Paper Reference(s)

1389

Edexcel GCSE

Statistics

Paper 1F

Foundation Tier

Friday 25 June 2004 – Morning

Time: 2 hours

Materials required for examination	**Items included with question papers**
Ruler graduated in centimetres and millimetres, protractor, pen, HB pencil, eraser, electronic calculator.	Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname and other names and your signature.

Answer **all** questions in the spaces provided in this question paper. **You must NOT write on the formulae page or any blank pages. Anything you write on these pages will gain NO credit.**

If you need more space to complete your answer to any question, use additional sheets.

Information for Candidates

The total mark for this paper is 80.

The marks for the various parts of questions are shown in round brackets: e.g. (**2**).

This question paper has eight questions in Section A and six questions in Section B.

Advice to Candidates

Work steadily through the paper.

Do not spend too long on one question.

Show all stages in any calculations.

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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Edexcel
Success through qualifications

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

Mean of a frequency distribution = $\dfrac{\sum fx}{\sum f}$.

Mean of a grouped frequency distribution = $\dfrac{\sum fx}{\sum f}$, where x is the mid-interval value.

You must write down all stages of your working.

SECTION A

Answer ALL EIGHT questions.

1. The bar chart shows the numbers and makes of cars sold by a garage in one particular week.

Car Sales
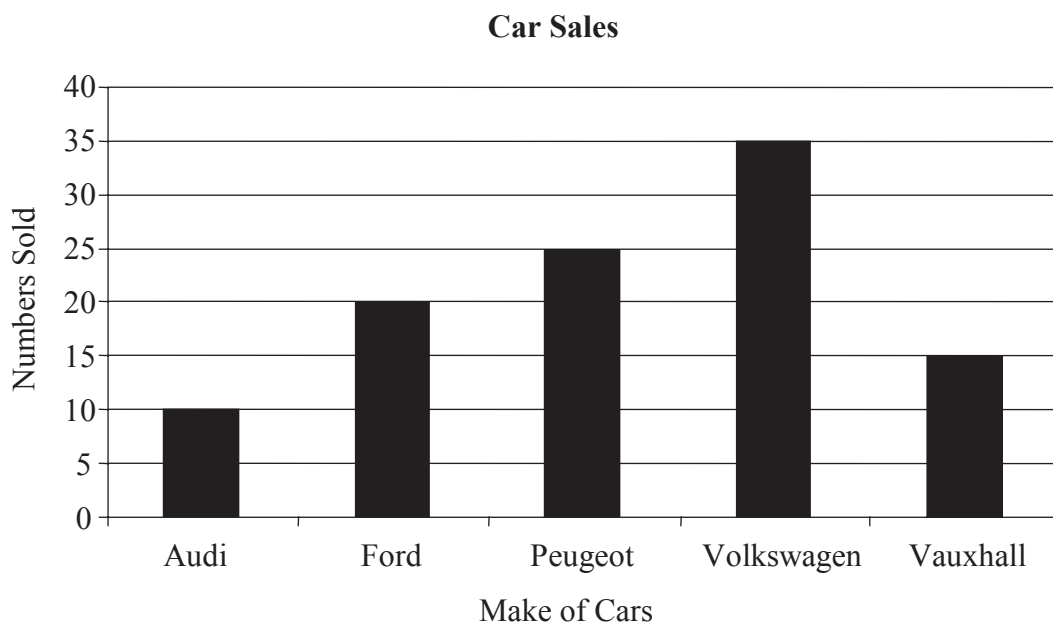
(a) How many Vauxhall cars were sold by the garage?

....
(1)

(b) Which make of car did the garage sell most of?

....
(1)

(c) What was the total number of cars sold by the garage?

....
(1)

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Page Total

2. A hotel owner wants to give his guests information about the number of hours of sunshine they can expect in June.

(a) Write down one way he can collect the information if he wants to use primary data.

....

....

(1)

(b) Write down one way he can collect the information if he wants to use secondary data.

....

....

