Write your name here

Surname	Other names

Edexcel GCSE

Centre Number   Candidate Number

Mathematics B
Unit 1: Statistics and Probability (Calculator)

Higher Tier

Tuesday 6 November 2012 – Morning
Time: 1 hour 15 minutes

Paper Reference
5MB1H/01

Total Marks

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

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.
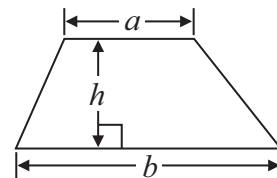- Check your answers if you have time at the end.

Turn over ▶

PEARSON

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.
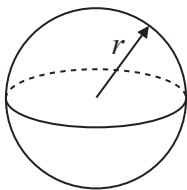
Volume of prism = area of cross section × length
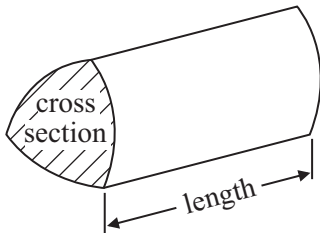
Area of trapezium = $\frac{1}{2}(a + b)h$

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 = $\pi r l$
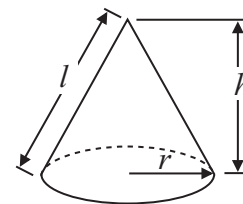
In any triangle *ABC*

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 $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

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

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

1 The list below shows the weight, in grams, of 15 baskets of strawberries.
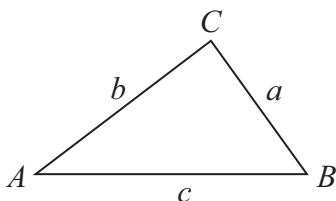
193	200	207	211	198
189	218	195	206	189
223	190	207	205	212

Show this information in an ordered stem and leaf diagram.
You must include a key.
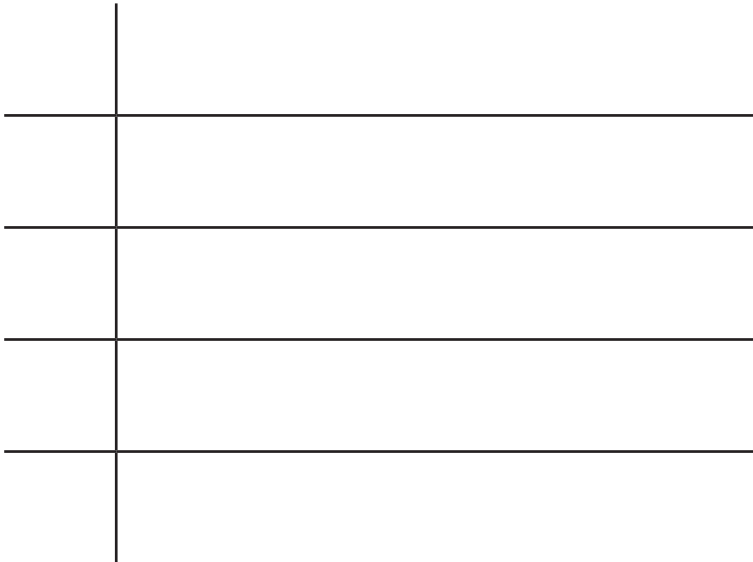
Key:

(Total for Question 1 is 3 marks)

2 Here is a four-sided spinner.
The sides of the spinner are labelled A, B, C and D.
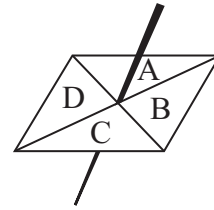
The table shows the probability that the spinner will land on A or on B or on D.

Letter	A	B	C	D
Probability	0.12	0.39		0.18

Amber spins the spinner once.

(a) Work out the probability that the spinner will land on C.

....
(2)

Lucy is going to spin the spinner 50 times.

(b) Work out an estimate for the number of times the spinner will land on A.

....
(2)

(Total for Question 2 is 4 marks)

3 Faisel weighed 50 pumpkins.

The grouped frequency table gives some information about the weights of the pumpkins.

