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General Certificate of Secondary Education
June 2003

STATISTICS　　　　　　　　　　　　　　　**3311/F**
Foundation Tier

AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

F

Friday 20 June 2003　9.00 am to 11.00 am

In addition to this paper you will require:
• 　a calculator
• 　mathematical instruments.

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:

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.

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

1 The pictogram shows the number of loaves of sliced bread sold during one week at a baker's shop.
The section on thin sliced loaves has been left blank.

Thick sliced loaves

Medium sliced loaves
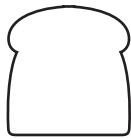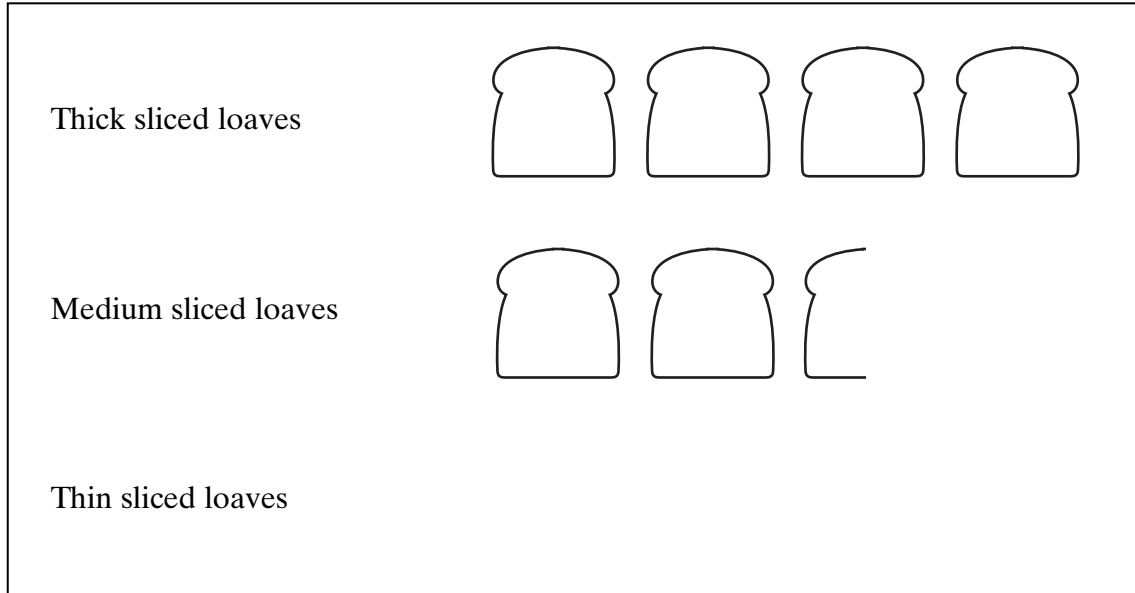
Thin sliced loaves

 represents 20 loaves

(a) How many thick sliced loaves were sold?

Answer .... *(1 mark)*

(b) How many medium sliced loaves were sold?

Answer .... *(1 mark)*

(c) The baker sold 60 thin sliced loaves.
Complete the pictogram.

(1 mark)

(d) Work out the total number of loaves sold.

....

....

Answer .... *(2 marks)*

Turn over ▶

2 Membership of Midton Golf Club is open to all women in the town.

Of the members aged 40 and over, 58 are single and 30 are divorced.
Altogether 52 of the women are married.

(a) Put these values into the table below:

Age	Single	Married	Divorced	Total
Under 40		25	12	45
40 and over				
Total				160

(3 marks)

(b) Complete the remaining parts of the table.

....

....

....

(4 marks)

3 Peter receives a questionnaire in the post about a new local radio station.

Three of the questions are shown below.

Give **one** criticism of each question.

Question 1

How many hours have you listened to the radio during the past six months?

Criticism:

....

....

....

Question 2

How much do you earn each year?   Please tick one box.

Less than £10 000   £10 000 up to £20 000   More than £20 000

Criticism:

....

....

....

Question 3

If you have already heard our new radio station, give one reason why you enjoyed listening to it.

Criticism:

....

....

....

(3 marks)

Turn over ▶

10
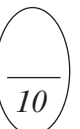
4 The following table shows the production in 1995 and 2001 at the Royal Wedgetown Pottery Company.

Production (millions of items)

Product	1995	2001
Cups	15.0	12.0
Mugs	18.5	20.0
Plates	24.0	26.5
Bowls	27.5	29.5

The composite bar chart for production in 1995 is shown on the graph opposite.

