Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
January 2011

Mathematics

Module N3 Paper 2
(With calculator)
Higher Tier

[GMN32]

TUESDAY 11 JANUARY

10.30 am – 11.30 am

GMN32

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all twelve** questions.
Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

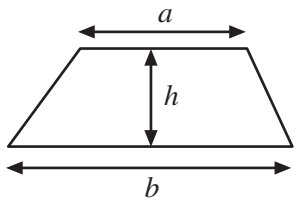
INFORMATION FOR CANDIDATES

The total mark for this paper is 44.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a calculator, ruler, compasses, set-square and protractor.
The Formula Sheet is on page 2.

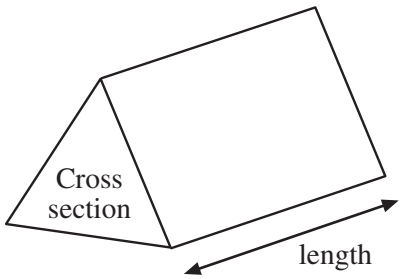
For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Total Marks	

Formula Sheet

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



Volume of prism = area of cross section × length

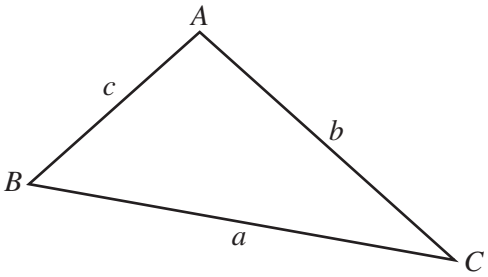


In any triangle ABC

Area of triangle = $\frac{1}{2}ab\sin C$

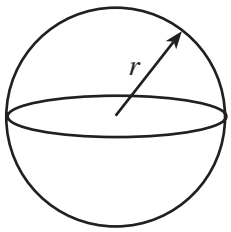
Sine rule : $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine rule: $a^2 = b^2 + c^2 - 2bc\cos A$



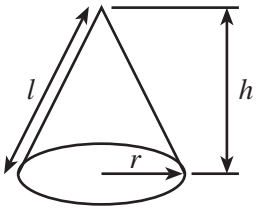
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

Curved surface area of cone = πrl



Quadratic equation:

The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

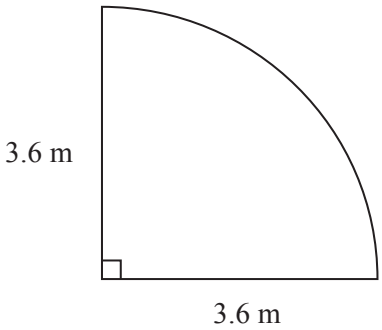
Examiner Only	
Marks	Remark

1 **(a)** A box contains 240 g of cereal, correct to the nearest 10 g.

What is the least possible weight of the box of cereal?

Answer _____ g [1]

(b) Calculate the perimeter of the garden shown below.



Answer _____ [4]

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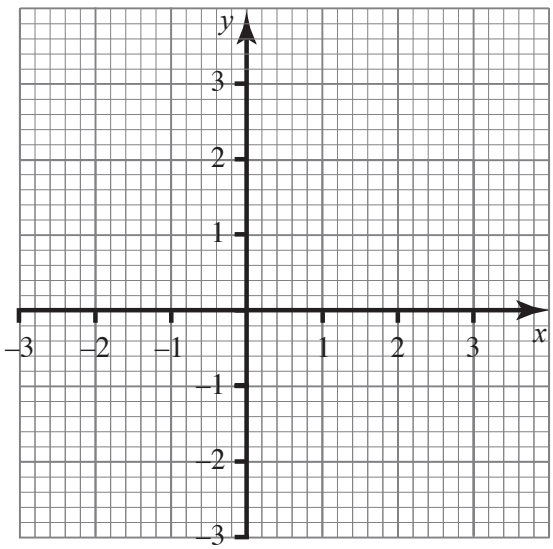
2 Draw the graph of $y = 2x - 1$



[3]

Examiner Only	
Marks	Remark

3 **(a)** A packet of porridge oats contains 660 g.

A special offer packet contains an extra 15%.

How many grams of porridge oats are in the special offer packet?

Answer _____ g [3]

(b) Richard bought a games console for £240

Two years later he sold it for £150

Work out his percentage loss.

