

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

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General Certificate of Secondary Education
June 2005



STATISTICS
Foundation Tier

3311/F

F

Friday 24 June 2005 9.00 am to 11.00 am

<p>In addition to this paper you will require:</p> <ul style="list-style-type: none"> • a calculator • mathematical instruments. 	
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For Examiner's Use	
Pages	Mark
3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
14 – 15	
16 – 17	
18 – 19	
TOTAL	
Examiner's Initials	

Time allowed: 2 hours

Instructions

- Use blue or black ink or ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- Do all rough work in this booklet.

Information

- The maximum mark for this paper is 100.
- Mark allocations are shown in brackets.
- Additional answer paper and graph paper will be issued on request and must be tagged securely to this answer booklet.
- You are expected to use a calculator where appropriate.

Advice

- In all calculations, show clearly how you work out your answer.

You may need to use the following formulae:

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

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

where x is the mid-interval value.

Answer **all** questions in the spaces provided.

- 1 Fifty pupils were asked about the type of accommodation they stayed in on holiday last year.
Some of the results are shown in the table.

	Hotel	Caravan	Tent	Total
Boys	12	9		24
Girls			14	26
Total	20		17	50

- (a) How many girls stayed in a hotel?

.....

Answer (2 marks)

- (b) Complete the table.

.....

(2 marks)

TURN OVER FOR THE NEXT QUESTION

- 2 Stephen works in a newsagent's on a Saturday morning. He records the number of items bought by each customer. The results for last Saturday were as follows.

Number of items bought by each customer	Tally	Frequency
1		
2		
3		
4		
5		
6		

- (a) Complete the frequency column. (2 marks)
- (b) How many customers were there?

Answer (2 marks)

- (c) What was the total number of items bought?

.....

.....

.....

Answer (3 marks)

- (d) Calculate the mean number of items bought by each customer.

.....

.....

.....

Answer (2 marks)

- (e) What was the modal number of items bought by each customer?

Answer (1 mark)

3 As part of her Statistics coursework Sarah draws the following three scatter diagrams.

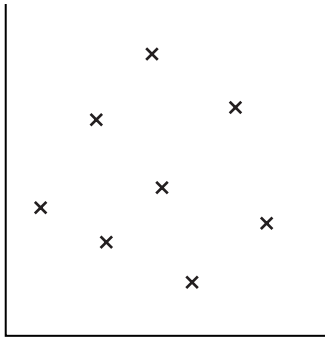


Diagram 1

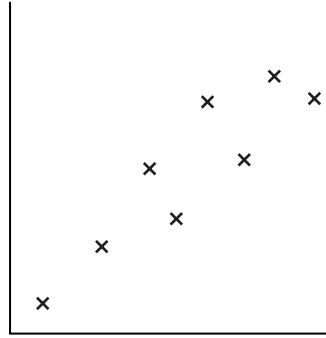


Diagram 2

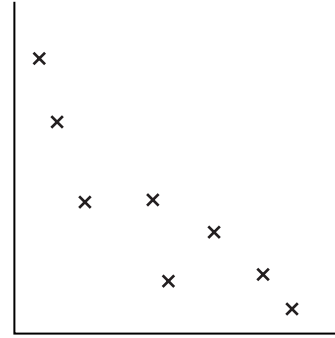


Diagram 3

(a) Which diagram shows

(i) positive correlation

Answer (1 mark)

(ii) no correlation?

Answer (1 mark)

(b) One axis for Diagram 3 is labelled 'Age of car'.



Age of car






Choose a suitable label for the other axis from the following list.

- Engine size Value of car Miles travelled Price of petrol

Answer (1 mark)

- 4 A store sells football shirts in five colours: red, blue, green, yellow and white.

The pictogram shows the number of shirts of each colour sold last month.

Red	
Blue	
Green	
Yellow	
White	



represents 10 shirts

- (a) Which colour of shirt is least popular?

Answer (1 mark)

- (b) How many shirts in total were sold last month?

.....
.....

Answer (2 marks)

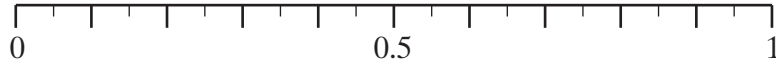
- (c) How many more red shirts were sold than white shirts?

