

Write your name here

Surname

Other names

Pearson
Edexcel GCSE

Centre Number

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Candidate Number

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Mathematics B

Unit 1: Statistics and Probability (Calculator)

Higher Tier

Monday 9 June 2014 – 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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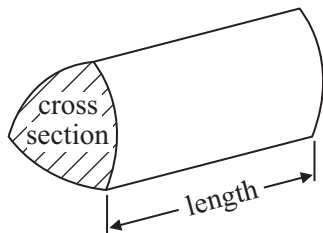
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GCSE Mathematics 2MB01

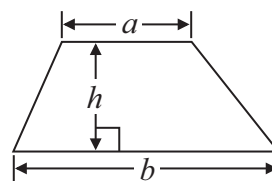
Formulae: Higher Tier

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 $\times$ length

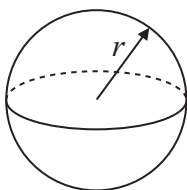


Area of trapezium = $\frac{1}{2} (a + b)h$



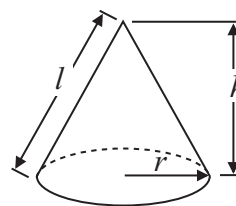
Volume of sphere = $\frac{4}{3} \pi r^3$

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

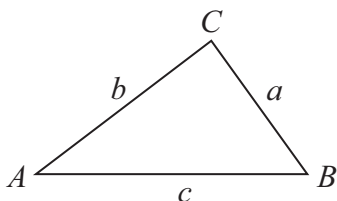


Volume of cone = $\frac{1}{3} \pi r^2 h$

Curved surface area of cone = $\pi r l$



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** Shemoly wants to find out how often people play sport.
She uses this question on a questionnaire.

“Exercise is good for you. How often do you play sport?”

A lot ☐ Sometimes ☐ Never ☐

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

1

.....

.....

2

.....

.....

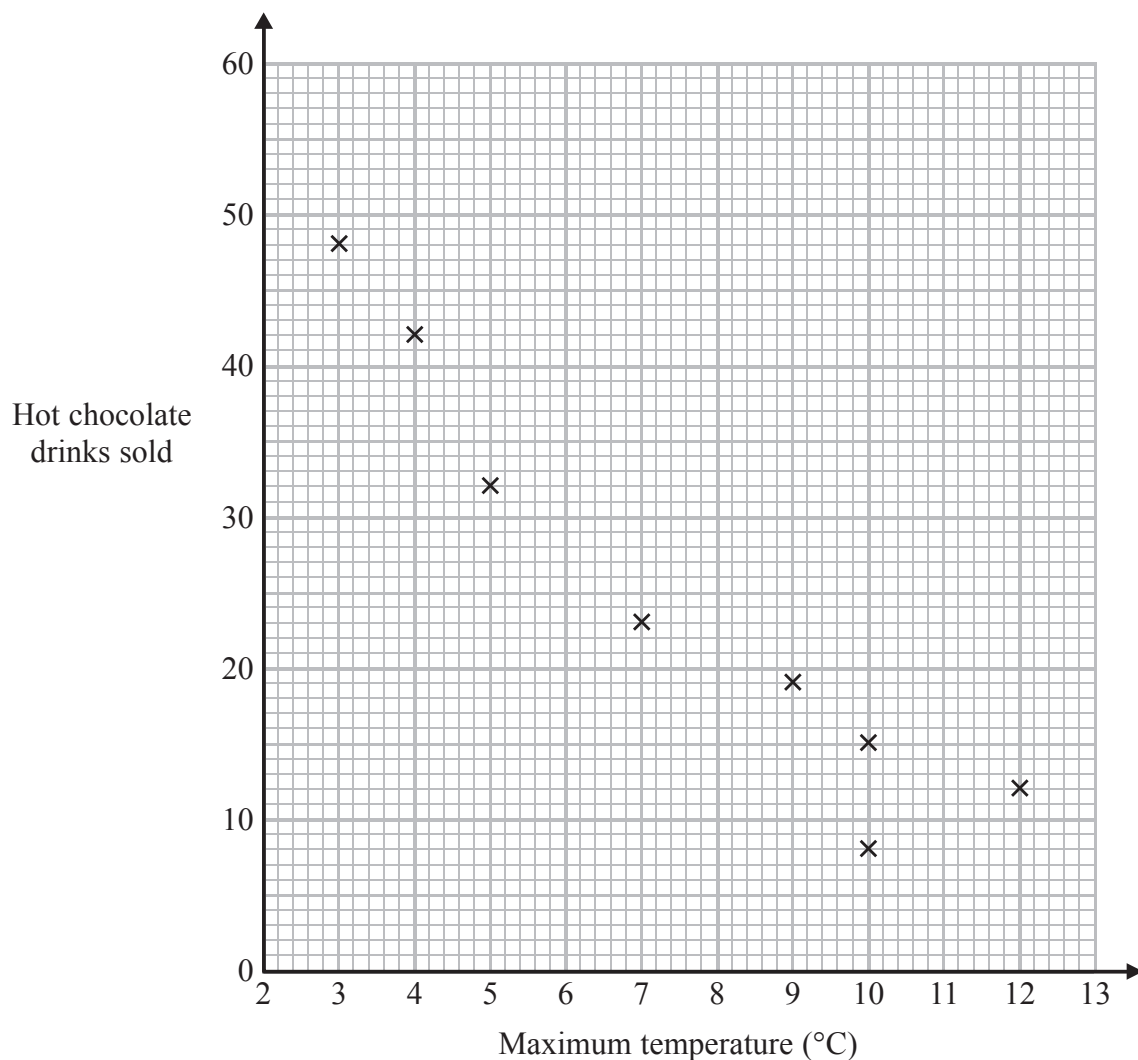
(Total for Question 1 is 2 marks)



