Write your name here

Surname	Other names

Edexcel GCSE

Centre Number	Candidate Number

Mathematics B

Unit 1: Statistics and Probability (Calculator)

Higher Tier

Tuesday 11 June 2013 – Morning **Time: 1 hour 15 minutes**	Paper Reference **5MB1H/01**

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. 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 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.



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 6 1 0 A 0 1 2 0

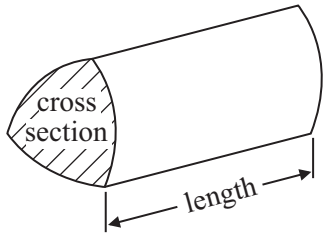
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GCSE Mathematics 2MB01

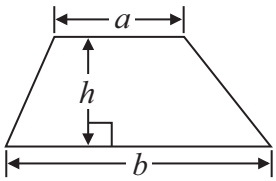
Formulae: Higher Tier

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

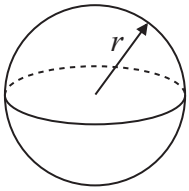


Area of trapezium = $\frac{1}{2}(a + b)h$



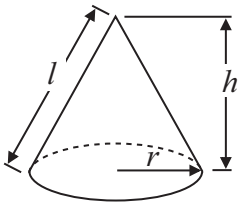
Volume of sphere = $\frac{4}{3}\pi r^3$

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

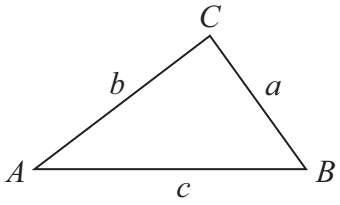


Volume of cone = $\frac{1}{3}\pi r^2 h$

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.

1 Here is a list of ingredients for making 12 cheese scones.

Ingredients for 12 cheese scones
240 g flour 60 g butter 30 g cheese 150 m*l* milk

Jason is going to make 30 cheese scones.

Work out the amount of each ingredient he needs.

flour..... g

butter..... g

cheese..... g

milk..... m*l*

(Total for Question 1 is 3 marks)

