

Representation of Data

Box Plots:

Jun
05

- 3 The stem-and-leaf diagram shows the prices, to the nearest 10p, of 40 similar items in two stores.

Store A		Store B
9 8 0	1	3 4 6 7
9 8 8 7 7 6 5 5 2 1	2	0 1 2 3 5 7 8 8 8 9 9
9 9 8 5 5 4 4 4 2 2 0	3	1 1 2 2 2 3 3 4 4 5 7 8 8 9 9
9 9 8 8 7 6 6 5 5 5 3 2 1	4	0 0 1 1 2 3 4 4 6 7
3 2 1	5	

Key: 1 | 4 | 0 means Store A's price is £4.10 and Store B's price is £4.00.

- (i) Find the values of the lower quartile, median and upper quartile for Store A's prices. [3]
- (ii) Draw, on graph paper, a box-and-whisker plot of Store A's prices. [3]
- (iii) Briefly compare
- (a) the variability of the prices in the two stores, [1]
- (b) the shapes of the distributions. [1]

- 2 The stem-and-leaf diagram below shows the resting pulse rate, in heartbeats per minute, for a sample of 34 female students and 14 male students.

Female students		Male students
9 4 4	5	
8 8 7 7 7 7 6 6 4 2	6	5 6 7
9 7 7 6 6 5 4 2 2 1 0 0	7	1 2 5 5 5 6 9
9 8 8 4 4 3 2 0 0	8	3 3
	9	5 7

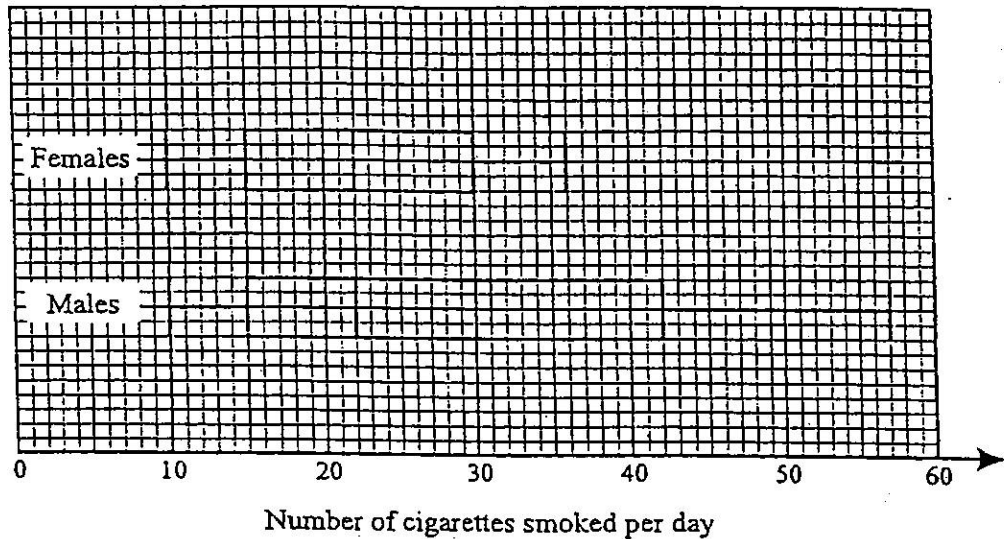
For example, in the second row of the diagram, 2 | 6 | 5 represents a female student's resting pulse rate of 62 and a male student's resting pulse rate of 65.

Jan
01

- (i) Calculate
- (a) the median of the male students' resting pulse rates, [1]
- (b) the interquartile range of the male students' resting pulse rates. [3]
- (ii) On graph paper draw a box-and-whisker plot to represent the data for the male students. [3]
- (iii) The median resting pulse rate for the female students is 72. The lower and upper quartiles of the resting pulse rates for the female students are 67 and 80 respectively. On the same diagram as in part (ii), draw a box-and-whisker plot to represent the data for the female students. [1]
- (iv) Using your two box-and-whisker plots, state one difference between the data for the male students and the data for the female students. [1]

Box Plots (cont 1)

- 6 A survey was carried out into the number of cigarettes smoked in a particular day by a sample of 30 smokers. Fifteen of the smokers were female and fifteen were male. The results are shown in the box-and-whisker plot below.



Jan
03

- (i) State the median number of cigarettes smoked by
- the females,
 - the males.
- [2]
- (ii) Calculate the interquartile range of
- the female data,
 - the male data.
- [3]
- (iii) Use the box-and-whisker plots to state one similarity and one difference when comparing the male data with the female data.
- [2]
- (iv) The number of cigarettes smoked on that particular day is given for each of the male smokers in the list below.
- 23, 30, 37, 18, 15, 22, 44, 57, 15, 20, 22, 42, 14, 10, 47.
- Construct a stem-and-leaf diagram for the male data given in the list above.
- [3]
- State one advantage of a stem-and-leaf diagram compared with a box-and-whisker plot.
- [1]

Box Plots (cont 2)

- 7 In a science lesson, Shivani measured the masses of 20 small objects. Their masses, in grams to the nearest 0.1 g, are given below, in numerical order.