2 Carlos has a cafe in Clacton.

Each day, he records the maximum temperature in degrees Celsius ($^{\circ}\text{C}$) in Clacton and the number of hot chocolate drinks sold.

The scatter graph shows this information.



On another day the maximum temperature was 6°C and 35 hot chocolate drinks were sold.

(a) Show this information on the scatter graph.

(1)

(b) Describe the relationship between the maximum temperature and the number of hot chocolate drinks sold.

(1)



(c) Draw a line of best fit on the scatter diagram.

(1)

One day the maximum temperature was 8 °C.

(d) Use your line of best fit to estimate how many hot chocolate drinks were sold.

.....
(1)

(Total for Question 2 is 4 marks)

3 On Monday, a shop sells 120 loaves of bread.

20% of the loaves are wholemeal bread.

$\frac{1}{3}$ of the loaves are granary bread.

The rest of the loaves are white bread.

How many loaves of white bread does the shop sell on Monday?

.....
(Total for Question 3 is 3 marks)



***4** 140 children will be at a school sports day.
Lily is going to give a cup of orange drink to each of the 140 children.
She is going to put 200 millilitres of orange drink in each cup.

The orange drink is made from orange squash and water.
The orange squash and water are mixed in the ratio 1 : 9 by volume.

Orange squash is sold in bottles containing 750 millilitres.

Work out how many bottles of orange squash Lily needs to buy.
You must show all your working.

(Total for Question 4 is 4 marks)



- 5 There are 20 sweets in a box.
 x of the sweets are red.
The rest of the sweets are yellow.

Tom takes at random a sweet from the box.

Write down an expression, in terms of x , for the probability that Tom takes a yellow sweet.

.....
(Total for Question 5 is 2 marks)

- 6 Dionne has 60 golf balls.
Each of these golf balls weighs 42 grams to the nearest gram.
Work out the greatest possible total weight of all 60 golf balls.
Give your answer in kilograms.