Weight (w kilograms)	Frequency
$0 < w \leqslant 4$	11
$4 < w \leqslant 8$	23
$8 < w \leqslant 12$	14
$12 < w \leqslant 16$	2

Work out an estimate for the mean weight.

.... kg

(Total for Question 3 is 4 marks)

4 A survey was carried out for a magazine.
90 cat owners were asked to write down the make of cat food their cats liked best.

The bar chart shows information about the results.

Make of cat food
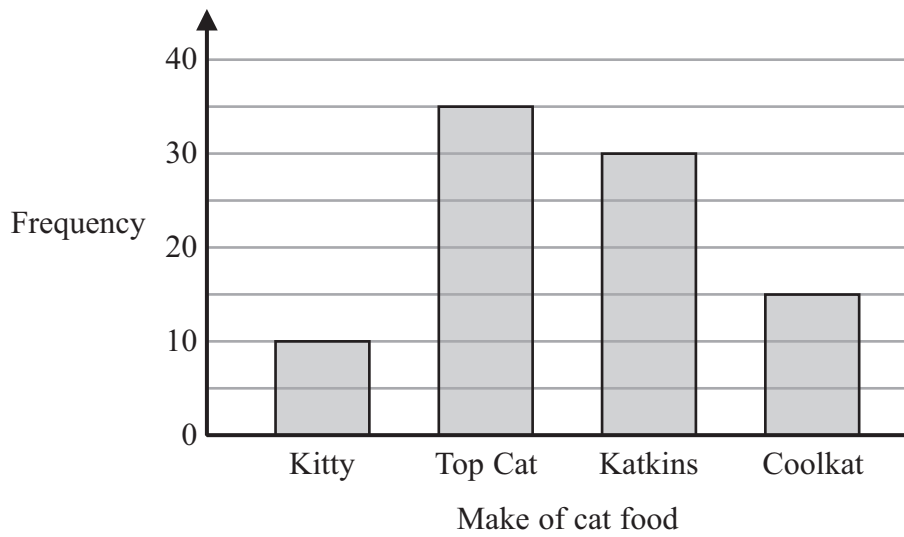
The information in the bar chart is going to be shown in a pie chart.

Use the information in the bar chart to complete the pie chart.
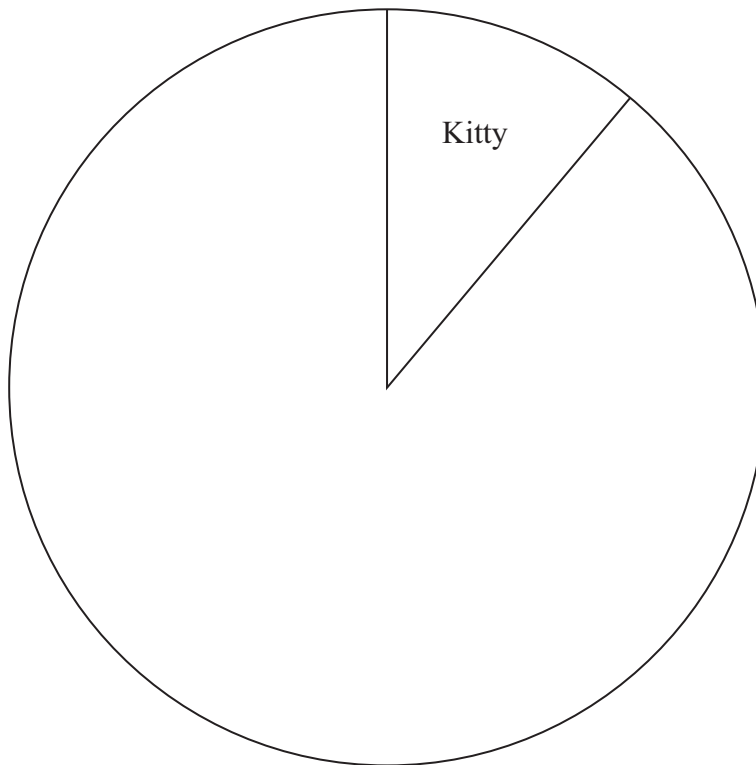
(Total for Question 4 is 3 marks)

5 Some children took part in a piano competition.

Each child was given a mark from Judge A and from Judge B.