(a) On the same graph draw the composite bar chart for 2001.

....

....

....

....

(3 marks)

(b) Describe **two** main changes to the production figures between 1995 and 2001.

1 ....

....

2 ....

....

(2 marks)

(c) In 1995 the price of one of the hand painted plates produced by the Company was £7.50   By 2001 its price had risen to £10.20

Calculate the index number for 2001, using 1995 as the base year.

....

....

....

Answer ....   *(3 marks)*

Composite Bar Charts: Production of Royal Wedgetown Pottery

Production (millions)

90

80

Bowls

70

60

Plates

50

40

Mugs

30

20

Cups

10

0

1995   2001

Year

Turn over ▶

8
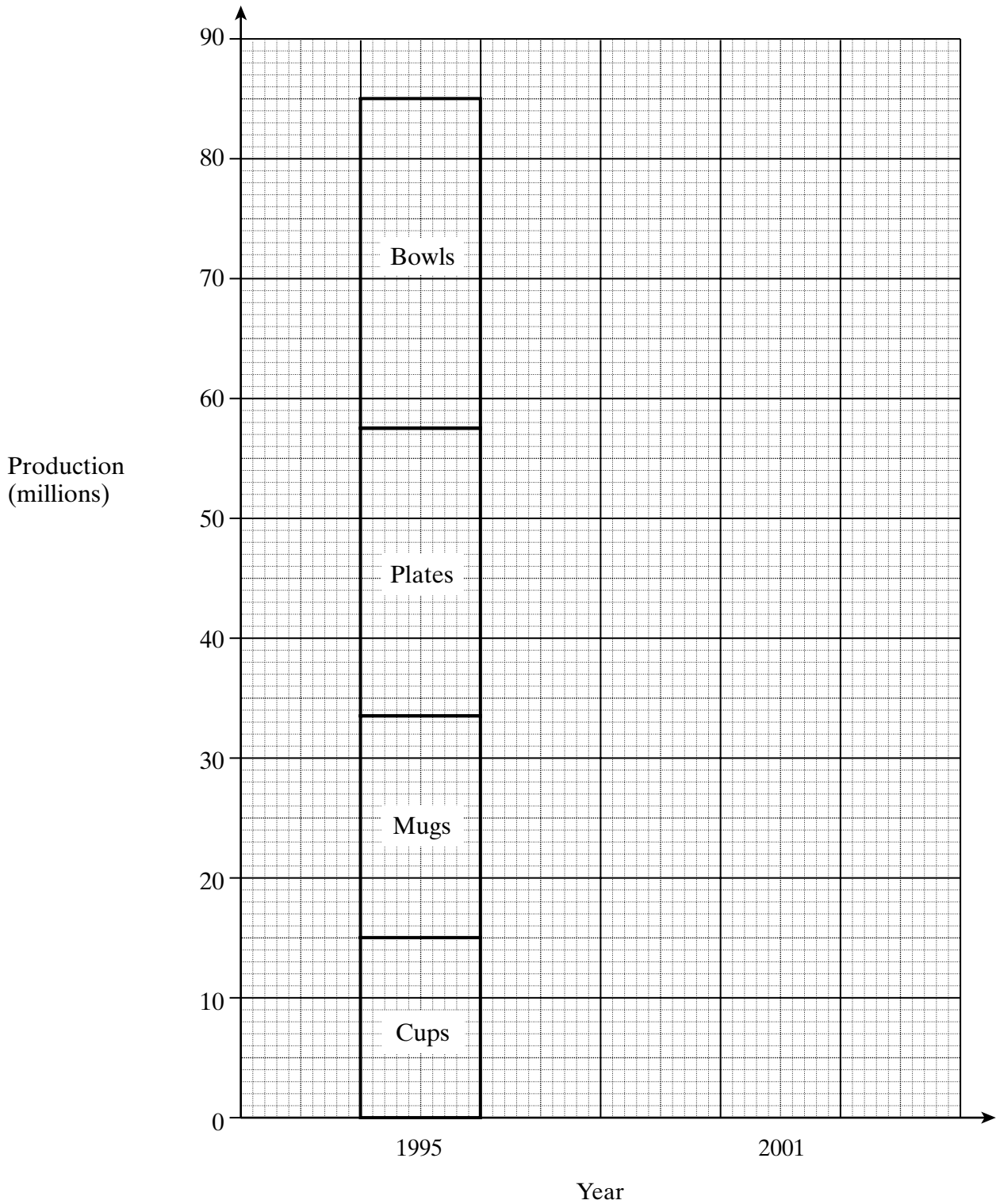
5 On the 1st of January 2002 the population of Longtown was 12 027.