Answer _____ % [3]

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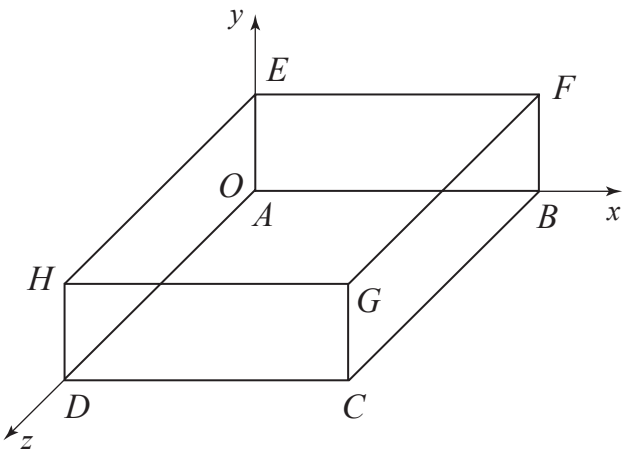
4 The diagram shows a cuboid drawn on a 3D grid.



B is the point (8, 0, 0)
G is the point (8, 2, 6)
Write down the co-ordinates of *H*.

Answer (____, ___, ___) [1]

5 James is designing a questionnaire to test the idea that

"the amount of sleep you need changes with age".

(a) One of his questions will find out the ages of those being questioned.

Write a suitable question he could ask, with response boxes for people to tick.

[2]

Having completed his questionnaire James decided to give it out to all his school friends and their parents.

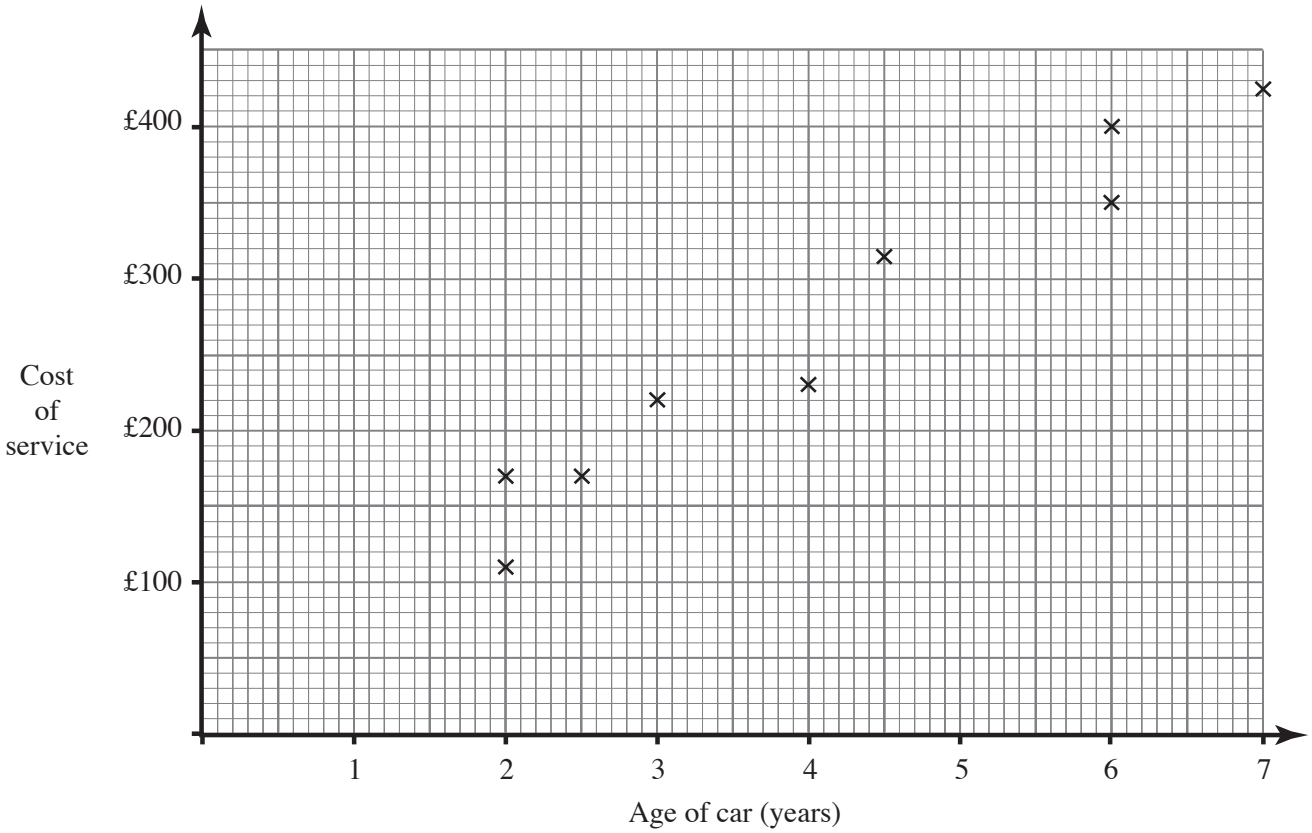
(b) Give one reason why this is not a good sample.