.....
.....

Answer (2 marks)

(d) Using the information in the pictogram, mark on the line below

- (i) with a letter 'G' an estimate of the probability that the next shirt sold will be green
- (ii) with a letter 'B' an estimate of the probability that the next shirt sold will be blue.



(2 marks)

(e) Use the information in the pictogram to find an estimate of the probability that the next shirt sold will be

- (i) either white or yellow

.....

.....

Answer (2 marks)

- (ii) black

.....

.....

Answer (1 mark)

- (iii) not red.

.....

.....

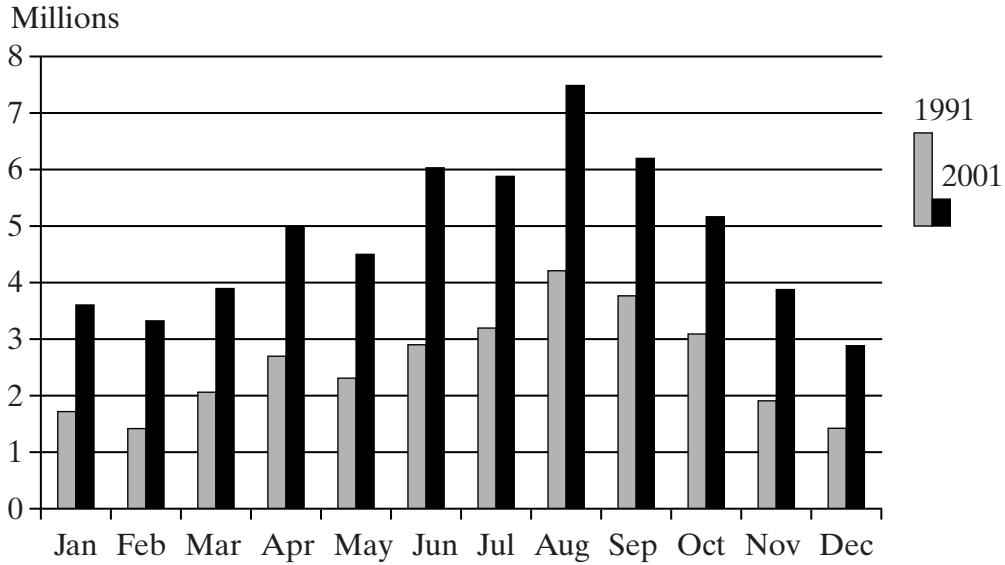
Answer (2 marks)

TURN OVER FOR THE NEXT QUESTION

Turn over ►

5 The diagram shows the number of UK residents travelling abroad during 1991 and 2001.

UK residents travelling abroad during 1991 and 2001



Source: Adapted from *International Passenger Survey, Office for National Statistics, Social Trends*

(a) Describe **two** features of the diagram.

Feature 1

.....

Feature 2

.....

(2 marks)

(b) In May 1991, 2.2 million UK residents travelled abroad.

Estimate from the diagram the number who travelled abroad in May 2001.

Answer million (1 mark)

(c) In April 1991, 2.7 million UK residents travelled abroad.

Find the percentage increase in the number of UK residents who travelled abroad in April 2001 compared to April 1991.

.....

.....

.....

Answer % (4 marks)

- (d) A national newspaper reported that in the **first week** of June 2001 there were 600 000 UK residents travelling abroad.

Explain why this report may be wrong.

