# **Statistics – Follow up**

If you got question 1 wrong in the Basic Skills Test, read and complete Section 1. If you got question 2 wrong in the Basic Skills Test, read and complete Section 2. If you got question 3 wrong in the Basic Skills Test, read and complete Section 3.

etc....

## Section 1

To calculate the mean of a data set (list of numbers), find the total and divide by the size of the data set (number of numbers in the list).

For example, to find the mean of 24, 36, 72, 48: -

- Find the total: 24 + 36 + 72 + 48 = 180
- Divide the total by 4 because there are 4 numbers in the data set:  $180 \div 4 = 45$
- The mean is 45

To find the mean of 27, 19, 19, 41, 33: -

- Find the total: 27 + 19 + 19 + 41 + 33 = 139
- Divide the total by 5 because there are 5 numbers in the data set:  $139 \div 5 = 27.8$
- The mean is 27.8

Notice that the mean of a group of whole numbers may not be a whole number.

Now calculate the mean of these groups of numbers.

**1)** 33, 35, 40, 50, 42

2) 48, 48, 52, 60

**3)** 17, 23, 19, 27

**4)** 60, 66, 66, 66, 72, 84

5) 46, 47, 48, 49, 53

6) 93, 95, 95, 97, 101, 101, 107, 113

7) 63, 70, 84, 91, 91, 105, 77, 119

**8)** 23, 395, 113, 276, 139

#### Section 2

To find the median of a data set, arrange it in order (smallest to largest) and select the middle number in the set: that's the median

For example, to find the median of 56, 87, 36, 29, 74:-

- Arrange the numbers in order: 29 36 56 74 87
- Find the middle number: 29 36 <u>56</u> 74 87
- The median is 56

If there are an even number of numbers in the set, find the middle two numbers, add them together and divide the answer by 2.

For example, to find the median of 56, 87, 36, 29, 43 and 74,

- Arrange the numbers in order: 29 36 43 56 74 87
- Find the middle two numbers: 29 36 43 56 74 87
- Add them together: 43 + 56 = 99
- Divide by 2 99 ÷ 2 = 49.5
- The median is 49.5

Now find the median of each of the following data sets:-

**1)** 77, 64, 93, 81, 76

**2)** 4.6, 4.9, 5.1, 4.9, 4.9

3) 32, 36, 32, 37, 38, 29

4) 117, 129, 118, 132, 116, 109

**5)** 14, 17, 17, 17, 19, 15, 16

**6)** 179, 123, 147, 111, 181, 131

### Section 3

The mode is the number which appears most often in a data set.

For example, for the set below, the mode is 17.

16, 17, 19, 17, 19, 17, 16

It is possible that all the numbers in a set are different. That means there is not a mode so just write "no mode".

Find the mode (if possible) for each of these data sets:-

**1)** 8, 9, 10, 8, 9, 10, 8

**2)** 16, 18, 16, 19, 16, 15, 16

**3)** 78, 98, 66, 45, 106, 72

**4)** 33, 45, 64, 23, 34, 45, 38

**5)** 56, 67, 56, 56, 56, 67, 67, 78, 67, 67

**6)** 104, 99, 105, 89, 76, 90, 108

### Section 4

The range tells us about the spread of a set of numbers.

Look at the scores two pupils received in their last five maths tests: -

Matthew: 34%, 89%, 93%, 67%, 18% Lucy: 79% 78%, 71%, 80%, 75%

With only a few scores it is easy to see that Matthew's marks are all over the place but Lucy's marks are pretty consistent. If there were hundreds or thousands of numbers in the set it would not be easy to notice this so the range is calculated. To calculate the range, find the highest number in the set then the lowest number and subtract

For Matthew: -

- Highest mark = 93
- Lowest mark = 18
- Range = 93 18 = 75

For Lucy: -

- Highest mark = 80
- Lowest mark = 71
- Range = 80 71 = 9

Calculate the range for these sets of numbers: -

**1)** 45, 68, 33, 89, 65, 44

- **2)** 116, 112, 117, 113, 119, 115, 118, 111
- **3)** 46, 64, 44, 66, 46, 64, 44
- 4) 799, 987, 998, 978, 788, 879
- **5)** 17, 17, 17, 17, 17, 17, 17, 17, 17

## Section 5



In this scattergraph :-

- A scored 3/5 in maths and 4/5 in science
- B scored 4/5 in maths and 4/5 in science
- C scored 4/5 in maths and 3/5 in science
- D scored 3/3 in maths and 3/5 in science

1) Look at the scattergraph below.



- a) Who scored 60% in English and 100% in maths?
- b) Who scored 20% in maths and 40% in English?
- c) Who scored 60% in English and 40% in maths?
- d) Who scored 80% in Maths and 100% in English?
- e) Who scored 40% in English and 60% in maths?
- 2) Look at the graph below and write down the maths and English marks for each person.



## Section 6



Match the correct graph to the statement: -

- 1) Older pupils spend less time on their phones
- 2) All pupils spend about the same time on their phones
- 3) Older pupils spend more time on their phones

4) Pupils spend different amounts of time on their phones but this is not affected by their age.







## Section 7

A stem and leaf diagram is a way of displaying a list of numbers.

For example, if you checked the price of a packet of salt and vinegar crisps in ten different shops you data may look like this:-

80 65 45 65 50 65 55 65 60 70 75 70

It is helpful to arrange the numbers in order because that makes it easier to pick out the highest and lowest prices and it is obvious if more than one shop is charging the same price.

45 50 55 60 65 65 65 65 70 70 75 80

Taking a new row for prices in the forties, fifties, sixties etc. is almost a stem and leaf diagram.

45

50 55

60 65 65 65 65

70 70 75

80

Organising the data in this way makes it clear that half of the shops are charging between sixty and seventy pence for the crisps.

To save writing in a stem and leaf diagram we only write the forty, fifty sixty or whatever once and we include the number of prices in the diagram and an explanation of what each number means (the "key")



1) Prices of a 330ml can of Diet Coke

5 9 6 59 7 055599 8 5 9 0

n = 11 5 | 9 means 59p

a) How many prices were recorded?

b) What is the highest price for a can of Diet Coke?

c) What is the lowest price?

- d) What is the most common price?
- e) How many shops are charging more than 80p?
- f) How many shops are charging less than 70p?

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

n = 24 3 3 means £33 000 per year

a) How many people were asked about their pay?

**b)** What is the lowest pay in a year?

c) What is the highest pay in a year?

d) What was the most common pay?

e) How many people earned more than £30 000 in a year?

f) How many people earned less than £30 000 in a year?