(1)

(c) Is the data he collects qualitative or quantitative?

....

(1)

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3. The table below is part of a larger table that shows the examination achievements by pupils in 2001/ 2002.

Examination Achievements 2001/ 2002

| | Pupils in the last year of compulsory education | | | | |
| | Percentage achieving GCSE | | | | |
	5 or more grades A*-C	1-4 grades A*-C	Grades D-G only	No graded GCSEs	Total (=100%) (thousands)
United Kingdom	51.0	24.1	19.4	5.5	729.7
North East	43.9	24.8	24.8	6.5	33.3
North West	48.0	24.5	21.7	5.7	89.6
Yorkshire and the Humber	44.4	24.3	25.2	6.2	63.0
East Midlands	49.1	23.1	22.1	5.7	51.6
West Midlands	47.4	25.0	21.9	5.7	67.9
East	54.0	23.3	18.1	4.6	65.4
London	48.6	26.4	19.5	5.5	77.7
South East	55.5	22.3	17.2	5.0	95.9
South West	54.6	22.8	17.8	4.8	58.9

Source: Department of Education and Skills

(a) What percentage of pupils in the North West got 5 or more grades A*– C?

....
(1)

(b) Write down the total number of pupils in the United Kingdom in the last year of compulsory education in 2001/ 2002.

....
(1)

(c) Which region shown in the table had the lowest percentage of pupils with no graded GCSEs?

....
(1)

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Page Total

4. The proportions of oak, elm and beech trees in Beckham's Wood in 1950 and 2000 are shown in the pie charts below.

1950

Oak

Beech

Elm

2000

Oak

Beech

Elm
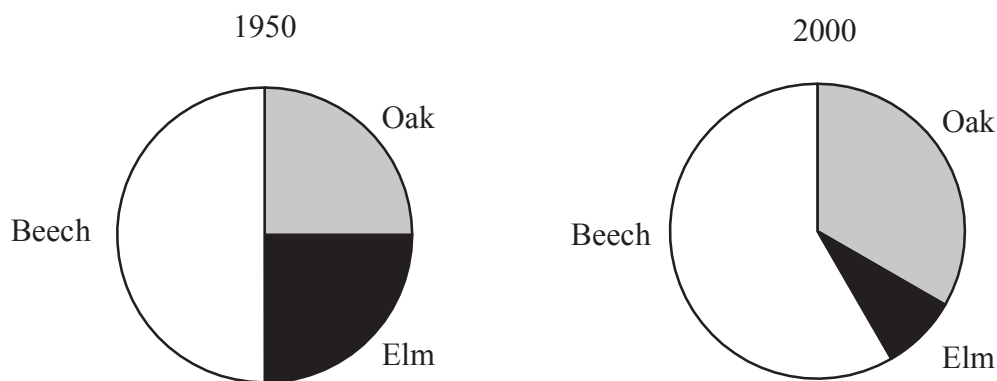
Between 1950 and 2000 many of the elm trees in Britain were killed by Dutch elm disease.

(a) Write down one feature in the pie charts that suggests that Beckham's Wood could be in Britain.

....

....

(1)

(b) Emma says

"These pie charts show that the number of beech trees in Beckham's Wood has increased between 1950 and 2000."

Emma is **wrong**.

Explain why.

....

....

(1)