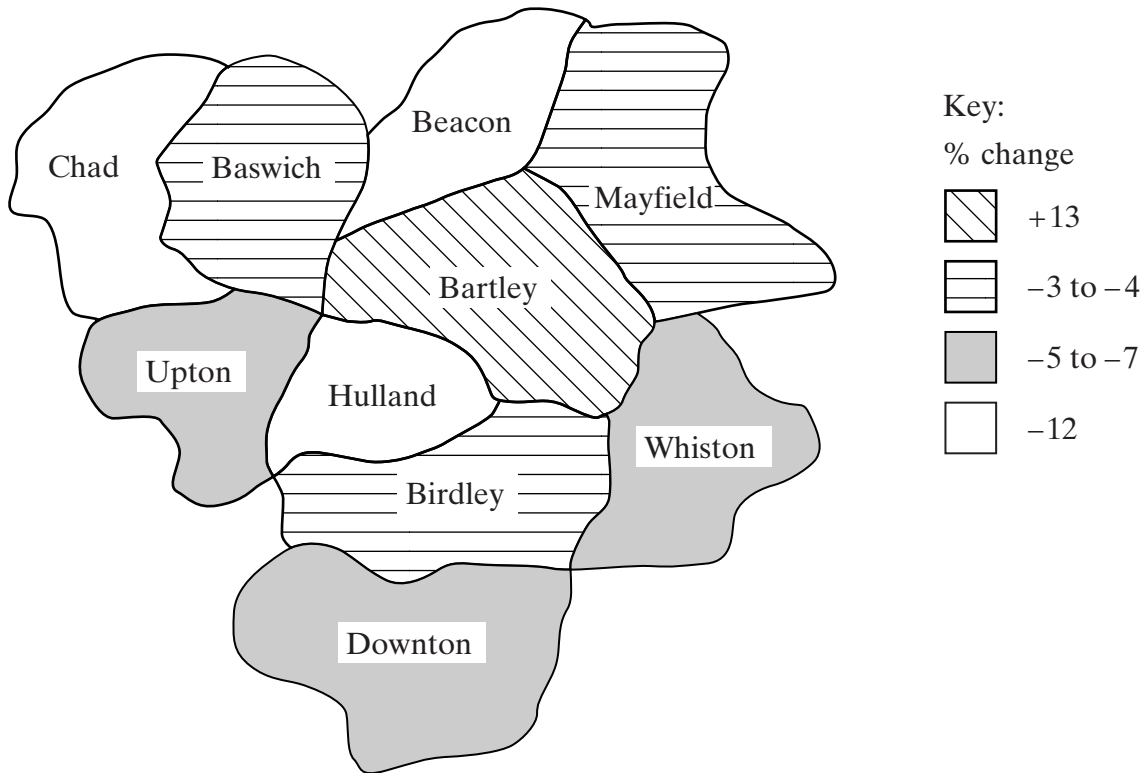
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(2 marks)

- 6 The choropleth map (shading map) shows population changes in ten districts of a large city between 1991 and 2001.



- (a) In which district has there been the largest population change?

Answer (1 mark)

- (b) How many districts show a decrease in population of 5% or more?

.....

Answer (1 mark)

Turn over ►

- 7 As part of a school project, Paul carried out 2 surveys of the ages of passengers using his local train service.