The scatter graph below shows some of this information.

Judge B's mark (vertical axis), Judge A's mark (horizontal axis)
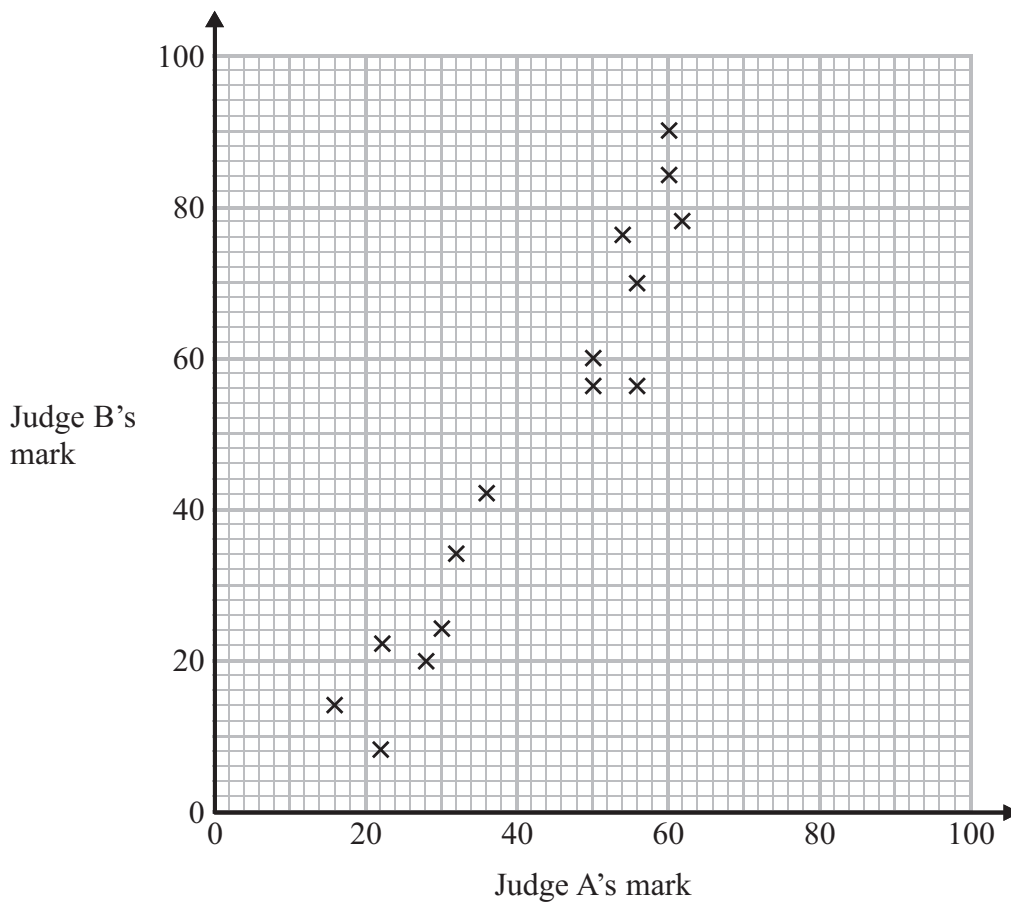
(a) Describe the correlation.

....

(1)

Judge A gives 44 marks to another child.

(b) Use the scatter graph to estimate Judge B's mark for this child.

.... marks

(2)

(Total for Question 5 is 3 marks)

6 There are 200 students at a college.
Each student studies one of Art, Graphics or Textiles.

Of the 116 female students, 26 study Graphics.
22 male students study Textiles.
A total of 130 students study Art.

The number of students who study Graphics is the same as the number of students who study Textiles.