Do not write here

5. The composite bar charts show the percentages of GCSE grades gained by males and by females in England in 2001/2002.
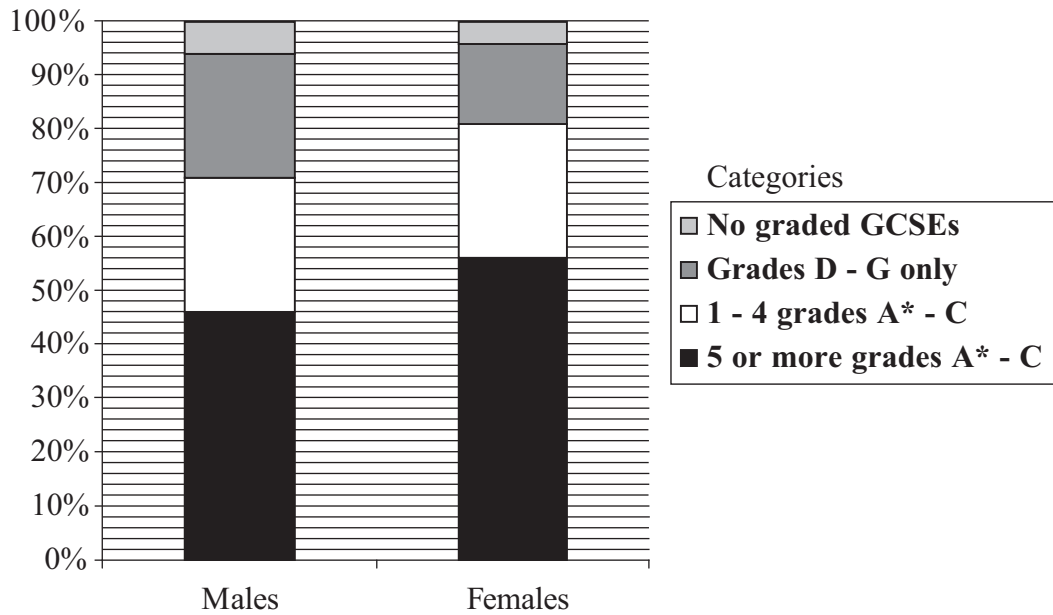
(a) Did males or females have the biggest percentage of 5 or more grades A* – C?

....

(1)

(b) In which category did males and females gain the same percentage?

....

(1)

(c) Work out the percentage of males that gained grades D – G only.

....

(1)

(d) Write down one reason why the choice of shading for the composite bar charts may be visually misleading.

....

....

(1)

6. Sangita wants to buy a second-hand boat. In a magazine she finds 10 advertisements for the type of boat she wants to buy. The scatter diagram shows the age, x years, and the price, £y, of these boats.

Boat Prices
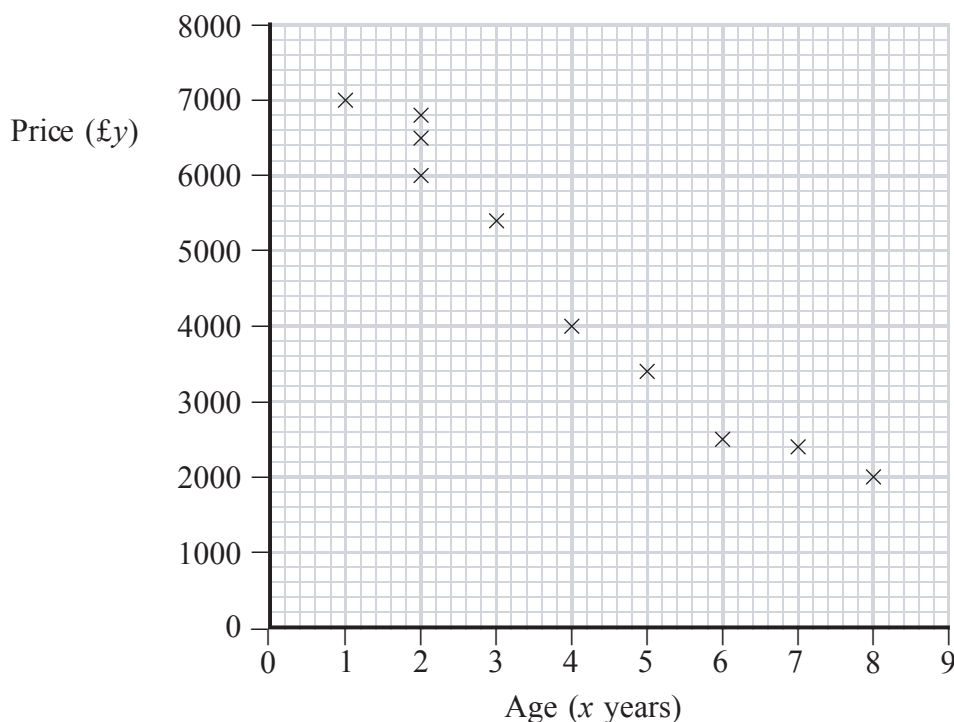
(a) Write down the price of the boat that was 4 years old.

