

Centre No.						Paper Reference	Surname		Initial(s)
Candidate No.						1 3 8 9 / 1 F	Signature		

Paper Reference(s)

**1389/1F**

**Edexcel GCSE**

**Statistics**

**Paper 1F**

**Foundation Tier**

Thursday 22 June 2006 – Morning

Time: 2 hours

Examiner's use only

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Team Leader's use only

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NC001946027

Question Number	Leave Blank
Section A	
1	
2	
3	
4	
5	
6	
7	
Section B	
1	
2	
3	
4	
5	
6	
Total	

**Materials required for examination**

Ruler graduated in centimetres and millimetres, protractor, pen, HB pencil, eraser, electronic calculator.

**Items included with question papers**

Nil

**Instructions to Candidates**

In the boxes above, write your centre number, candidate number, your surname, initials and signature. Check that you have the correct question paper.

Answer ALL the questions. Write your answers 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 answer sheets.

**Information for Candidates**

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

This question paper has 7 questions in Section A and 6 questions in Section B. The total mark for this paper is 80.

There are 24 pages in this question paper. Any blank pages are indicated.

**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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## GCSE Statistics 1389

### Foundation Tier Formulae

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

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

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

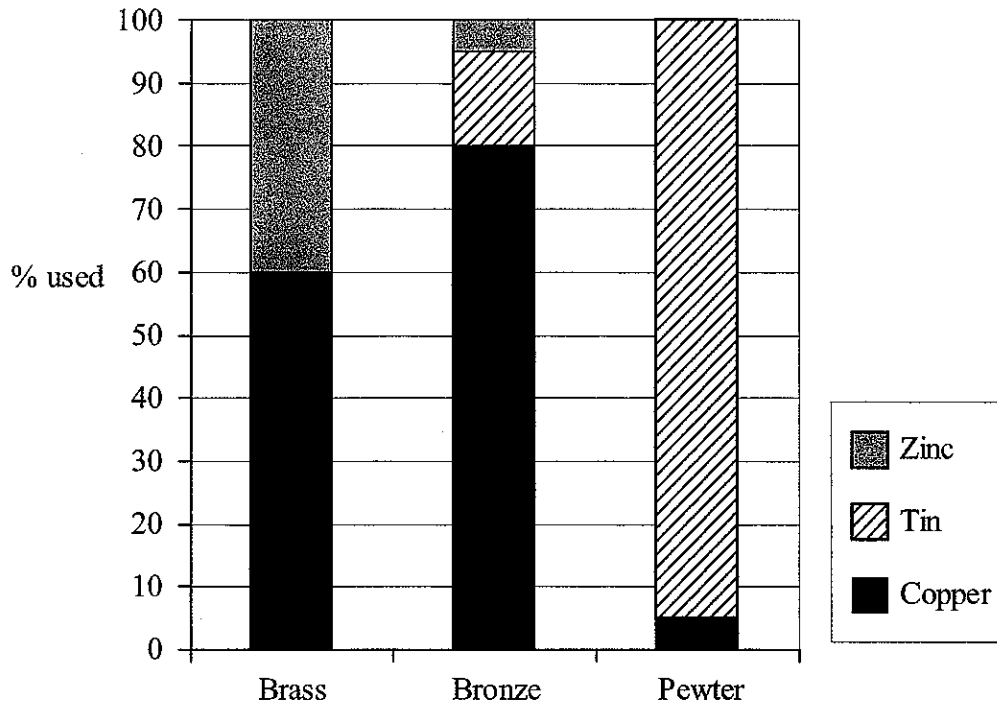


**SECTION A**

Answer ALL the questions. Write your answers in the spaces provided.

You must write down all stages in your working.

1. The composite bar charts show information about the metals used to make brass, bronze and pewter.



(Data source: [www.gizmology.net](http://www.gizmology.net))

Three of the following statements are true.

Tick (✓) the **true** statements.