Work out how many **male** students study Art.

....

(Total for Question 6 is 4 marks)

7 There are female and male students at a disco.

One of these students is chosen at random.

The probability that this student is male is $\frac{2}{5}$

There are 96 female students at the disco.

Work out the total number of students at the disco.

....

(Total for Question 7 is 3 marks)

*8   Joan is planning a skiing holiday in Hinterglemm for herself and her two children.
They are going skiing for 6 days.

The table shows the costs of ski hire, of boot hire and of buying lift passes in two shops in Hinterglemm.
All prices are in Euros.

Shop A

		Ski hire	Boot hire	Lift pass
Adult	6 days	111	53	236
	13 days	168	90	314
Child	6 days	78	52	165
	13 days	122	87	210

Shop B

		Ski hire	Boot hire	Lift pass
Adult	6 days	108	54	242
	13 days	170	89	324
Child	6 days	68	48	160
	13 days	118	85	205

Joan will use her own skis and her own boots.

For 6 days she will need
            to hire skis for each of her two children
            to hire boots for each of her two children
    and   to buy lift passes for herself and each of her two children.

Shop A gives 5% off the total cost.
Shop B gives 3% off the total cost.

Joan wants to hire the skis and boots and buy the lift passes from the same shop.
She wants to get everything from the cheaper shop.

Which shop is cheaper for Joan?
You must show all your working.

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(Total for Question 8 is 5 marks)

9 Nathan is doing a survey about DVDs.
He writes a questionnaire.

Nathan decides to hand out his questionnaire to the women who are inside a DVD store.

His sample is biased.

(a) Give **two** possible reasons why.

1 ....

....

2 ....

....

(2)

This is one of the questions on Nathan's questionnaire.

How many DVDs do you have?

☐   ☐   ☐   ☐

0 to 5   5 to 10   11 to 15   16 to 20

(b) Write down **two** things wrong with this question.

1 ....

....

2 ....

....

(2)

(Total for Question 9 is 4 marks)

10 5 female giraffes have a mean weight of x kg.
7 male giraffes have a mean weight of y kg.

Write down an expression, in terms of x and y, for the mean weight of all 12 giraffes.

....

(Total for Question 10 is 2 marks)

11 Jozef invests £1700 for 2 years at 4% per annum **compound** interest.
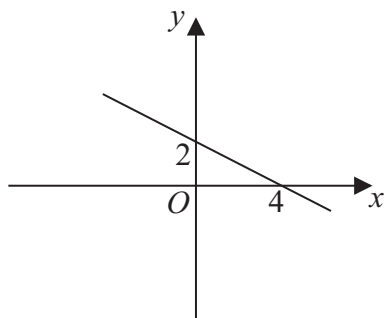
Work out the value of his investment at the end of 2 years.

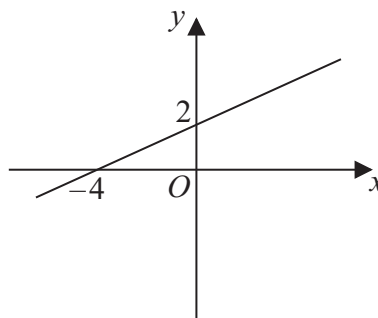£ ....

(Total for Question 11 is 3 marks)

12 Here are the graphs of 6 straight lines.

Graph **A**

Graph **B**
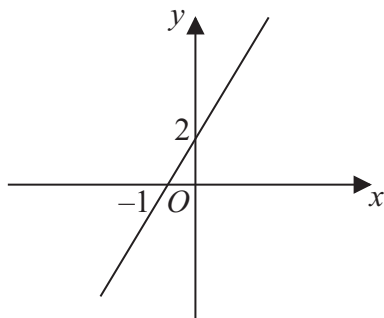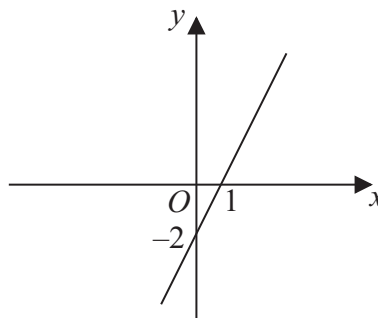