The population of a neighbouring town, Greenfield, was 11 860.

The following table gives the numbers of births and deaths for each town during 2002.

	Longtown	**Greenfield**
Births	129	214
Deaths	241	95

(a) Show that the crude birth rate for Longtown is 10.7

....

....

(2 marks)

(b) Calculate the crude death rate for Longtown.

....

....

....

Answer .... *(2 marks)*

(c) The crude birth rate for Greenfield for 2002 is 18.0

The crude death rate for Greenfield for 2002 is 8.0

Which of the two towns has an increasing population?
Give a reason for your answer.

....

....

....

....

(2 marks)

6 In each of the following, write down whether you would expect a positive correlation, a negative correlation, or no correlation between the two variables.

(a) The amount of ice cream sold daily in the United Kingdom and the daily temperature in the United Kingdom

Answer .... *(1 mark)*

(b) The number of hours of daylight and the number of units of electricity used for lighting in a house

Answer .... *(1 mark)*

TURN OVER FOR THE NEXT QUESTION

8

7 The diagram and table below show information about the number of people visiting historic sites in England.

The graph and table, adapted from 'Social Trends' (2002), are not reproduced here due to third-party copyright constraints.

The full copy of this paper can be obtained by ordering 3311/F from AQA Publications
Tel: 0161 953 1170

(a) Estimate the total number of visitors in the third quarter, Q3, of 2000.

....

....

Answer .... million   *(2 marks)*

(b) In which quarter of which year was there the smallest difference between the number of male and female visitors?

....

Answer ....   *(1 mark)*

(c)   (i)   Which site showed the largest increase in the number of visitors between 1998 and 1999?

....

Answer ....   *(2 marks)*

(ii)   What was the percentage increase in the number of visitors between 1998 and 1999 at this site?

....

....

....

Answer .... %   *(3 marks)*

(iii)   Suggest a possible reason for some of the sites having an increase in the number of visitors between 1998 and 1999.

....

....

(1 mark)

(d)   Staff at Tower Bridge wish to undertake a survey to find out how long visitors spend at the site.

They decide to use face to face interviews to collect this information.

Give **one** advantage and **one** disadvantage in using this method of data collection.

Advantage:

....

....

....

Disadvantage:

....

....

....

(2 marks)