2 Here are the heights, in cm, of some potato plants.

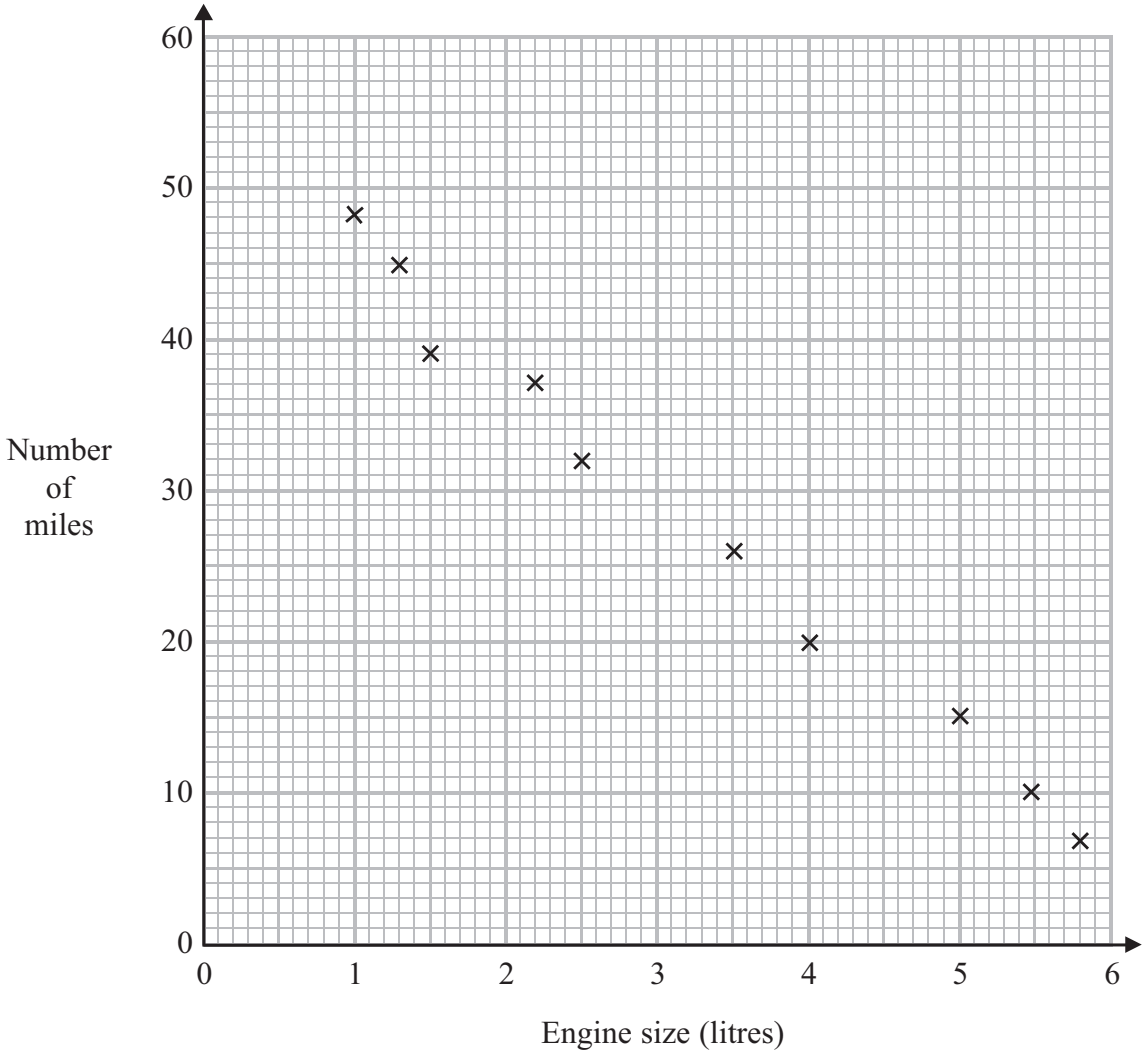
20	35	48	37	25	56	65	42
34	28	25	32	54	62	39	45

Draw an ordered stem and leaf diagram to show this information.

2	
3	
4	
5	
6	

(Total for Question 2 is 3 marks)

3 A car company records the number of miles cars of different engine sizes, in litres, travel using one gallon of fuel.
The scatter graph shows this information.



Another car has an engine size of 1.8 litres and travels 42 miles using one gallon of fuel.

(a) Plot this information on the scatter graph.

(1)

(b) What type of correlation does this scatter graph show?

.....

(1)

(c) Draw a line of best fit.

(1)

A car has an engine size of 2.8 litres.

(d) Find an estimate for the number of miles this car travels using one gallon of fuel.

..... miles

(1)

(Total for Question 3 is 4 marks)

4 Visage is an internet site.
Jaz is going to carry out a survey on the lengths of time people spend using Visage.

He uses this question on a questionnaire.



How much time do you spend using Visage?

☐	☐	☐	☐
none	a little	not much	a lot

(a) Write down **two** things that are wrong with this question.

1. .....

.....

2. .....

.....

(2)

(b) Design a better question that Jaz could use.

(2)

Jaz is going to give his questionnaire to his friends.

(c) This may not produce a good sample.
Give one reason why.

.....

.....

(1)