£...
(1)

(b) Describe the correlation between the age and the price of these boats.

....
(1)

The mean point of the data $(\bar{x}, \bar{y}) = (4, 4600)$.

(c) On the scatter diagram

    (i)   plot the point (4, 4600),

    (ii) draw a line of best fit through (4, 4600).
(2)

Sangita can afford to pay £3000 for her boat.

(d) Use your line of best fit to estimate the age of the boat that she can afford to buy.

.... years
(1)

7. The following table shows the population of Hambleton in 1960 and in 1980.

Hambleton

Year	1960	1980
Population	6400	7040

(a) Taking 1960 as the base year, work out the population of Hambleton in 1980 as an index number.

....
(2)

Thorpe is a town near to Hambleton.

The population of Thorpe decreased by 2% between 1970 and 1990.

(b) Taking 1970 as the base year, complete the table below.

Thorpe

Year	1970	1990
Index number		

(2)

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Page Total

8. Peter takes a random sample of sentences from Book A and from Book B. He counts the number of words per sentence.

The box plots summarise his results.

Number of words in a sentence
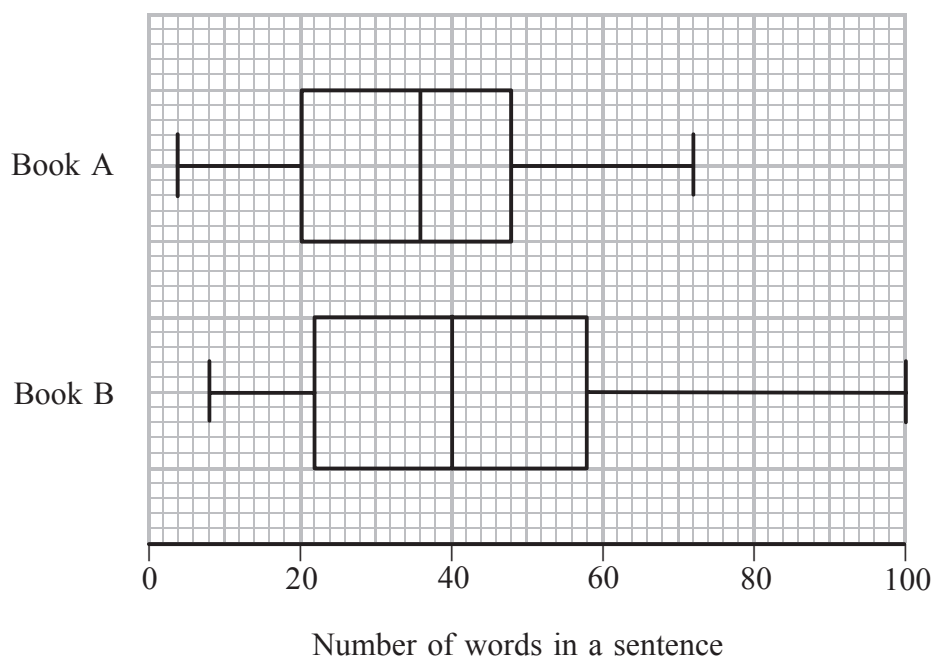
(a) Write down the median number of words per sentence for Book B.

....

(1)

(b) Work out the inter-quartile range of the number of words per sentence for Book A.

....

(1)

Peter says that these books were written by different authors.

(c) Write down two ways the box plots show this.

(i) ....

....

(ii) ....

....

(2)

TOTAL FOR SECTION A: 28 MARKS

Do not write here

SECTION B

Answer ALL SIX questions.