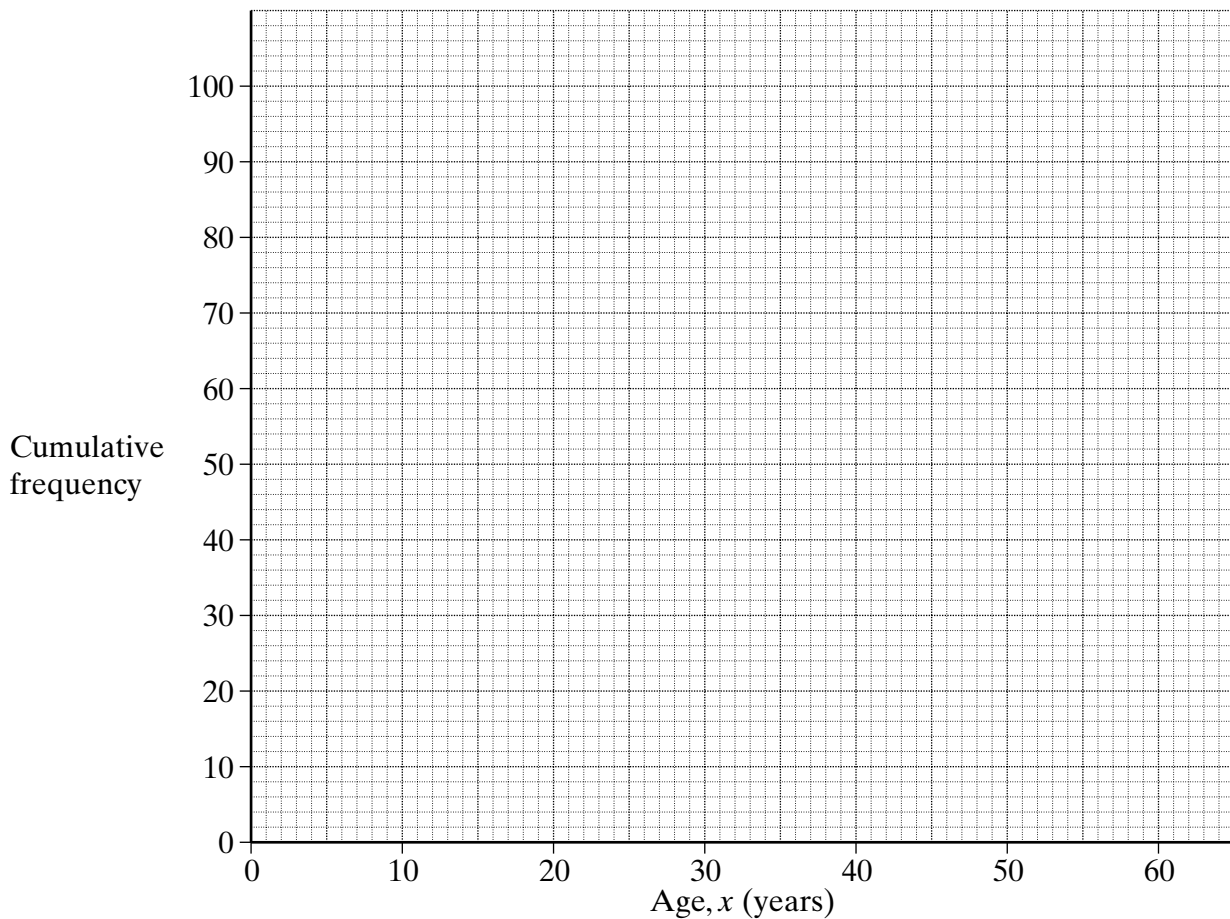
The surveys were undertaken at 10 am and 5 pm on a Tuesday.

There were 100 passengers in each survey.

The results for the 10 am survey were as follows.

Age, x (years)	Frequency	Cumulative Frequency
$0 \leq x < 10$	14	14
$10 \leq x < 20$	41	
$20 \leq x < 30$	13	
$30 \leq x < 40$	19	
$40 \leq x < 50$	9	
$50 \leq x < 60$	4	

- (a) Complete the cumulative frequency column. (2 marks)
- (b) Draw a cumulative frequency polygon on the grid below.



(3 marks)

(c) Use your diagram to estimate

(i) the median

Answer years (1 mark)

(ii) the lower quartile

Answer years (1 mark)

(iii) the upper quartile.

Answer years (1 mark)

(d) The youngest passenger was 3 years old.
The oldest passenger was 57 years old.

Find the range.

Answer years (1 mark)

(e) Paul drew a box and whisker plot for the 5 pm survey.



(i) Draw a box and whisker plot for the 10 am survey. (4 marks)

(ii) Write down **two** differences between the ages of passengers in the two surveys.

Difference 1

.....

Difference 2

.....

(2 marks)

Turn over ►

8 A travel agent records in the table below some information about the holiday destinations of a sample of 180 UK families.

Holiday destination	Frequency	Angle on pie chart
Greece		90°
France	72	
Spain	54	
Others		18°
Total	180	

(a) How many families in the sample went to Greece?

.....