..... kg

(Total for Question 6 is 3 marks)

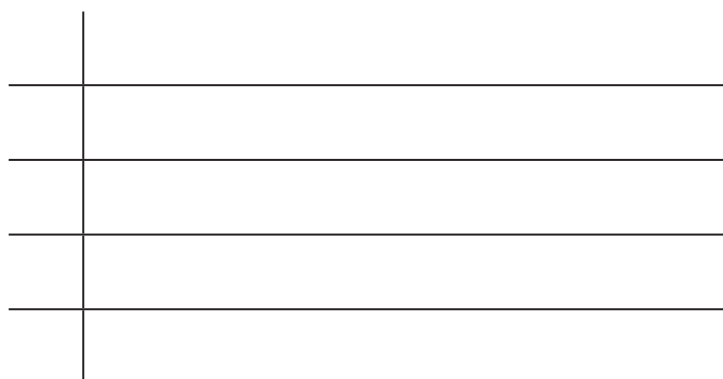


7 A leisure centre has a swimming pool and a gym.

Here are the ages of the 16 people in the swimming pool.

54	43	15	16	42	23	20	18
36	32	45	10	14	45	13	46

(a) Show this information in an ordered stem and leaf diagram.



(3)



There are 15 people in the gym.

Here are the ages of the 15 people.

18	19	20	21	27	29	32	34
35	36	39	39	42	44	45	

*(b) Compare the ages of the people in the swimming pool with the ages of the people in the gym.

(3)

(Total for Question 7 is 6 marks)



8 Ali throws a biased dice 200 times.

The table shows information about his results.

Score	Frequency
1	47
2	4
3	25
4	56
5	38
6	30

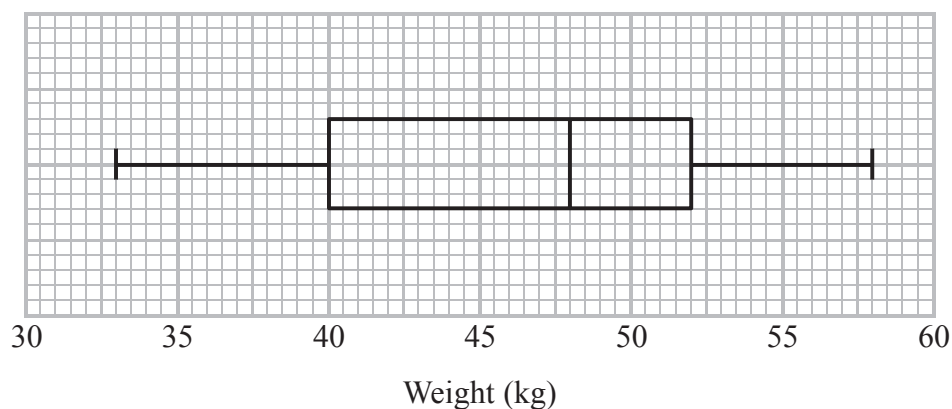
Charlie throws the dice 550 times.

Work out an estimate for the total number of times that Charlie will get a score of 4

.....
(Total for Question 8 is 3 marks)



- 9 The box plot gives information about the weights of a group of children.



- (a) Write down the median.

..... kg
(1)

- (b) Work out the interquartile range.

..... kg
(1)

There are 80 children in the group.

- (c) Work out an estimate for the number of children who weigh 52 kg or more.

.....
(2)

(Total for Question 9 is 4 marks)



10 The table shows some information about the times, in minutes, 60 people took to get to work.

Time (x minutes)	Frequency		
$0 < x \leq 10$	5		
$10 < x \leq 30$	11		
$30 < x \leq 50$	23		
$50 < x \leq 80$	13		
$80 < x \leq 100$	8		

(a) Calculate an estimate for the mean.