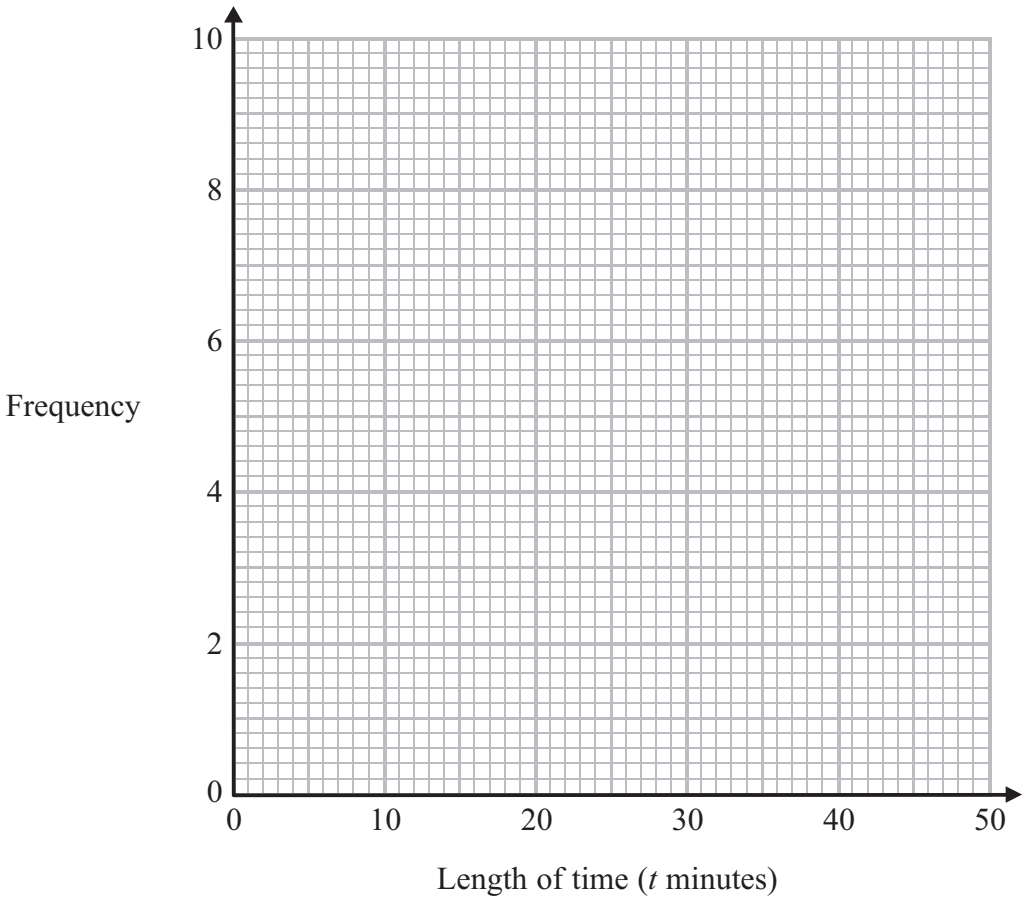
(Total for Question 4 is 5 marks)

5 Helen went on 35 flights in a hot air balloon last year.

The table gives some information about the length of time, t minutes, of each flight.

Length of time (t minutes)	Frequency
$0 < t \leqslant 10$	6
$10 < t \leqslant 20$	9
$20 < t \leqslant 30$	8
$30 < t \leqslant 40$	7
$40 < t \leqslant 50$	5

On the grid below, draw a frequency polygon for this information.



(Total for Question 5 is 2 marks)

6 A pencil has a length of 17 cm measured to the nearest centimetre.

(a) Write down the least possible length of the pencil.

..... cm

(1)