Bronze is made from three different metals	<input type="checkbox"/>
In pewter there is a large proportion of tin	<input type="checkbox"/>
50% of brass is zinc	<input type="checkbox"/>
There is copper in brass, bronze and pewter	<input type="checkbox"/>
In bronze there is more tin than copper	<input type="checkbox"/>

(Total 3 marks)

Q1



2. The pictogram shows information about the times taken by ferries to cross the Irish Sea by different routes.

Fishguard – Rosslare	⊕	⊕	⊕	⊕				
Holyhead – Dublin	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Stranraer – Belfast	⊕	⊕	⊕					
Fleetwood – Larne	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕

Key: ⊕ represents 1 hour  
(Data source: Stena Line Ferries)

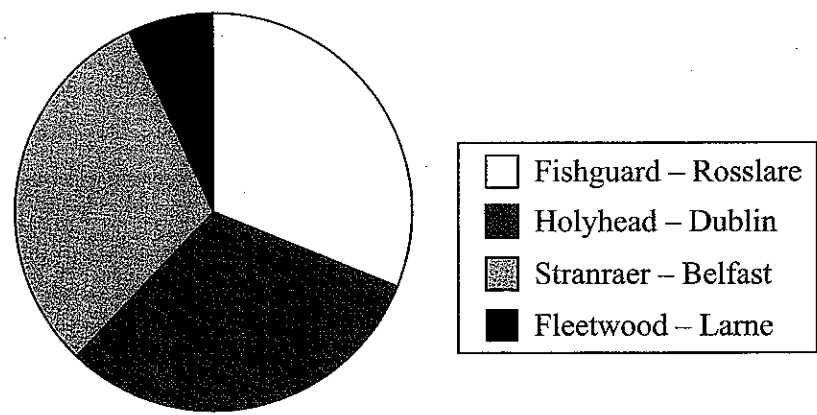
(a) Write down the route that takes the shortest time.

..... (1)

(b) Write down how long it takes to go from Fishguard to Rosslare.

..... hours (1)

The pie chart shows the proportions of passengers taking each of these routes in a year.



(c) Discuss why the route with the smallest proportion of passengers is not popular.

.....  
.....  
.....  
.....  
.....

(2)

(Total 4 marks)

Q2  
[ ]



3. A farmer has two farms.

On one farm he has battery hens, on the other farm he has the same number of free-range hens.

One Saturday the sizes of the eggs collected from the two farms were as follows:

	Large	Medium	Small	Total number of eggs
Free-range hens	125	210	105	
Battery hens	75	210	125	
<b>Totals</b>				

(a) Complete the two-way table.

(2)

An egg from those collected on the Saturday is chosen at random.

(b) Write down the probability that the egg chosen is

(i) large,

.....

(ii) from a free-range hen and medium.

.....

(2)

(c) Compare and contrast the numbers of the different sizes of eggs laid by the free-range hens and the battery hens on these farms.

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Q3

(2)  
(Total 6 marks)



4. The table shows the numbers of casualties from road accidents, in thousands, involving illegal alcohol levels in Northern Ireland in the years 1986 to 2000.

	<b>Fatal injuries</b>	<b>Serious injuries</b>	<b>Slight injuries</b>	<b>Total casualties</b>
<b>1986</b>	1.03	6.57	19.60	27.20
<b>1987</b>	0.93	6.01	17.99	24.93
<b>1988</b>	0.81	5.18	17.25	23.24
<b>1989</b>	0.84	4.92	17.05	22.81
<b>1990</b>	0.80	4.23	16.01	21.04
<b>1991</b>	0.69	3.72	14.00	18.41
<b>1992</b>	0.69	3.40	13.28	17.37
<b>1993</b>	0.57	2.82	12.25	15.63
<b>1994</b>	0.54	2.95	12.26	15.75
<b>1995</b>	0.56	3.10	12.89	16.56
<b>1996</b>	0.60	3.13	13.93	17.67
<b>1997</b>	0.57	3.07	13.90	17.55
<b>1998</b>	0.49	2.68	13.25	16.42
<b>1999</b>	0.48	2.60	14.64	17.72
<b>2000</b>	0.56	2.71	15.75	19.02

(Data source: *Department for Transport, Royal Ulster Constabulary*)

(a) Write down the **Total casualties** in 1989.

..... thousand  
(1)

The total number of casualties in 1996, found by adding together the **Fatal**, **Serious** and **Slight injuries** columns comes to 17.66 thousand.

The number of casualties in the **Total casualties** column is 17.67 thousand.

(b) Give a reason for this difference.

.....  
 .....  
 ..... (1)



(c) Describe the trend in the total numbers of **Fatal injuries** in the years

(i) 1986 to 1991,

.....

.....

.....

.....

.....