..... minutes
(4)

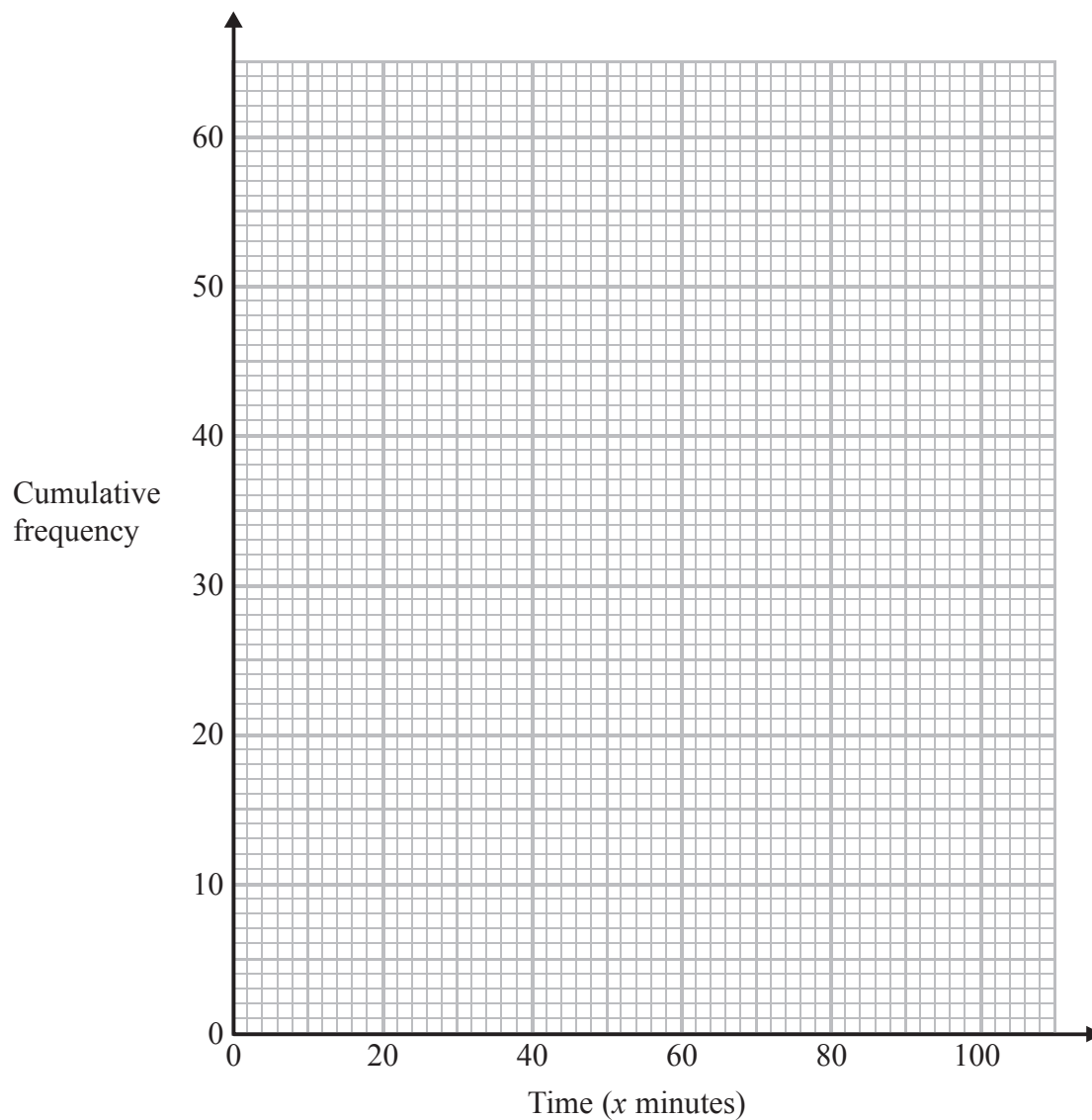
(b) Complete the cumulative frequency table.

Time (x minutes)	Cumulative frequency
$0 < x \leq 10$	
$0 < x \leq 30$	
$0 < x \leq 50$	
$0 < x \leq 80$	
$0 < x \leq 100$	

(1)



(c) On the grid draw a cumulative frequency graph for your table.



(2)

(d) Find an estimate for the number of people who took **more** than 1 hour to travel to work.

(2)

(Total for Question 10 is 9 marks)



- 11** There are 10 boys and 20 girls in Mrs Brook's class.
Mrs Brook gave all the class a test.