9.   The manager at McKings restaurant asked 30 customers as they left

"How many meals have you had here in the last seven days?"

The results are given below.

1	2	3	1	1	4	1	1	2	4
1	1	1	5	2	1	2	3	1	2
3	1	2	1	3	2	1	1	3	2

(a) Use this data to complete the table.

Number of meals	Tally	Frequency
1		
2		
3		
4		
5		

(2)

McKings served 900 customers on the day of the manager's survey.

(b) Using the results of the manager's survey, estimate how many of the 900 customers had exactly **two** meals at McKings in the last seven days. Show your working.

....
(2)

(c) Write down two ways in which the 30 customers might **not** be a representative sample of the people that eat at McKings restaurant.

(i)   ....

....

(ii) ....

....
(2)

Page Total

10. During one milking session a farmer records the amount of milk, in litres, collected from each of his cows. The results are shown below.

    12   18   26   28   28   31   34   34   34   42   43

(a) Complete the ordered stem and leaf diagram below.

Amount of Milk   Key: 1 | 2 = 12 litres

    1 |
    2 |
    3 |
    4 |

(2)

(b) Write down the modal amount of milk collected from the cows.

.... litres

(1)

(c) Write down the median amount of milk collected from the cows.

.... litres

(1)

(d) Work out the mean amount of milk collected from the cows.

.... litres

(2)

(e) Work out the inter-quartile range for the amount of milk collected from the cows.

.... litres

(2)

Buttercup produced 12 litres of milk.

In the next milking session Buttercup produced more than 12 litres of milk.

The amount produced by the other cows remained the same.

(f) What effect would this have on the mean amount of milk produced by all the cows? Explain your answer.

....

....

(2)

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11. Abbey Road MOT testing station carried out 30 MOT tests.

15 cars failed because of lighting faults and independently 6 cars failed because of steering faults.

A car is chosen at random from the 30 tested.

(a) On the probability scale below,

    (i) use L to mark the probability that the car fails because of lighting faults,

    (ii) use S to mark the probability that the car fails because of steering faults.

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├───────────────────────────────────────────┤
0                                            1
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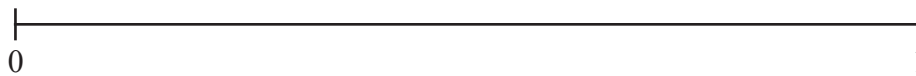
(2)

(b) Complete the probability tree diagram below.
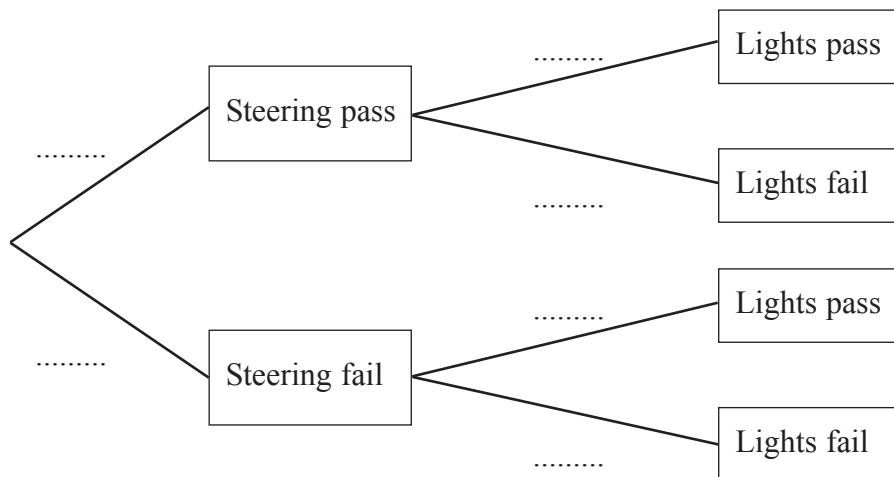
(2)

(c) (i) Work out the probability that the car had both steering and lighting faults.