(ii) 1993 to 2000.

.....

.....

.....

.....

.....

(2)

Q4

(Total 4 marks)



5. A bird reserve is divided into 16 regions of equal size.

The number of swans' nests in each region is counted.

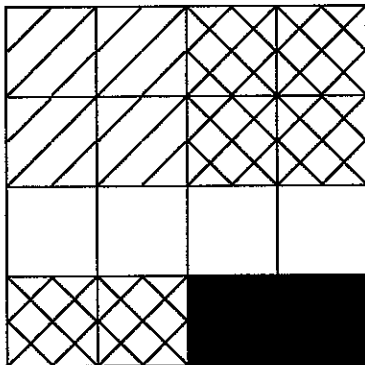
The results are shown in the following diagram.

0	0	3	3
1	2	4	3
2	1	4	6
3	5	7	8

5
---

 means 5 swans' nests in this region.

- (a) Use the information in the diagram to complete this choropleth map. 12 regions have already been shaded.



Number of swans' nests	
	0 - 2
	3 - 5
	6 - 8

(1)

- (b) Describe how the swans' nests are spread across the bird reserve.

.....  
 .....

(1)

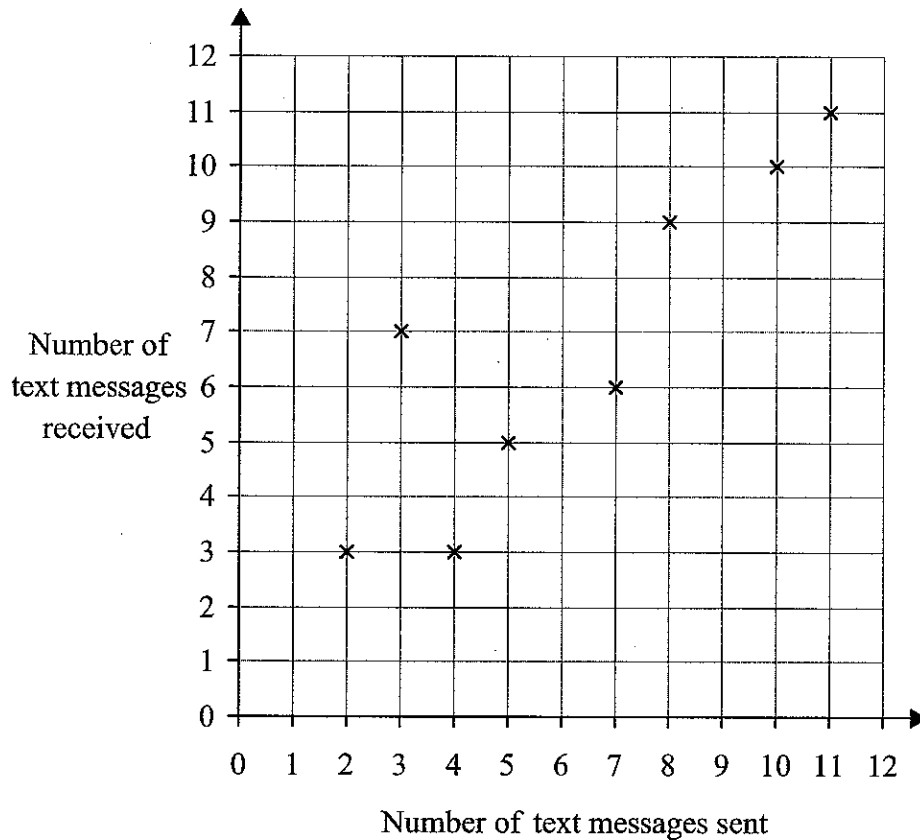
Q5

(Total 2 marks)





6. Whitney records the number of text messages she sent and the number of text messages she received on each of eight Saturdays. The scatter diagram shows her results.



- (a) Write down the number of text messages she received on the day she sent 4 text messages.

.....  
(1)

- (b) Work out the total number of text messages she sent on all eight Saturdays.

.....  
(1)

- (c) Describe the correlation between the number of text messages sent and the number of text messages received.

.....  
(1)

- (d) On the scatter diagram, draw a line of best fit.

(1)

On the ninth Saturday Whitney sent 6 text messages.

- (e) Estimate the number of text messages she received on this Saturday.