Graph **C**
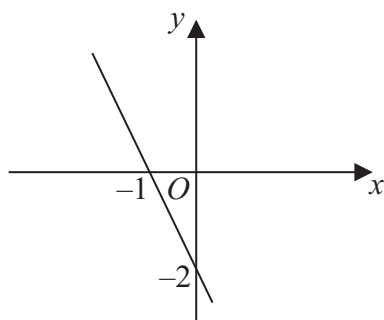
Graph **D**
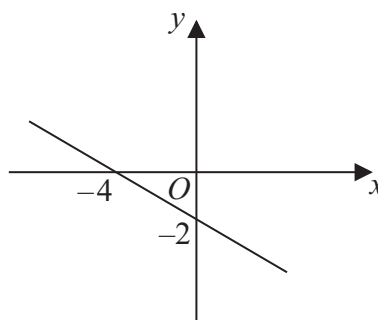
Graph **E**

Graph **F**

Match each of the graphs **A**, **B**, **C**, **D**, **E** and **F** to the equations in the table.

Equation	$y = \dfrac{1}{2}x + 2$	$y = 2x - 2$	$y = -\dfrac{1}{2}x + 2$	$y = -2x - 2$	$y = 2x + 2$	$y = -\dfrac{1}{2}x - 2$
Graph						

(Total for Question 12 is 3 marks)

13 The table gives information about the number of students at a school.

Year 9	Year 10	Year 11	Total
244	315	181	740

Priya is going to survey 60 of the students in the school.
She is going to use a sample stratified by year group.

(a) Work out the number of year 9, year 10 and year 11 students Priya should have in her sample.
You must show all your working.

Year 9 ....

Year 10 ....

Year 11 ....

(3)

Priya is going to use a random sample to select the students.

(b) (i) Explain what is meant by a random sample.

....

....

(ii) Describe how Priya could take a random sample.

....

....
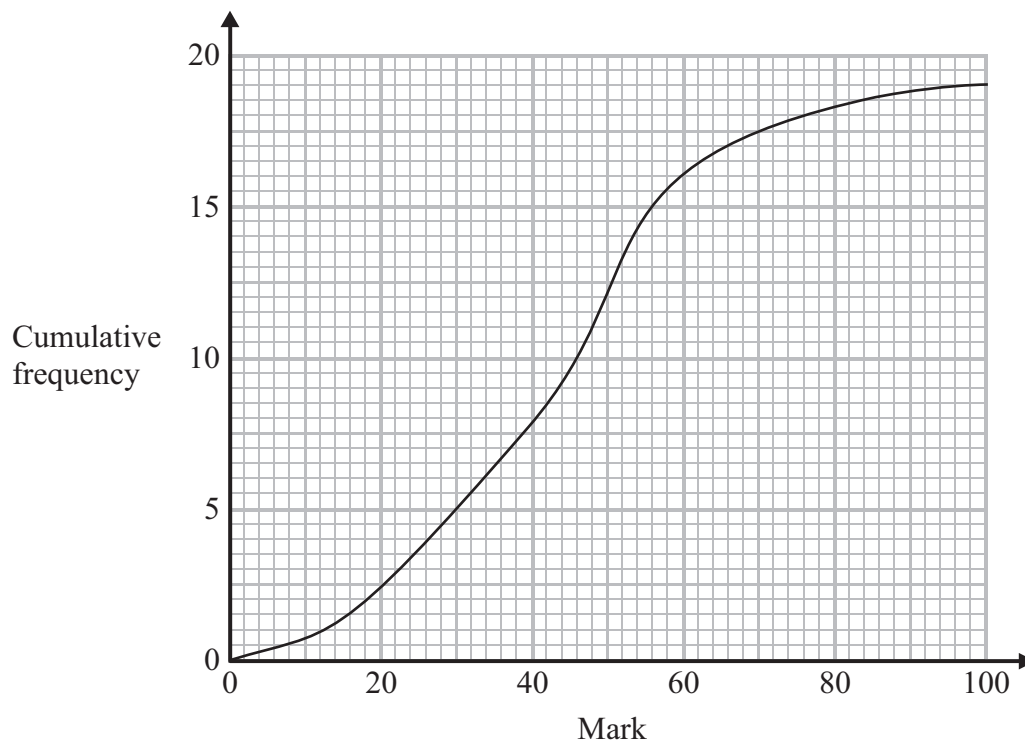
(2)