The mean mark for all the class is 60

The mean mark for the girls is 56

Work out the mean mark for the boys.

.....
(Total for Question 11 is 3 marks)

- 12** The value of a van depreciates at the rate of 20% per year.

Gary buys a new van for £27 500

After n years the value of the van is £11 264

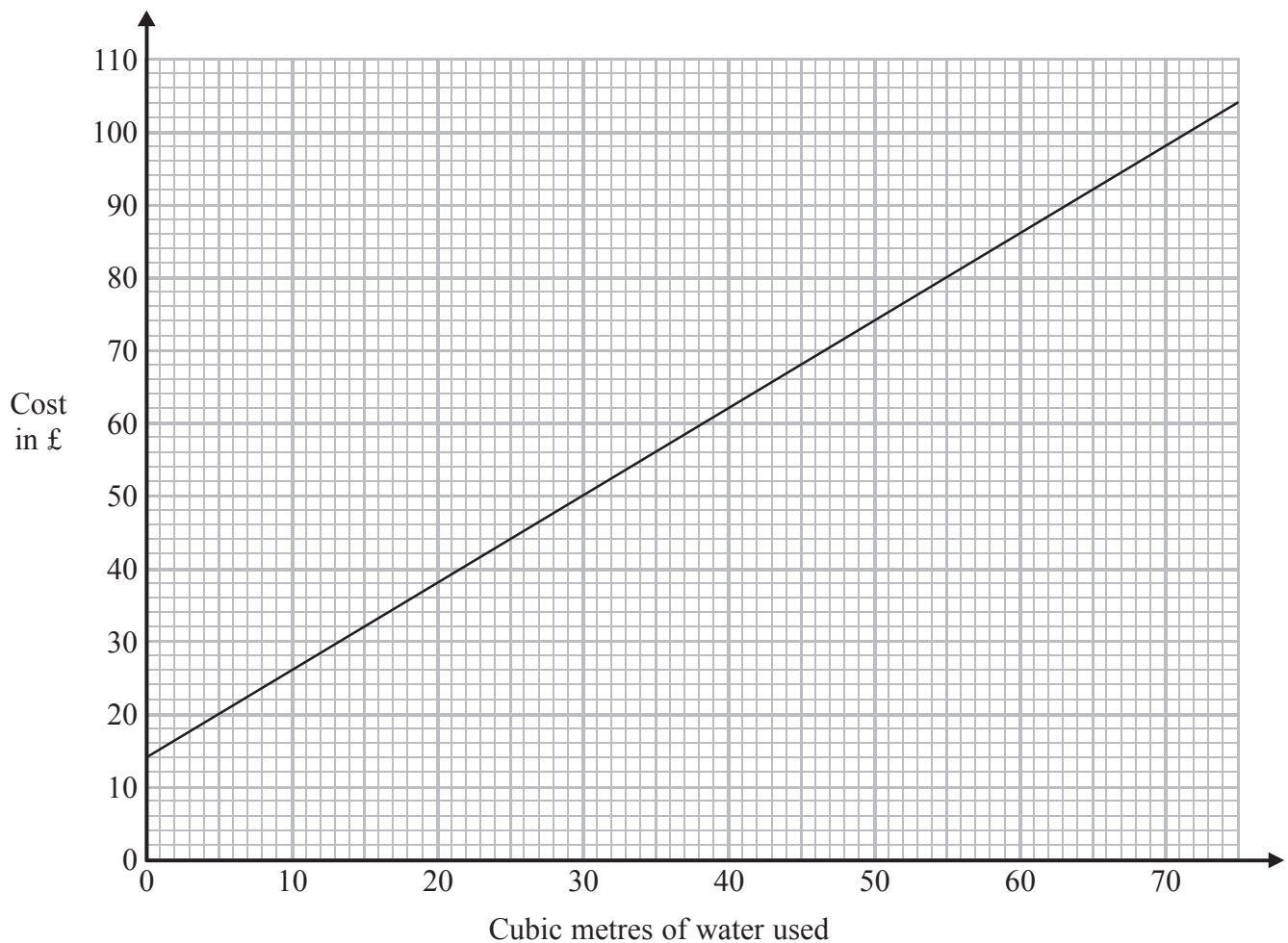
Find the value of n .