.....  
(1)

(Total 5 marks)

Q6



7. Lincoln greenhouses grow Shirley tomatoes. A sample of 26 tomatoes was taken. The weights, to the nearest 5 grams, of the 26 tomatoes were:

60 60 55 65 60 50 60 65 50 65 70 50 65  
 65 50 55 55 70 65 60 65 70 50 55 65 60

- (a) Complete the frequency table.

Weight ( $x$ )	Frequency ( $f$ )	$fx$
50	5	250
55	4	220
60	6	360
65		
70		
<b>Totals</b>		

(1)

- (b) Use the information in the table to work out an estimate of the mean weight of these tomatoes.

..... g  
 (2)



Supermarkets want each tomato they sell to be about the same weight.

- (c) What other statistical information might the supermarkets need before deciding whether or not Shirley tomatoes will meet their requirements?

.....

.....

.....

.....

.....

.....

(1)

Q7

(Total 4 marks)

**TOTAL FOR SECTION A: 28 MARKS**



### SECTION B

Answer ALL the questions. Write your answers in the spaces provided.

You must write down all stages in your working.

1. A market research company wants to find out the views of customers about a new supermarket that has just opened.

(a) Give **two** reasons why the company should take a sample rather than a census.

(i) .....  
.....  
.....

(ii) .....  
.....  
.....

(2)

The market research company uses a questionnaire.

(b) Write down an example of a closed question that could be used on a questionnaire.

.....  
.....  
.....

(2)

(c) Give **two** reasons why a pilot survey (pre-test) should be carried out.

(i) .....  
.....  
.....

(ii) .....  
.....  
.....

(2)



One question on the questionnaire is

“Do you agree that the goods are well laid-out and easy to find?”

(d) Discuss whether this is a suitably worded question for the questionnaire.

.....

.....

.....

.....

.....

(2)

(Total 8 marks)

Q1

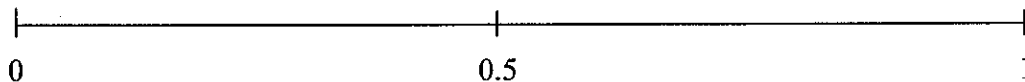


2. Joan makes a list of all the babies born at St Peter's Hospital last week. Joan selects, at random, a baby from the list.

Events  $A$ ,  $B$  and  $C$  are

$A$	The baby is male
$B$	The baby was born on Tuesday
$C$	The baby is male or female

- (a) Label the events  $A$ ,  $B$  and  $C$  on the probability scale below.



(2)

The table shows some information about the probabilities of getting different numbers of births on a Sunday at Linchfield Hospital.

Number of births	Probability
fewer than 3	
3	0.5
4	0.25
more than 4	0.15

- (b) Complete the table.

(2)



(c) Using the information in the table, work out the probability that there will be 4 or more births on a Sunday at Linchfield Hospital.

.....  
(1)

(d) Write down the most likely number of births on a Sunday at Linchfield Hospital.

.....  
(1)

(e) Work out the probability of getting exactly 3 births on one Sunday, followed by exactly 3 births on the next Sunday at Linchfield Hospital.