....

    (ii) Work out the probability that the car had only one of these faults. You must show your working.

....

(4)

Page Total

12. The table shows the number of houses sold by Houses Direct in successive four-month periods in the years 2001 to 2003.

Year	Period	Number of houses	Three-point moving average
2001	1	9	
	2	26	(9 + 26 + 19) ÷ 3 = 18
	3	19	(26 + 19 + 12) ÷ 3 = 19
2002	1	12	(19 + 12 + 32) ÷ 3 = 21
	2	32	
	3	22	
2003	1	15	
	2	38	
	3	25	

(a) (i) Complete the table.

   (ii) Plot the moving averages on the graph below.
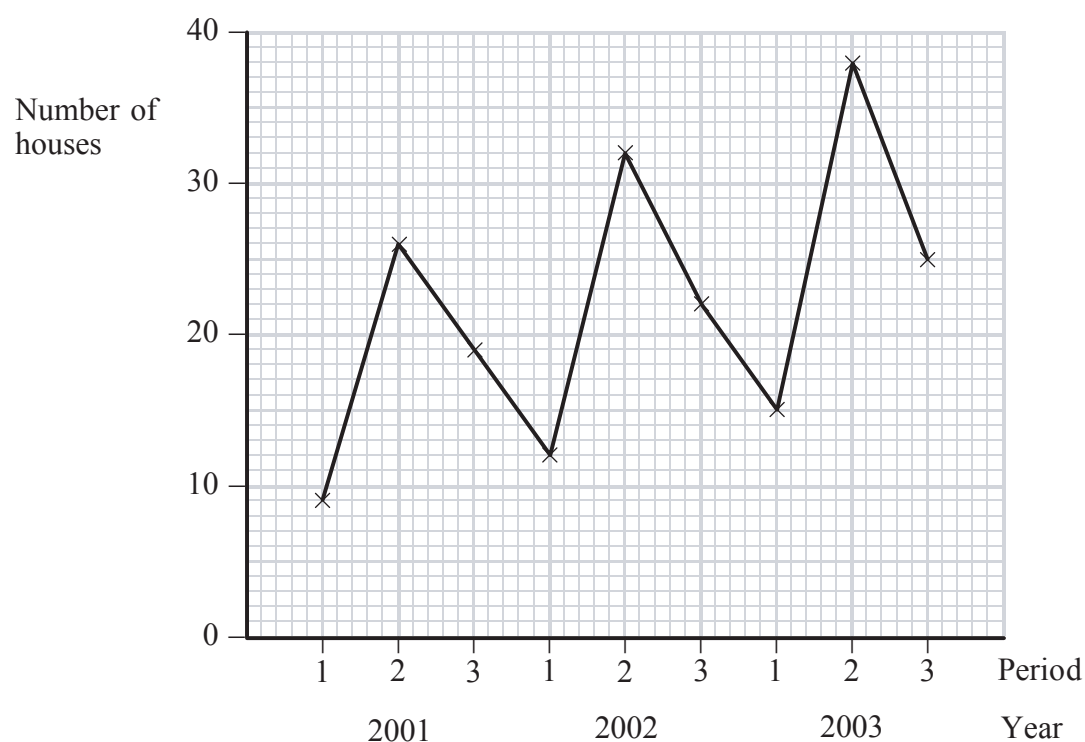
(4)

There was an increase in the number of houses sold in some areas of England in the years 2001 to 2003.

It is claimed that Houses Direct is in one of these areas.

(b) (i) Write down one reason why this claim might be true.

....

....

....

(ii) Write down one reason why this claim might be false.

....

....

....

(2)

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Page Total

13. (a) Explain what a census is.

....

....

(1)

(b) Give two reasons why a person may take a sample rather than a census.

(i) ....

....

(ii) ....

....

(2)

Ashton Girls school wants to take a sample of 100 of its students to find out what they think about compulsory games. There are five year-groups in the school. Each year-group has the same number of students.