(Total for Question 13 is 5 marks)

14 Mrs Angus's class did a maths test.

The cumulative frequency graph shows information about their marks.

Mark

(a) Use the cumulative frequency graph to find

   (i) the median,

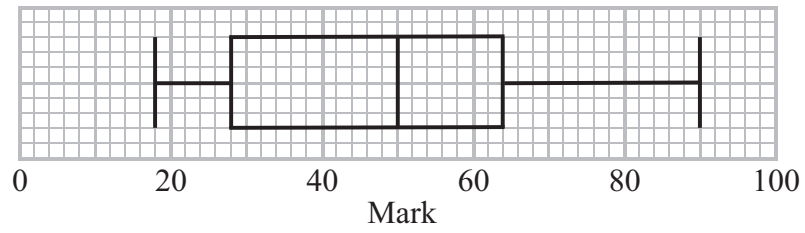   ....

   (ii) the interquartile range.

   ....

   (3)

Mr Wilson's class did the same maths test.

The box plot shows information about their marks.

0   20   40   60   80   100

Mark

*(b) Compare the interquartile range of the marks of Mr Wilson's class with the interquartile range of the marks of Mrs Angus's class.
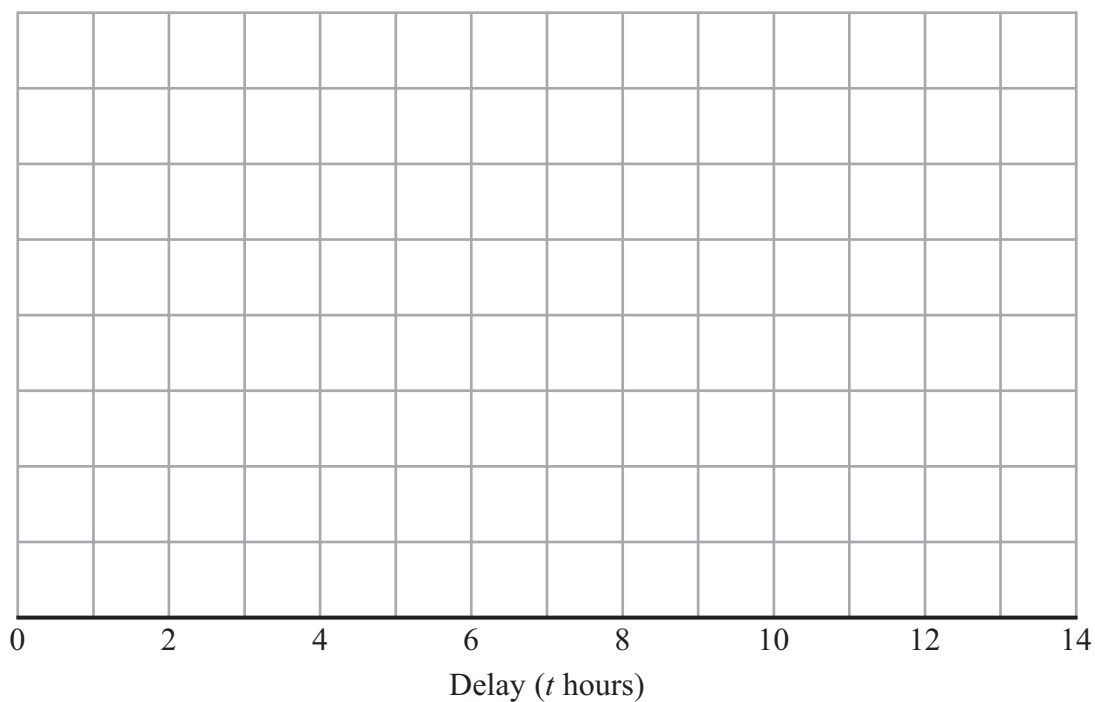
(2)

(Total for Question 14 is 5 marks)

15 During one week in January, the flights from an airport were delayed.

The table shows information about the flight delays on Monday.