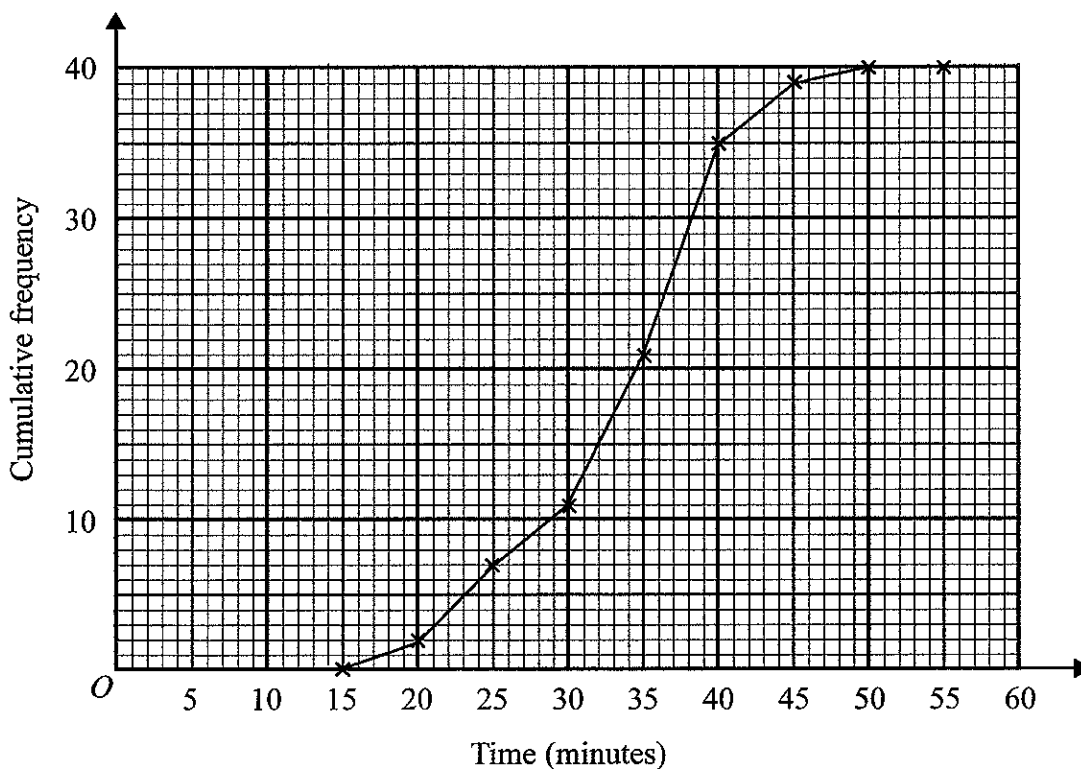
.....  
(2)

(Total 8 marks)

Q2



3. Some female students were asked to read an essay. The time taken, to the nearest minute, for each student to read the essay was recorded. The information is summarised in the cumulative frequency diagram.



(a) Using the cumulative frequency diagram,

(i) write down the number of students in the group,

.....

(ii) find the median time to read the essay,

..... minutes

(iii) work out the number of students who took less than 38 minutes to read the essay.

.....

(3)





39 male students were asked to read the same essay.

The time taken, to the nearest minute, for each of 30 of the male students are shown in the stem and leaf diagram.

Time	
2	5 6 7 8 8 9
3	2 2 2 3 4 4 4 4 5 6 7 7 7 9
4	0 0 1 1 1 2 2 3
5	0 1

Key: 2 | 5 = 25 minutes

The times for the other male students are given below.

43 51 43 45 52 48 53 55 48

(b) Complete the stem and leaf diagram for the 39 male students. (2)

(c) Using your stem and leaf diagram,

(i) find the median time for the male students to read the essay,

..... minutes

(ii) write down the number of male students who took less than 38 minutes to read the essay.

.....  
(2)

(d) Compare the times for the male and female students to read the essay.

.....

.....

.....

.....

.....

(2)

(Total 9 marks)

Q3



4. A gardener wants to know how many ladybirds there are on the plants in his greenhouse.

There are 3000 plants in the greenhouse.

The plants are arranged in 100 rows of 30.

He takes a random sample of 30 plants.

(a) Write down a sampling frame he could use.

..... (1)

(b) Describe how he can take a random sample.

.....  
 .....  
 .....  
 ..... (2)