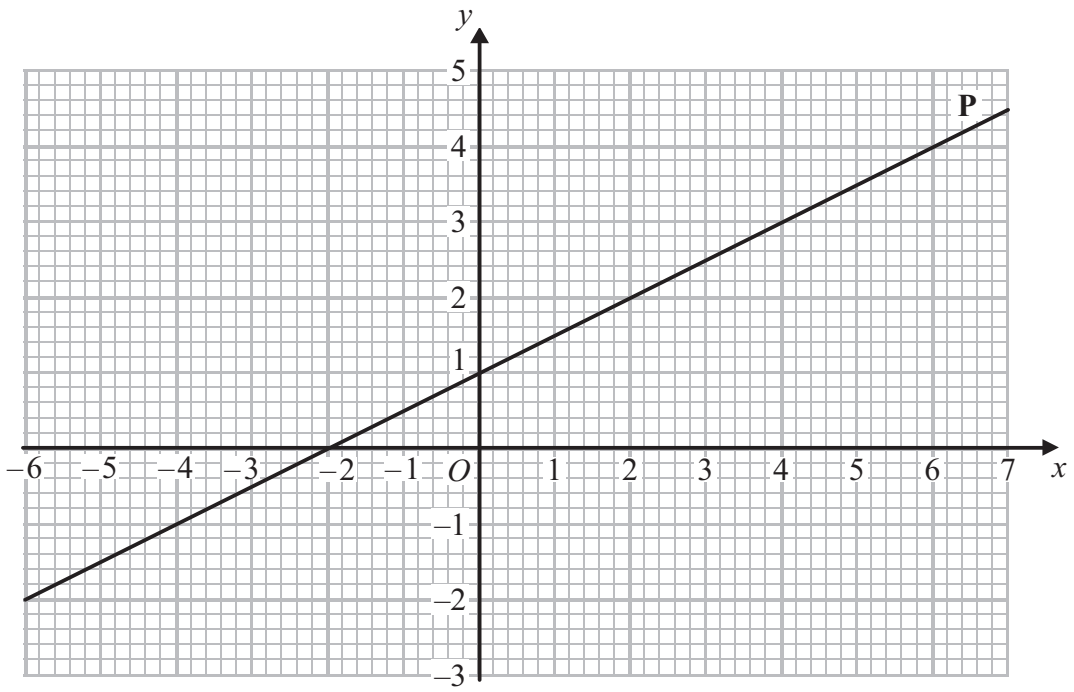
(b) Write down the greatest possible length of the pencil.

..... cm

(1)

(Total for Question 6 is 2 marks)

7 The straight line **P** has been drawn on a grid.



Find the gradient of the line **P**.

.....

(Total for Question 7 is 2 marks)

8 On an activity day students play one sport.

They play football or hockey or tennis.

120 students are on the activity day.

30 of the students are boys.

12 of the boys and 26 of the girls play hockey.

45 of the students play football.
35 of the 45 students who play football are girls.

Work out the number of girls who play tennis.

.....

(Total for Question 8 is 4 marks)

***9** Mr and Mrs Singh are planning a holiday in France.

They want to stay in a hotel or stay in a villa.

If they stay in a hotel, the meals are included in the price.
If they stay in a villa, they will cook their own meals.
The food for their meals will cost £200 each week.

The table gives information about the costs.

Start of holiday	**Hotel (Cost per adult per night)**	**Villa (Cost per week for up to 4 people)**
01 Jan – 28 Feb	£120	£1000
01 Mar – 30 Apr	£125	£1200
01 May – 30 June	£150	£1500
01 July – 31 Aug	£180	£2600
01 Sep – 31 Oct	£150	£1500
Cost for children	40% of adult cost	Included in cost of villa

Mr and Mrs Singh want to go on holiday with their one child on the 3rd of August for one week (7 nights).

Is it cheaper for Mr and Mrs Singh to stay in the hotel or stay in the villa?
You must show all your working.

(Total for Question 9 is 6 marks)

10 Becky buys a new car for £20 000

The value of this car will depreciate

by 15% at the end of the first year
then by 10% at the end of every year after the first year.

After how many years will the car have a value of less than £15 000?
You must show all your working.

..... years

(Total for Question 10 is 4 marks)

11 Jodie picks all the apples from her 56 apple trees.
For each tree she records the total weight of its apples.

The table shows some information about these total weights in kg.

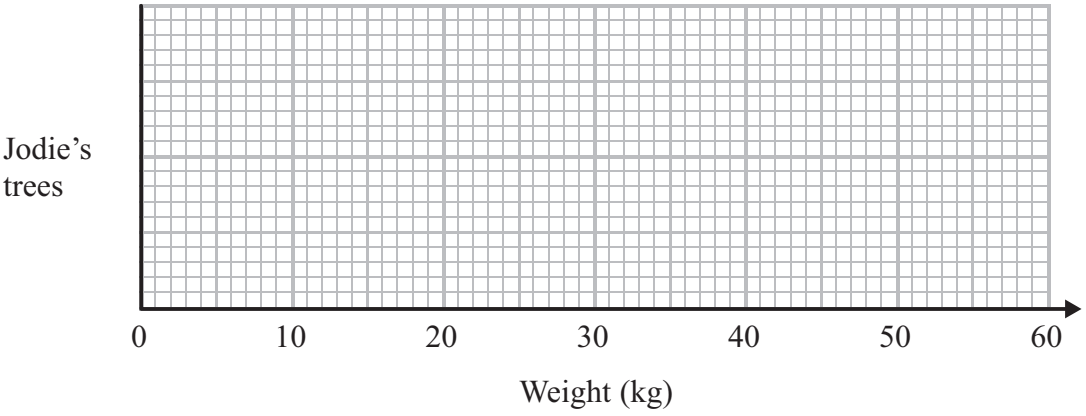
least weight	25
greatest weight	55
median	40
lower quartile	35
upper quartile	45