Turn over ▶

8 Ten pupils, **A** to **J**, were given a test in Mathematics and a test in Physics. The marks obtained in each test have been plotted on the scatter diagram below.
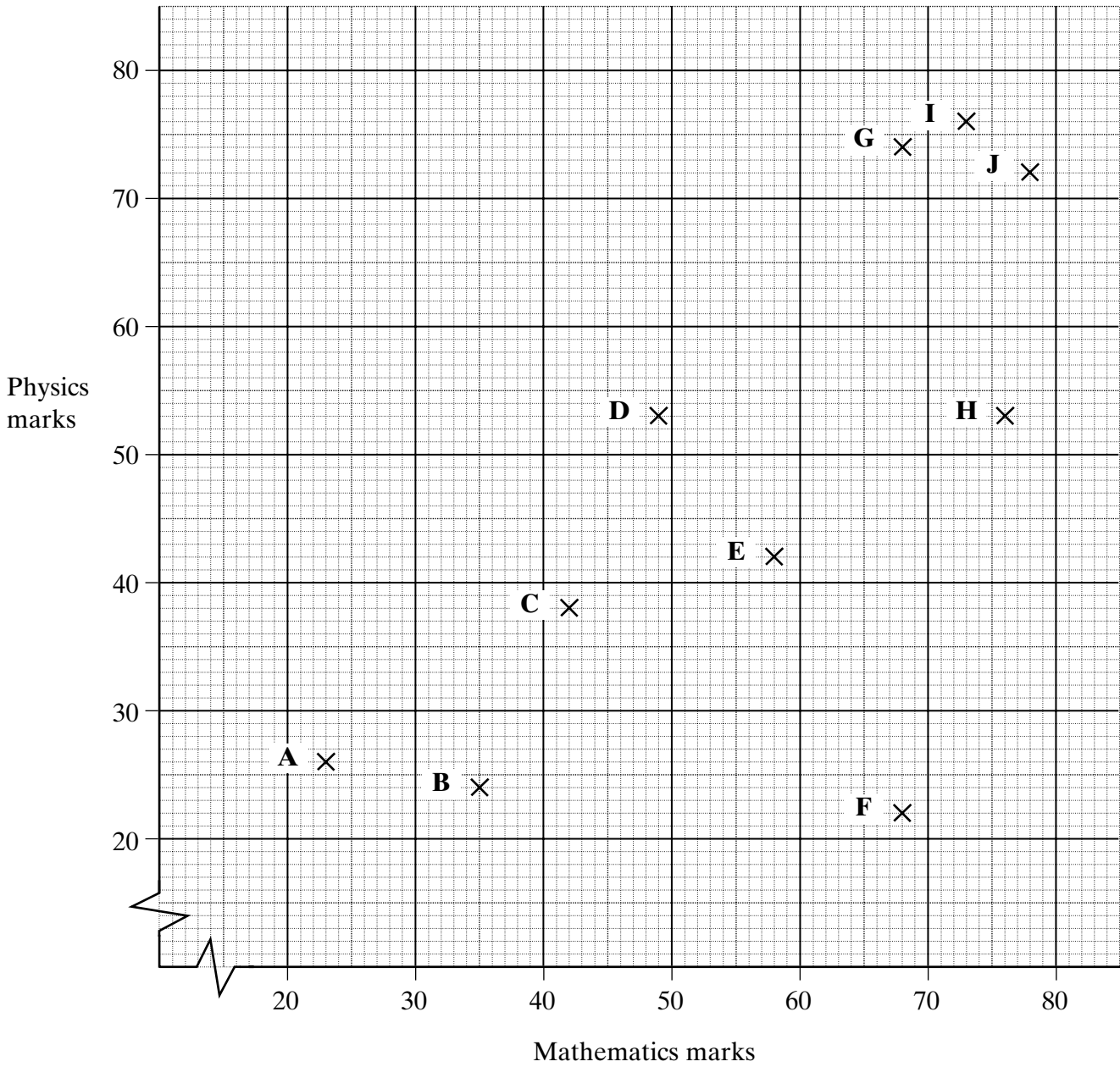
(a) Complete the table.

Pupil	A	B	C	D	E	F	G	H	I	J
Mathematics mark	23	35	42				68		73	78
Physics mark	26	24	38				74		76	72

(3 marks)

(b) The mean mark for Mathematics is 57.

The mean mark for Physics is 48.

Draw a line of best fit on the scatter diagram.

(2 marks)

(c) A pupil who was absent for the Mathematics test obtained 60 marks in Physics. Use your line of best fit to estimate this pupil's mark in Mathematics.

Answer .... marks   *(1 mark)*

(d) Comment on the performance of candidate **F** in the two tests.

....

....

....

(1 mark)

TURN OVER FOR THE NEXT QUESTION

7

Turn over ▶

9 Rashid has a savings box containing 20 coins.

Six of these are 10p coins. The remainder are 50p coins.

Rashid selects, at random, one coin at a time from the box. He does **not** replace the coin.

(a) What is the probability that the first coin he selects will be a 10p coin?

Answer .... *(1 mark)*

(b) If the first coin he selects is a 10p coin, what is the probability that the second coin he selects will also be a 10p coin?

Answer .... *(1 mark)*

(c) Complete the tree diagram below to show all the possible ways in which Rashid could select the first two coins.