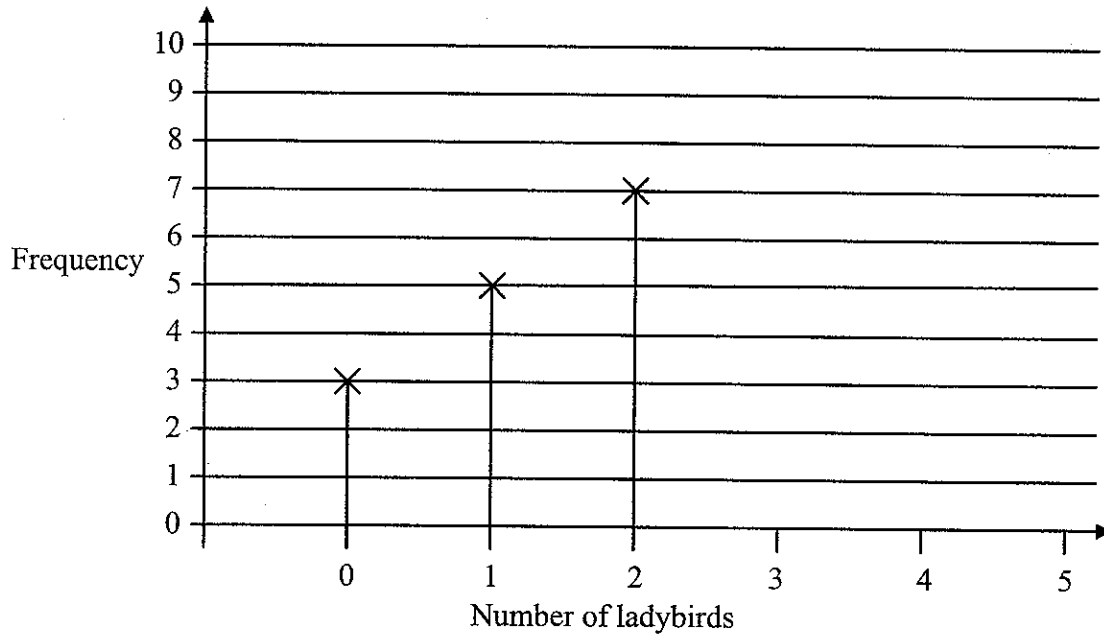
The gardener records the number of ladybirds on each of the 30 plants.

His results are summarised in the frequency table.

Number of ladybirds	Frequency
0	3
1	5
2	7
3	10
4	4
5	1
Total	30



(c) Using the information in the table, complete the vertical line graph below.



(2)

(d) Write down the modal number of ladybirds.

.....  
(1)

(e) Work out the number of ladybirds in the sample.

.....  
(2)

There are 30 plants in the sample and 3000 plants in the greenhouse.

(f) Work out an estimate for the total number of ladybirds on the plants in the greenhouse.

.....  
(1)

(Total 9 marks)

Q4



5. A gift shop sells wrapping paper.

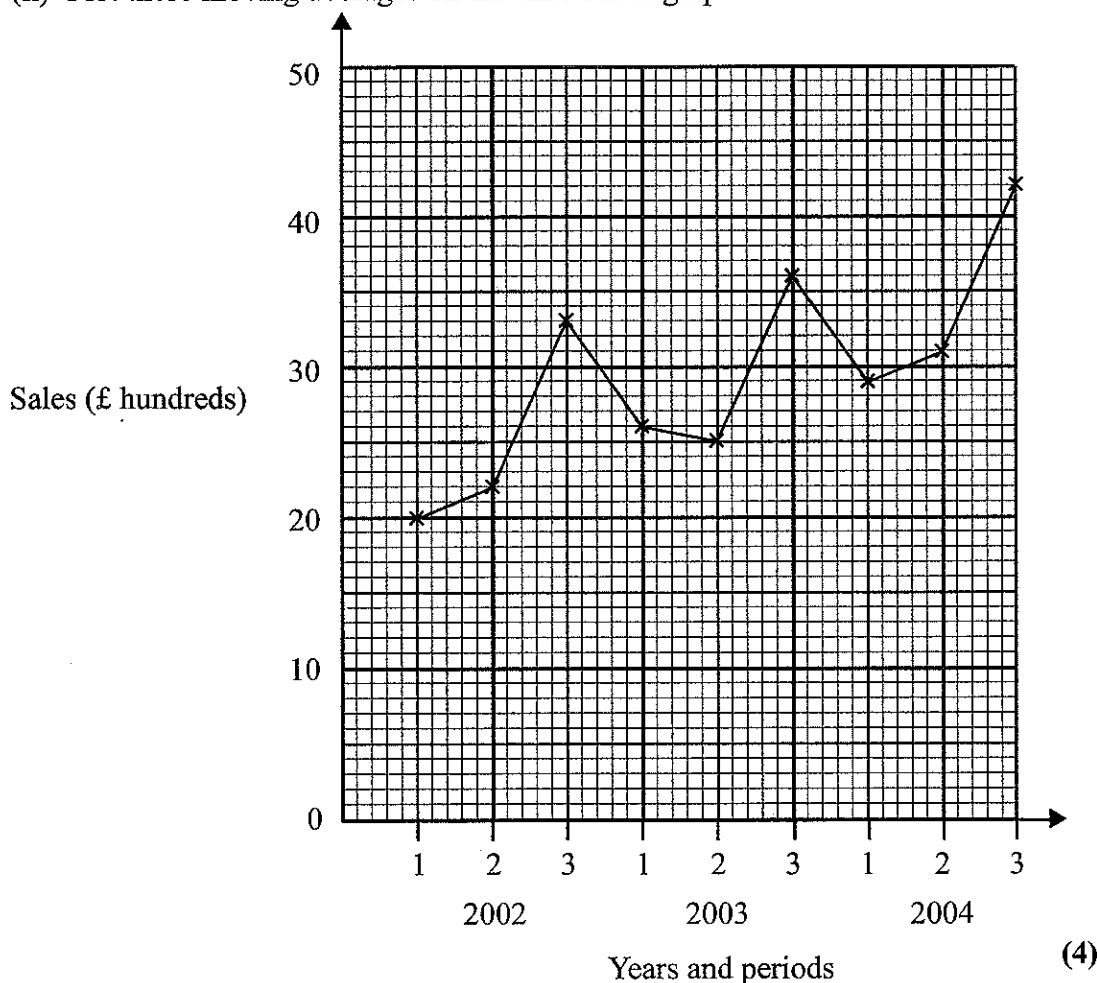
The table gives information about the sales of wrapping paper, in £s, for successive four-month periods from the start of 2002 to the end of 2004.