(a) Work out how many of Jodie's apple trees have a total weight of apples of less than 45 kg.

.....

(2)

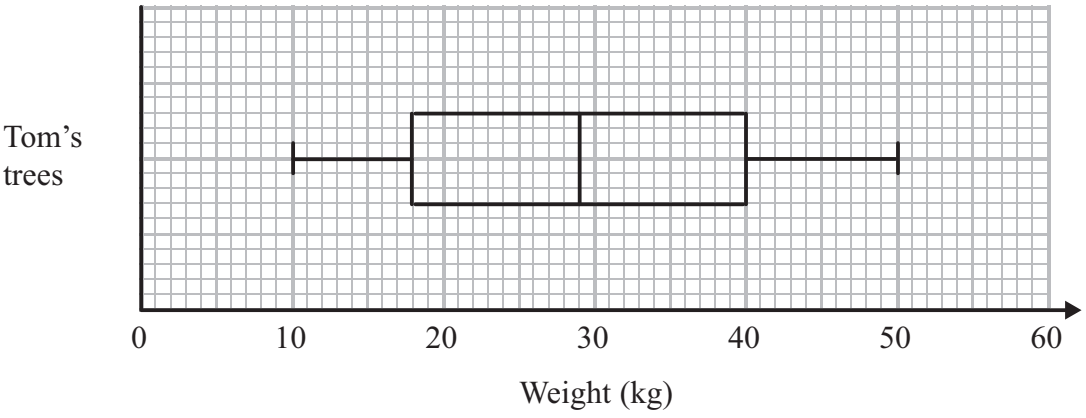
(b) On the grid, draw a box plot for the information in the table.



(2)

Tom has 59 apple trees.

The box plot shows the distribution of the total weights of the apples Tom picks from each of his apple trees.



*(c) Compare the distribution of the weights of apples Jodie picks with the distribution of the weights of apples Tom picks.

.....

.....

.....

.....