1.6 2.2 3.0 3.1 3.4 4.1 4.2 4.7 4.7 4.8
5.2 5.3 5.3 5.4 5.5 5.8 5.8 5.8 5.9 6.1

JAN
05

- (i) Find the median and interquartile range of this set of data. [3]
(ii) Draw, on graph paper, a box-and-whisker plot of the data. [3]

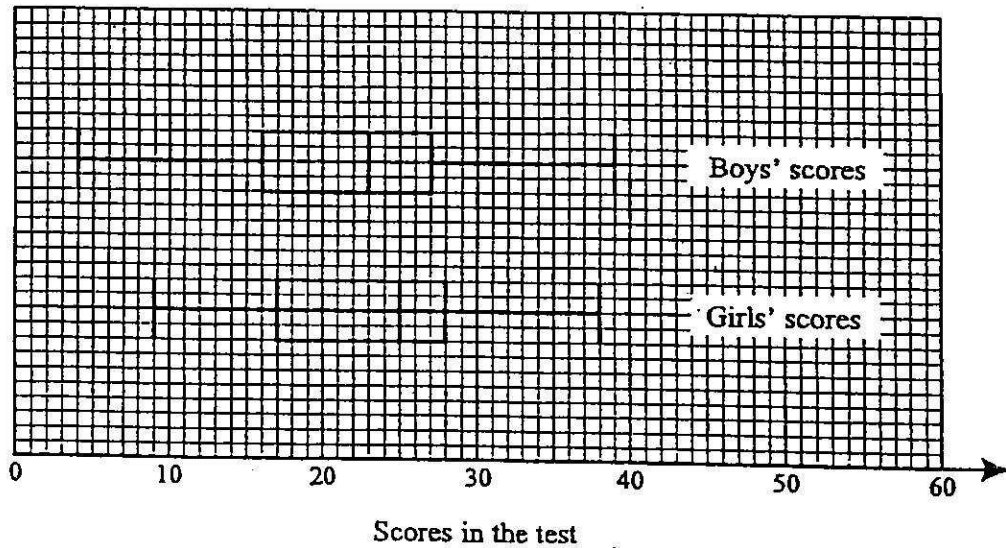
During the same science lesson Emma also weighed 20 small objects, correct to the nearest 0.1 g, and obtained the following values:

lower quartile 4.5 g, median 5.1 g, upper quartile 6.0 g.

- (iii) Compare Shivani's and Emma's data, referring both to the shapes of the distributions and to their variability. [3]

- 7 (v) A box-and-whisker plot of the boys' and girls' scores is shown below.

NOV
02



- (a) State the gender of the student who got the highest score in the test and give the corresponding score. [1]
(b) Use the box-and-whisker plot to make two statements comparing the overall performances of boys and girls in the test. [2]

Box Plots (Cont 3)

- 6 Two chess players, A and B, play in a tournament. Each player plays against 11 different opponents. Each game concludes when either the player has won, his opponent has won, or the game has ended in a draw. The time, correct to the nearest minute, for each game to conclude was noted and the results are given below.

Player A:	7	23	32	32	33	41	46	56	56	61	62
Player B:	3	7	8	8	14	26	27	37	37	41	58

May
02

- (i) For player A's times, find
- (a) the median, [1]
 - (b) the upper quartile, [1]
 - (c) the lower quartile. [1]
- (ii) On graph paper, using the same axis, draw two box-and-whisker plots to represent the times of the games played by A and B. [6]
- (iii) Use your diagram to make two statements comparing the two sets of data. [2]
- (iv) Can you state from the diagram or from the data which player was the more successful? Give a reason for your answer. [1]

- 1 The stem-and-leaf diagram below shows the age in completed years when each person in a sample of 28 males and 16 females was married for the first time.

Male		Female
	7 1	8 9
8 8 7 7 4 4 3 1 1 0 0	2	0 0 0 1 1 1 1 2 7
5 5 3 1 1 0 0 0 0 0	3	0 0 1 2
8 4 4 3 1	4	0
0	5	

Nov
03

For example, in the first row of the diagram 7 | 1 | 8 represents a male who first married at age 17 years and a female who first married at age 18 years.

- (i) Calculate
- (a) the median value of the males' ages when first married, [1]
 - (b) the interquartile range of the males' ages when first married. [2]
- (ii) The median age for the female data is 21 and the interquartile range for the female data is 10. Make two statements comparing the nature of the male and female data. [2]