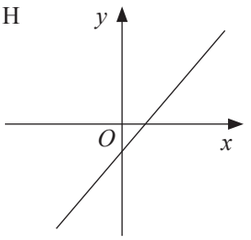
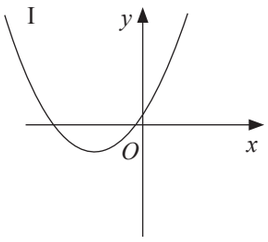


I



Write down the letter of the graph which could have the equation

(i) $y = 1 - 3x$

.....

(ii) $y = \frac{1}{x}$

.....

(iii) $y = 2x^2 + 7x + 3$

.....

Q24

(Total 3 marks)

Leave blank

25. When you are h feet above sea level, you can see d miles to the horizon, where

$$d = \sqrt{\frac{3h}{2}}$$

(a) When you are 50 feet above sea level, how many miles can you see to the horizon? Give your answer correct to 3 significant figures.

..... miles

(2)

(b) Make h the subject of the formula $d = \sqrt{\frac{3h}{2}}$

$h =$ .....

(2)

Q25

(Total 4 marks)

TOTAL FOR PAPER: 100 MARKS

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