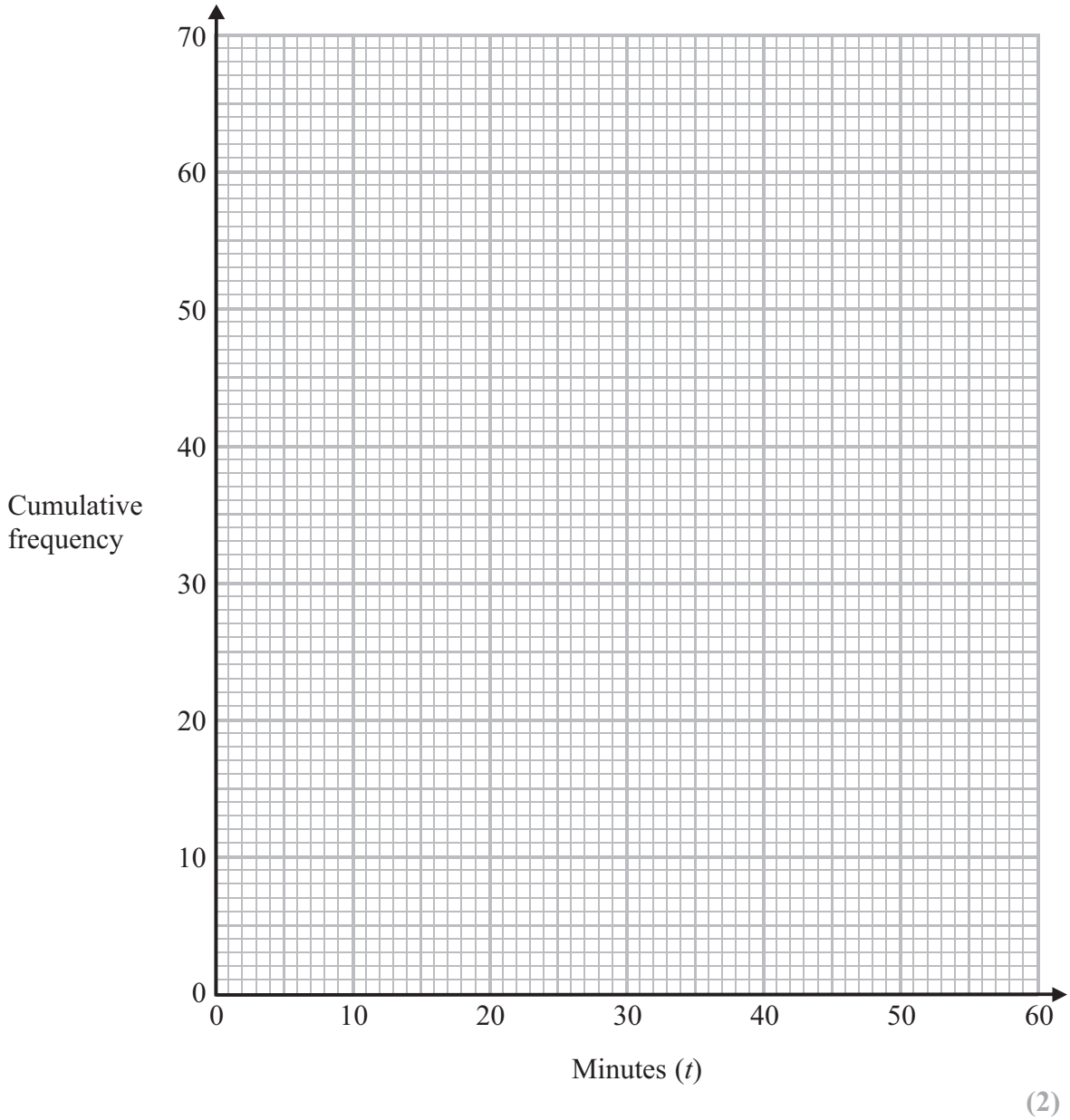
(2)

(Total for Question 11 is 6 marks)

12 The cumulative frequency table gives information about the number of minutes it took Jill to travel from home to school each day last term.

Minutes (t)	Cumulative frequency
$0 < t \leqslant 10$	0
$0 < t \leqslant 20$	2
$0 < t \leqslant 30$	15
$0 < t \leqslant 40$	50
$0 < t \leqslant 50$	63
$0 < t \leqslant 60$	65

(a) On the grid, draw a cumulative frequency graph for the information.



(2)

(b) Use your cumulative frequency graph to find the interquartile range.

..... minutes

(2)

(c) Find an estimate for the number of times Jill took more than 45 minutes to get to school.

.....

(2)

(Total for Question 12 is 6 marks)

13 Henri is carrying out a survey of the people aged 65 and over in his village.

The table shows information about these people.

Age	Male	Female
65 – 69	20	22
70 – 74	18	21
75 – 79	15	18
80 – 84	8	16
85 – 89	5	10
90+	2	5
Total	**68**	**92**

Henri is going to take a sample of 30 people stratified by age.