.....
(Total for Question 12 is 2 marks)



- 13** A water company charges customers a fixed standing charge plus an additional cost for the amount of water, in cubic metres, used.

The graph shows information about the total cost charged.



- (a) Write down the fixed standing charge.

£
(1)

- (b) Work out the additional cost for each cubic metre of water used.

£
(2)

(Total for Question 13 is 3 marks)



14 The table shows some information about the students in a school.

Age	Number of male students	Number of female students	Total number of students
16	90	85	175
17	110	115	225
18	87	117	204
19	104	76	180
20 and over	123	127	250
Total number of students	514	520	1034

Alice wants to give a questionnaire to some of these students.
She takes a sample of 150 students stratified by age and gender.

Work out the number of 18-year-old female students there should be in the sample.

(Total for Question 14 is 2 marks)



15 There are 10 cakes on a plate.

1 fruit slice
6 doughnuts
3 iced buns

Barry takes a cake at random and eats it.
He then takes at random a second cake.

Work out the probability that Barry takes two different types of cake.

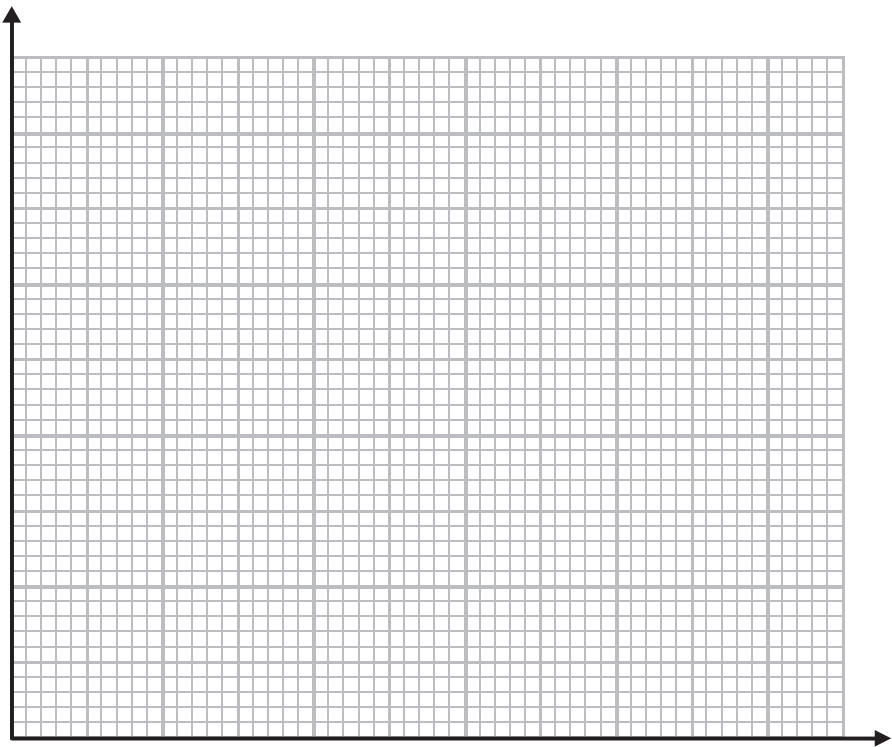
.....
(Total for Question 15 is 4 marks)



16 The table shows some information about the total rainfall, in millimetres, recorded at 85 weather stations one month.

Rainfall (mm)	Frequency
$0 < x \leq 20$	16
$20 < x \leq 30$	27
$30 < x \leq 45$	36
$45 < x \leq 50$	6

(a) Draw a histogram for this information.



(3)

(b) One of the weather stations is selected at random.
Work out the probability that the rainfall recorded was over 40 mm.

(3)

(Total for Question 16 is 6 marks)

TOTAL FOR PAPER IS 60 MARKS



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