First coin   **Second coin**

```
                                        .........        10p
                               10p  <
                                        .........        50p
           .........

                                          6/19           10p
           14/20                 50p  <
                                         13/19           50p
```
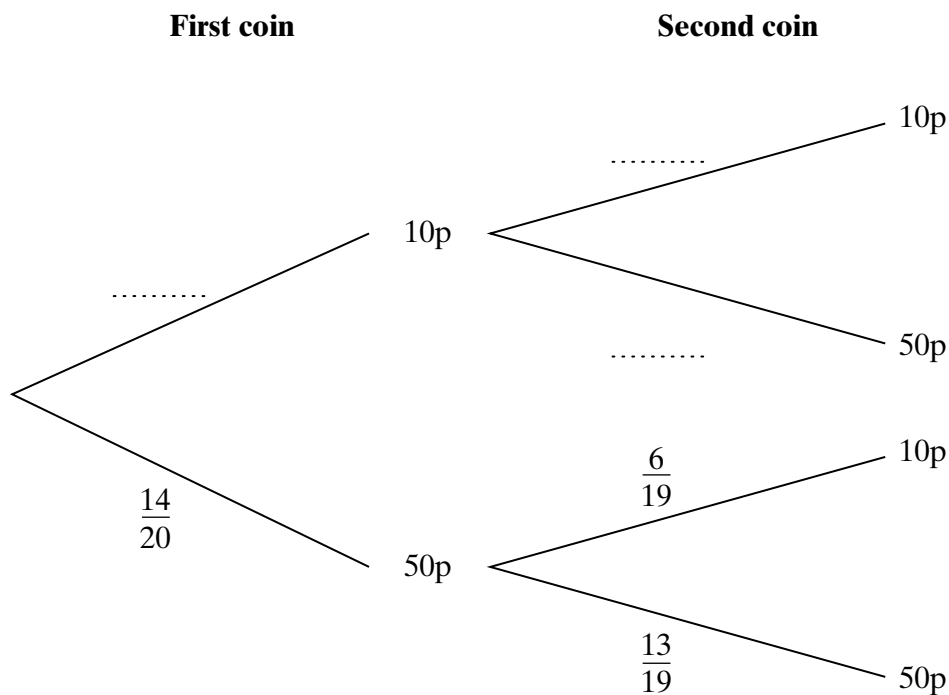
(2 marks)

(d) Use the tree diagram, or otherwise, to calculate the probability that the first two coins selected are

   (i) both 10p coins,

   ....

   ....

   Answer ....   *(2 marks)*

   (ii) both of the same value,

   ....

   ....

   ....

   Answer ....   *(3 marks)*

   (iii) both different values.

   ....

   ....

   ....

   Answer ....   *(2 marks)*

(e) If the first six coins Rashid selects are all 10p coins, what is the probability that the next coin selected is

   (i) a 10p coin?

   Answer ....   *(1 mark)*

   (ii) a 50p coin?

   Answer ....   *(1 mark)*

Turn over ▶

10 Expectation of life is the further number of years which a person of a certain age and gender may expect to live.

The table gives this information for United Kingdom residents in the years 1931 and 1991.

> The table, adapted from 'Social Trends' (2002), is not reproduced here due to third-party copyright constraints.
>
> The full copy of this paper can be obtained by ordering 3311/F from AQA Publications
> Tel: 0161 953 1170

For example, in 1931 a man aged 30 could expect to live another 38 years.

(a)   (i)   Write down how many years a woman aged 30 in 1931 could expect to live.

Answer ....   *(1 mark)*

(ii)   Compare the data for men with that for women.

What conclusion can you draw?

....

....
(1 mark)

(b)   The expectation of life of both men and women in 1991 is longer than in 1931.
Give a possible reason for this.

....

....
(1 mark)

(c) (i) Comment on the life expectancy in 1931 of children at birth and at 1 year old.

....

....

(1 mark)

(ii) Give a possible reason for this.

....

....

(1 mark)

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

11 In May 2001 an estate agent sold nine, three-bedroomed houses.
The sale prices in pounds were:

59 200	65 000	52 000
129 500	52 000	62 500
54 500	57 900	56 000

(a) Write down the mode of these prices.

Answer £ .... *(1 mark)*

(b) (i) Calculate the mean of these prices.

....

....

Answer £ .... *(2 marks)*

(ii) Give a **disadvantage** in using the mean to represent these prices.

....

....

(1 mark)

(c) State whether each of the following variables is qualitative, discrete or continuous.

(i) The time taken for the estate agent to sell one of these three-bedroomed houses

Answer .... *(1 mark)*

(ii) The sale price of a three-bedroomed house

Answer .... *(1 mark)*

(iii) The gender of the estate agent

Answer .... *(1 mark)*

(d) The estate agent receives 400 enquiries for a particular house.
He decides to take a simple random sample of 10% of this group to find out how many have a house to sell.

(i) Describe how this sampling method could be carried out.

....

....

....

....