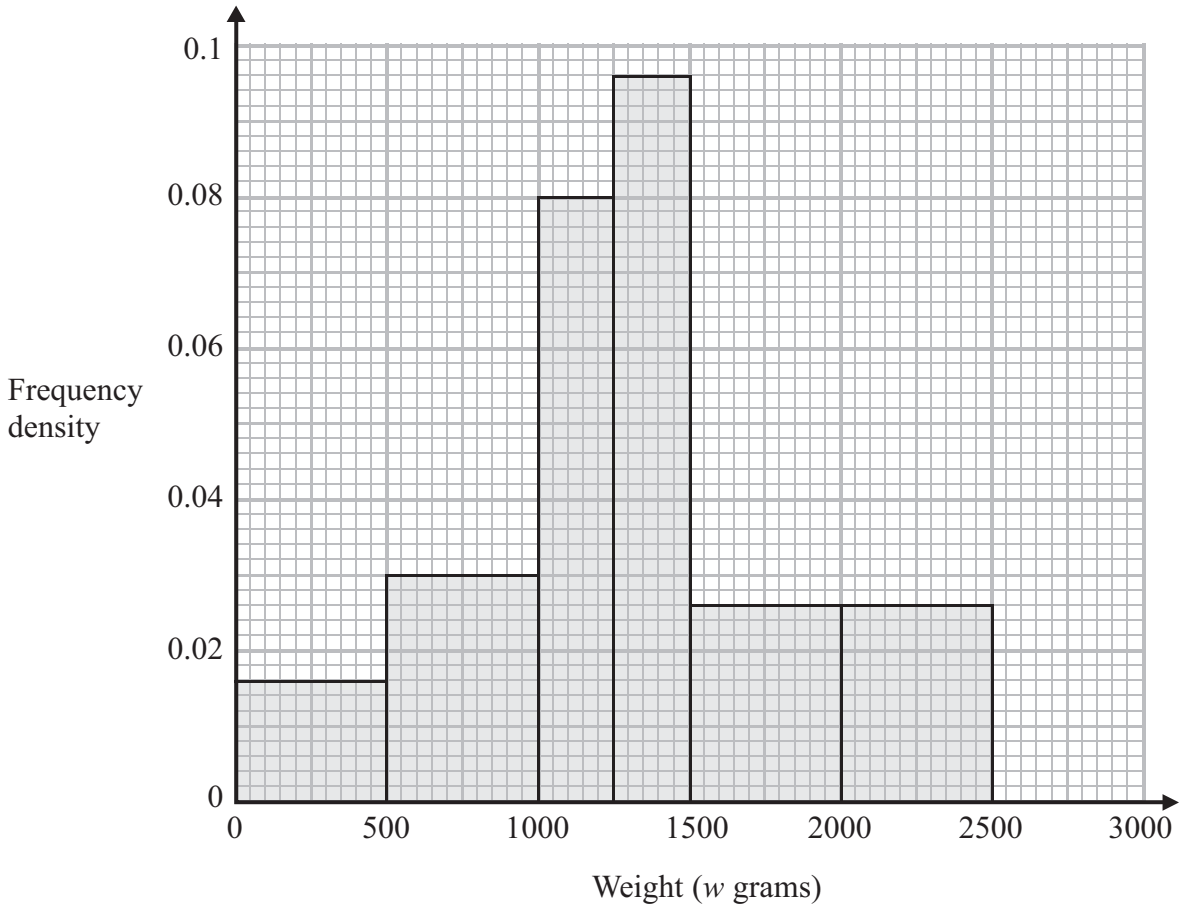
How many people aged 75 – 79 should be in the sample?

.....

(Total for Question 13 is 3 marks)

14 Jim went on a fishing holiday.

The histogram shows some information about the weights of the fish he caught.



(a) Use the histogram to complete the frequency table.

Weight (w grams)	Frequency
$0 < w \leqslant 500$	8
$500 < w \leqslant 1000$	
$1000 < w \leqslant 1250$	
$1250 < w \leqslant 1500$	
$1500 < w \leqslant 2500$	

(2)

Jim kept all the fish he caught with a weight greater than 2000 g.

(b) Find the ratio of the number of fish Jim kept to the total number of fish he caught.

.....

(2)

(c) Use the histogram to find an estimate of the median.

..... g

(2)

(Total for Question 14 is 6 marks)

15 Jeremy has 10 socks.

6 of the socks are red
2 of the socks are blue
2 of the socks are green

Jeremy takes at random two of the socks.

Work out the probability that he takes two socks of the same colour.

.....

(Total for Question 15 is 4 marks)

TOTAL FOR PAPER IS 60 MARKS

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