Answer _____

_____ [1]

Examiner Only	
Marks	Remark

6



Examiner Only	
Marks	Remark

The scatter graph shows the cost of service for cars of various age.

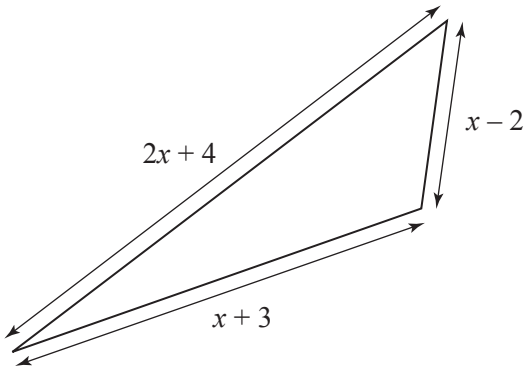
(a) Draw a line of best fit. [1]

(b) Use your line to estimate the cost of service for a 5 year old car.

Answer £ _____ [1]

Examiner Only	
Marks	Remark

7 **(a)** Write an expression, in terms of x, for the perimeter of the triangle shown. Give your answer in its simplest form.



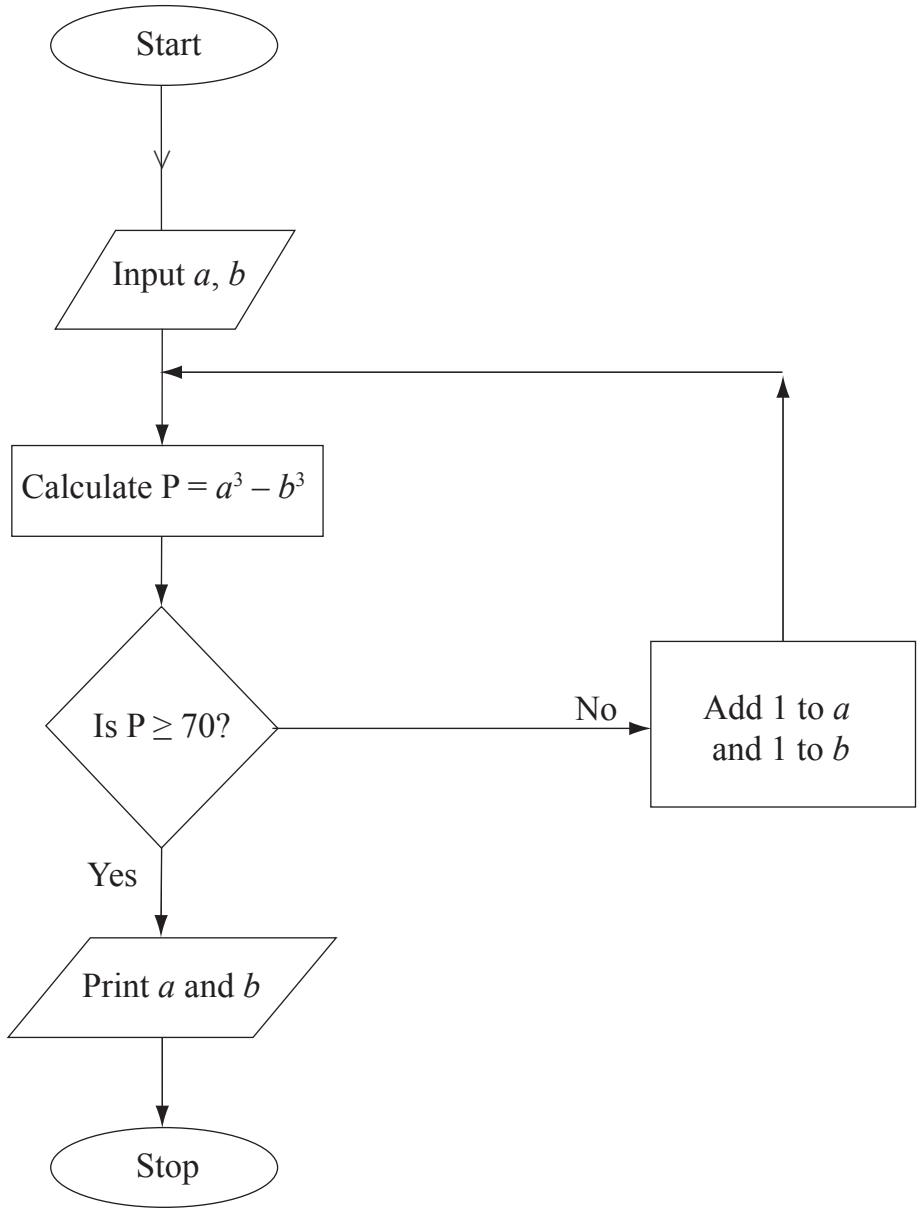
Answer _____ [2]