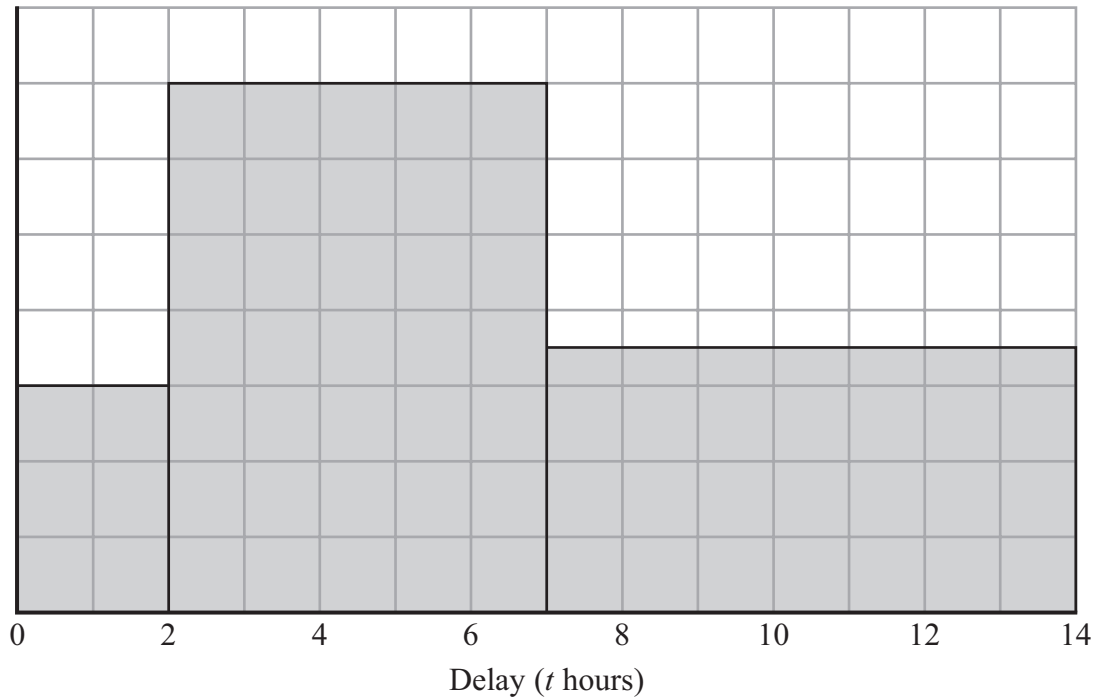| Delay (*t* hours)	Frequency
$0 < t \leqslant 2$	4
$2 < t \leqslant 7$	60
$7 < t \leqslant 11$	40
$11 < t \leqslant 13$	6

(a) Draw a histogram for the information given in the table.

Delay (*t* hours)

(3)

The histogram below shows information about the flight delays on Tuesday.

Delay (*t* hours)

12 flights were delayed for up to 2 hours.

Avi says

"A greater number of flights were delayed for more than 7 hours on Monday than for more than 7 hours on Tuesday."

(b) Is Avi correct?
You must explain your answer.

(2)

(Total for Question 15 is 5 marks)

16 There are ten pens in a box.

4 of the pens are red.
6 of the pens are black.

Josh takes at random a pen from the box.
He puts the pen into his bag.
He then takes at random another pen from the box.

Work out the probability that Josh takes one pen of each colour.

....

(Total for Question 16 is 4 marks)

TOTAL FOR PAPER IS 60 MARKS