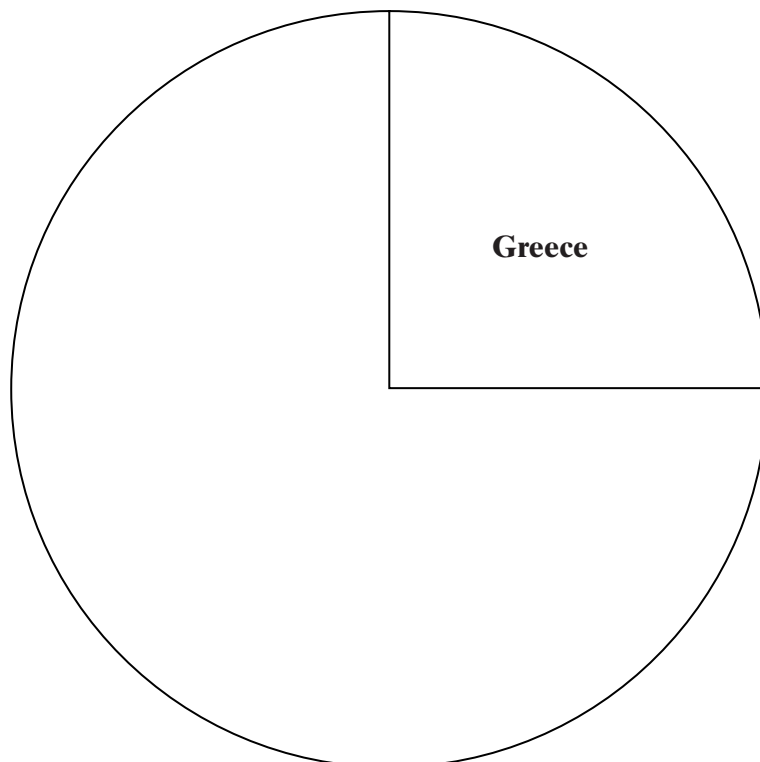
Answer (2 marks)

(b) Complete the table.

.....

(2 marks)

(c) Complete the pie chart.



(2 marks)

- (d) The travel agent decides to survey all existing customers using a postal questionnaire. One question is shown below.

‘How much do you spend each year on holidays abroad?’

Please tick one box.

£1000 - £1500	<input type="checkbox"/>
£1500 - £2000	<input type="checkbox"/>
£2000 - £3500	<input type="checkbox"/>
£3500 - £6000	<input type="checkbox"/>
£6000 and over	<input type="checkbox"/>

Give **two** distinct criticisms of the response section of this question.

Criticism 1

.....

Criticism 2

.....

(2 marks)

- (e) Of 2000 questionnaires posted out, only 93 were returned.

Give **two** ways in which the response rate could be increased.

1

.....

2

.....

(2 marks)

- 10** A youth club has 72 members.
The leader decides to select six members at random to go on a sailing course.
He numbers the members 01 to 72 and uses the random number table below to make his selection.

29	44	76	56
44	51	38	00
07	21	92	17

- (a) Starting with 29 and reading across each row, write down the number of each of the six members that he selects.

Answer (3 marks)

- (b) The youth club has 48 boys and 24 girls as members.

Calculate the number of boys and girls the leader should include in a stratified sample of six members.

.....
.....