(3 marks)

(ii) Give **two** reasons why he should **not** base his sample on the first 40 people who rang his office to enquire about the house on Monday morning after 10 am.
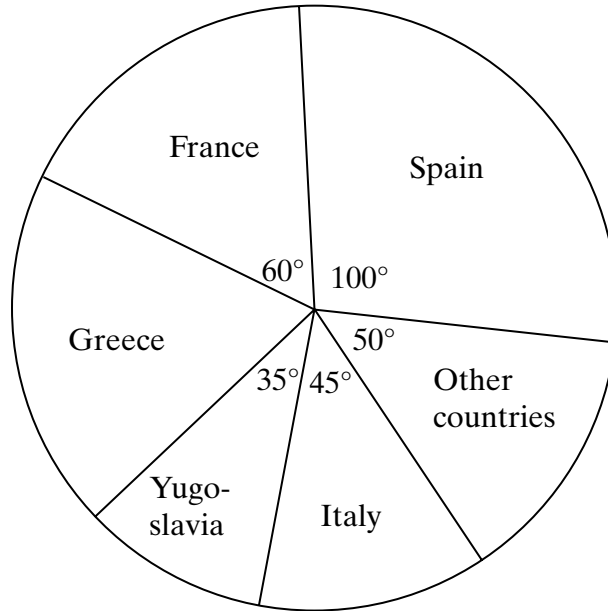
Reason 1 ....

....

....

Reason 2 ....

....

....

(2 marks)

TURN OVER FOR THE NEXT QUESTION

12 A travel agent kept a record of the destinations of those customers who travelled abroad one summer.

This information is illustrated in the pie chart below. Angles shown are given to the nearest degree.

France — 60°
Spain — 100°
Other countries — 50°
Italy — 45°
Yugo-slavia — 35°
Greece

(a) Calculate the percentage of these customers who travelled to Yugoslavia.

....

....

....

Answer .... %   *(2 marks)*

(b) 468 of their customers travelled abroad.
Calculate the number of their customers who travelled to Greece.

....

....

....

....

Answer ....   *(3 marks)*

13 The table gives the number of pairs of shoes sold by size and width fitting by a local shop.

		Width fitting				
		C	**D**	**E**	**F**	**Total**
Shoe size	**5**	3	5	3	2	13
	6	4	7	8	3	22
	7	2	4	5	3	14
	8	1	2	3	1	7
	Total	10	18	19	9	56

(a) What is the probability that a person selected at random buys a pair of shoes of size 5, width D?

Answer .... *(1 mark)*

(b) What is the probability that a person selected at random buys a pair of size 5 shoes?

Answer .... *(1 mark)*

(c) What is the probability that a person selected at random buys shoes of width D, given that they bought shoes of size 5?

....

....

Answer .... *(2 marks)*

(d) Two people are selected at random.

What is the probability that they both bought shoes of size 5?

....

....

....

Answer .... *(3 marks)*

14 Fifteen teams took part in a quiz.
Their scores are as follows:

81	64	75	70	68
78	74	69	76	72
62	82	53	75	69

(a) Draw an ordered stem and leaf diagram to illustrate these data.

Key : 8 | 1 means 81 *(3 marks)*
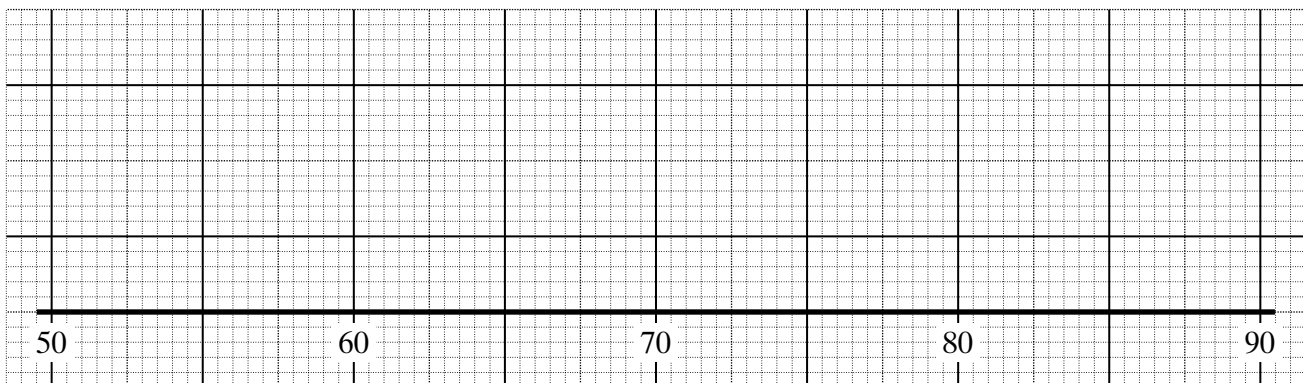
(b) Find the median and quartiles of the scores.

Median ....

Lower quartile ....

Upper quartile ....

(3 marks)

(c) Draw a box and whisker plot to illustrate these data.

50 60 70 80 90

Scores

(3 marks)

END OF QUESTIONS