The first 4 three-point moving averages have been worked out.

Year	Period		Sales (£ hundreds)	Three-point moving average
2002	Jan – Apr	1	20	
	May – Aug	2	22	$(20 + 22 + 33) \div 3 = 25$
	Sep – Dec	3	33	$(22 + 33 + 26) \div 3 = 27$
2003	Jan – Apr	1	26	$(33 + 26 + 25) \div 3 = 28$
	May – Aug	2	25	$(26 + 25 + 36) \div 3 = 29$
	Sep – Dec	3	36	
2004	Jan – Apr	1	29	
	May – Aug	2	31	
	Sep – Dec	3	42	

(a) (i) Complete the table to show the other three-point moving averages.

(ii) Plot these moving averages on the time series graph.



(b) What do the moving averages show about the trend of the sales of wrapping paper in the gift shop?

.....  
 .....

(1)

The time series graph shows there are seasonal variations in the sales of wrapping paper in the gift shop.

(c) (i) In which period are there more sales than the general trend?

.....

(ii) Suggest a reason for this.

.....  
 .....

(2)

The following table shows the total sales of wrapping paper, in £s, in the gift shop in 2002 and 2003.

<b>Year</b>	2002	2003
<b>Sales (£)</b>	75	87

(d) Taking 2002 as the base year, work out the index number for the sales in 2003.

.....

(2)

The sales of wrapping paper decreased in the gift shop by 5% between 2004 and 2005.

(e) Taking 2004 as the base year, complete the table to show the index numbers for the sales in 2004 and 2005.

<b>Year</b>	2004	2005
<b>Index number</b>		

(2)

(Total 11 marks)

Q5



6. In a traffic survey the police record the speeds, in miles per hour (mph), of 400 cars on a particular motorway in Britain.

The results were used to work out the information in the table.

	Speed (mph)
Minimum	45
Lower quartile	55
Median	67
Upper quartile	70
Maximum	95

- (a) From this information, work out

(i) the range,

.....

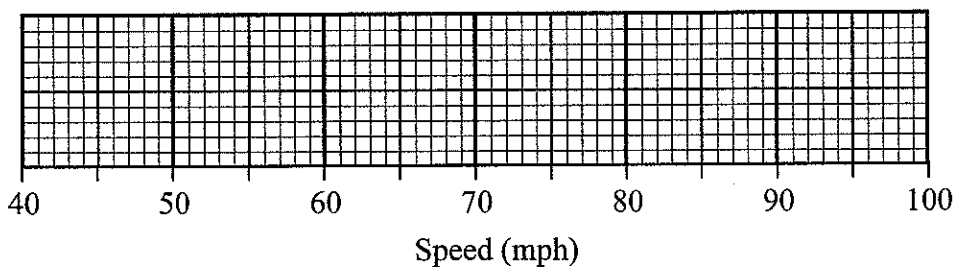
(ii) the inter-quartile range.

..... (2)

- (b) Write down **one** disadvantage of using the range as a measure of spread.

.....  
 ..... (1)

- (c) On the grid, draw a box plot to represent the information in the table.



(2)





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