Ashton Girls school wants the sample to be representative of the whole school.

(c) Describe how the school should select the sample.

....

....

....

....

(2)

The school is to ask selected students to fill in a questionnaire.

(d) Give two reasons why a pilot survey should be carried out first.

(i) ....

....

(ii) ....

....

(2)

One question on the questionnaire is

"Do you agree that compulsory games are good for you?"

(e) This question is biased. Give one reason why.

....

(1)

It is suggested that it might be better to interview the students rather than asking them to fill in a questionnaire.

(f) Write down one advantage and one disadvantage of interviewing the students.

Advantage ....

....

....

....

Disadvantage ....

....

....

....

(2)

Do not write here

Page Total

14. The table gives information about the typing speed, in words per minute, of a random sample of 60 typists at a typing agency.

Typing speed	Number of typists	Mid-interval value	
$30 < x \le 40$	10	35	
$40 < x \le 50$	22		
$50 < x \le 60$	14		
$60 < x \le 70$	10		
$70 < x \le 80$	4		
		Total	

(a) Work out an estimate for the mean typing speed.
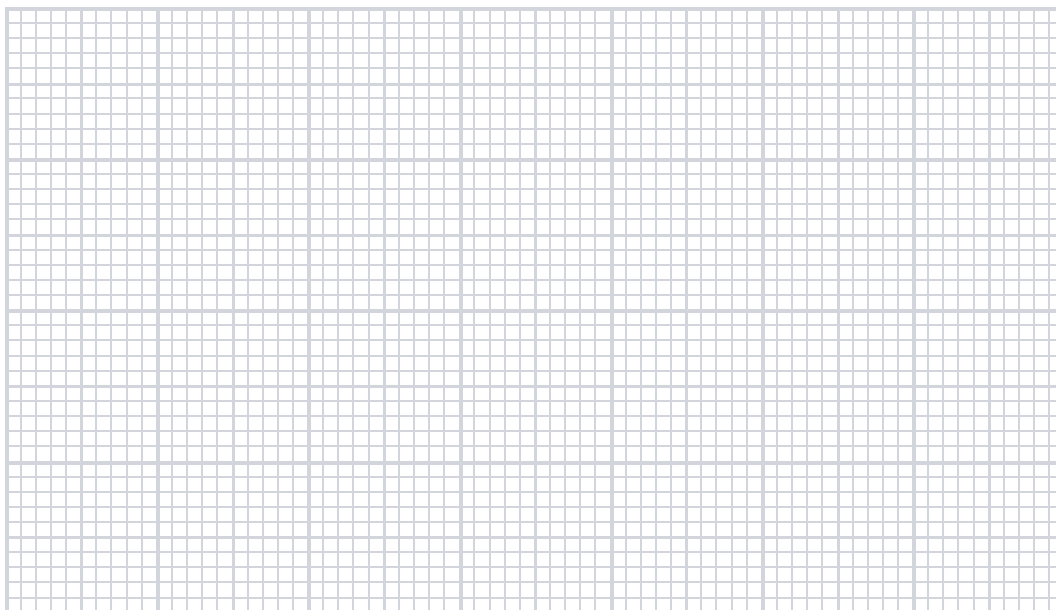
....

(4)

(b) Use the information in the table above to complete the cumulative frequency table below.

Typing speed	Cumulative frequency
$30 < x \le 40$	10
$30 < x \le 50$	
$30 < x \le 60$	
$30 < x \le 70$	
$30 < x \le 80$	

(1)

(c) Draw a cumulative frequency diagram to represent this information.

(3)

(d) Use your cumulative frequency diagram to find an estimate of the median typing
speed.

....
(2)

The agency manager claims that the average speed of his typists is 50 words per minute.

(e) Do you think that this claim is justified? Write down two reasons for your answer.

....

Reason 1 ....

....

....

Reason 2 ....

....

....
(2)

TOTAL FOR SECTION B: 52 MARKS

TOTAL FOR PAPER: 80 MARKS

END

Page Total

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