(b) The perimeter of this triangle is 29 cm.

Write down an equation for the perimeter in terms of x and solve it to find x.

Answer x = _____ [2]

8



Starting with $a = 2$, $b = 1$ use the flow chart to find the values printed.

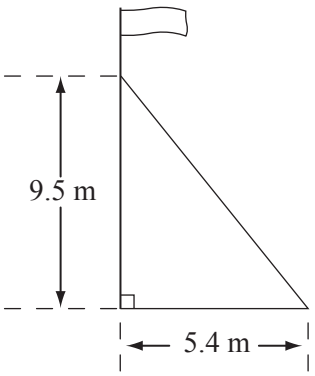
a	b	P
2	1	

Answer $a =$ _____, $b =$ _____ [3]

Examiner Only

Marks	Remark

9 A flagpole is held vertically by a wire fixed to a point 9.5 m above the horizontal ground and to a point on the ground 5.4 m from the pole.



(a) Calculate the length of the wire.

Answer _____ m [3]

(b) Calculate the angle that the wire makes with the ground.

Answer _____ ° [3]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

10 In a sale normal prices are reduced by 12%.

The sale price of a computer is £682

Work out the normal price of the computer.

Answer £ _____ [3]

11 **(a)** Factorise fully $21xy - 7y^2$

Answer _____ [2]

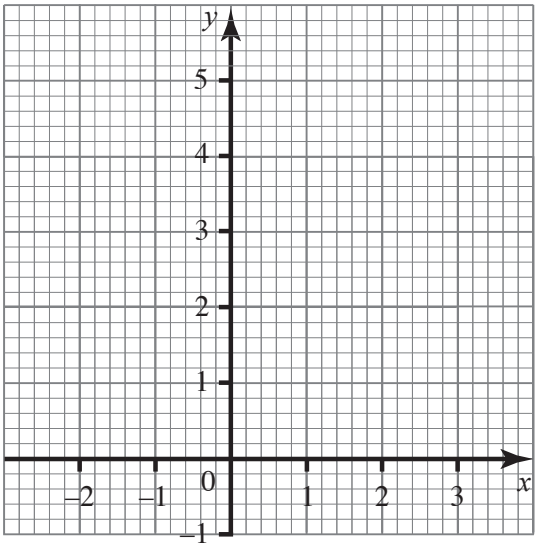
(b) Express $\frac{1}{4v} + \frac{2}{3v}$ as a single fraction in its simplest form.

Answer _____ [3]

12 A straight line with gradient 2 passes through the points (–2, –1) and (1, b).

Examiner Only	
Marks	Remark

(a) Using the axes below, or otherwise, find the value of b.



Answer b = _____ [1]

(b) Find the equation of this line.

Answer _____ [2]

THIS IS THE END OF THE QUESTION PAPER