Boys

Girls

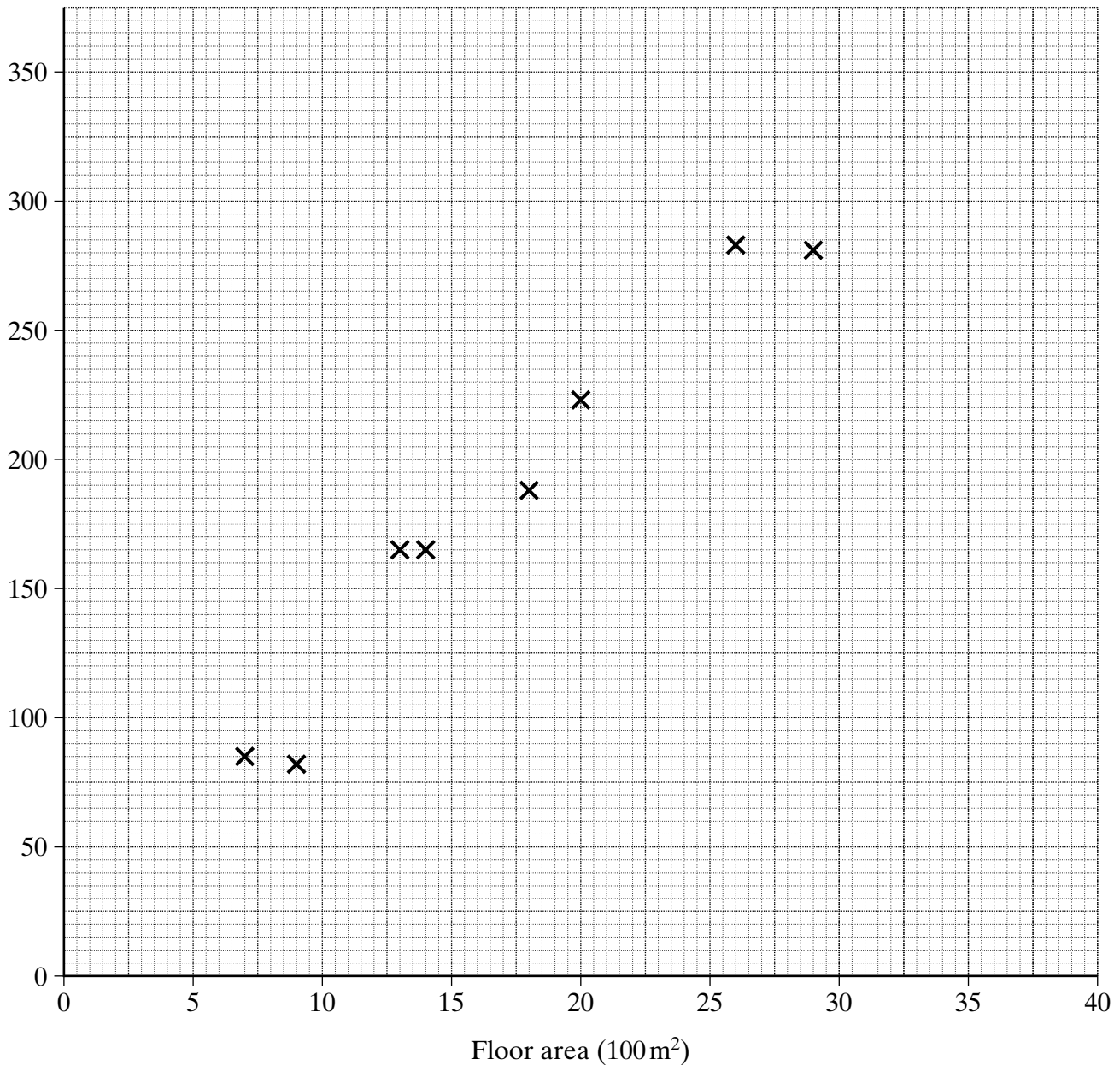
(3 marks)

11 The scatter diagram shows the floor area (100 m^2) and the daily takings (£1000) for a chain of supermarkets.

- (a) The mean floor area is 1700 m^2
The mean daily takings are £184 000

Draw a line of best fit on the scatter diagram.

Daily takings (£1000)



(2 marks)

(b) It is proposed to build two new supermarkets.

Use your line of best fit to estimate the daily takings for a supermarket with floor area

(i) 2200 m²

Answer £ (1 mark)

(ii) 3500 m²

Answer £ (1 mark)

(c) Which of these estimates is more reliable?

Give a reason for your answer.

.....

.....

(1 mark)

TURN OVER FOR THE NEXT QUESTION

- 12** Louise collects CDs.
She keeps records of her CDs.
The records she keeps are

the cost
the length of time each track lasts
the number of tracks on each CD.

Give an example of

- (a) a discrete variable that Louise records

Answer (1 mark)

- (b) a continuous variable that Louise records.

Answer (1 mark)

- 13** A bag contains
- | | |
|---|-----------|
| 7 | 1p coins |
| 6 | 2p coins |
| 4 | 5p coins |
| 3 | 10p coins |

- (a) One coin is selected at random.

What is the probability that it is worth more than 4 pence?

Answer (1 mark)

- (b) The coin is replaced.
A second coin is selected at random.
It is worth more than 4 pence.

What is the probability that it is a 10p coin?

Answer (2 marks)

14 The table shows the cost indices for renting a shop, using 1997 as the base year.

Year	1997	1998	1999	2000	2001	2002
Cost Index	100	115	96	118	110	113

(a) In which years did the rent fall?

Answer (2 marks)

(b) The annual rent was £6900 in 1998.

(i) Calculate the annual rent in 1997.

.....

.....

.....

Answer £ (2 marks)

(ii) Calculate the annual rent in 2002.

.....

.....

.....

Answer £ (2 marks)

(c) In which year was the annual rent the highest?

Answer (1 mark)

(d) Calculate the percentage increase in the annual rent between 2001 and 2002.

.....

.....

.....

Answer % (3 marks)

END OF QUESTIONS

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE