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**FUNCTIONAL SKILLS**

Maths Level 2





**Area: Handling information and data**

Criterion 25: Use the mean, median, mode and range to compare two sets of data

**Calculating the mean**

The mean is a type of average. An average is a number that gives an overview of collected data. The mean can be calculated in 2 steps.

1. Add up all the numbers in the data set
2. Divide the total by how many numbers there are

**Question 1**

A teacher records the number of books read by 6 students in a month.   
Here are the results:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 12 | 19 | 5 | 4 | 7 | 4 |

Calculate the mean.

(Show your working out.)

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**Question 2**

The table shows the length of different children’s heights in centimetres (cm).

What is the mean height of the children?

|  |  |
| --- | --- |
| **Child** | **Height (cm)** |
| Child 1 | 99 |
| Child 2 | 113 |
| Child 3 | 122 |
| Child 4 | 108 |
| Child 5 | 95 |

(Show your working out.)

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**Question 3**

4 students sit the same maths exam. Their results are shown in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| 17 | 13 | 18 | 16 |

Calculate the mean exam score.

(Show your working out.)

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**Calculating the median**

The median is a type of average. An average is a number that gives an overview of collected data. It is the middle value. The median can be calculated in 2 steps.

1. Order the numbers from smallest to largest
2. Find the middle value

**Question 4**

Below are some ratings for a new restaurant in the local shopping centre.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 46 | 39 | 31 | 44 | 47 | 35 | 33 |

Calculate the median score.

(Show your working out.)

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**Question 5**

A local supermarket records the amount of money the previous 6 customers spent in the store.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| £46.00 | £13.90 | £65.00 | £154.94 | £94.70 | £34.25 |

Calculate the median amount spent.

(Show your working out.)

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**Question 6**

Cards are numbered from 0 to 20. Jay chooses 8 cards.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 13 | 7 | 6 | 1 | 18 | 14 | 11 | 6 |

Calculate the median score.

(Show your working out.)

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**Calculating the mode**

The mode is another type of average. The mode is the most common value in a data set. The mode can be calculated in 2 steps.

1. Order the numbers
2. Find the most frequent (or most common) value

Sometimes, there will be more than 1 mode. When this occurs, **all** modes must be stated as the answer.

**Question 7**

The local shopping centre is checking their online reviews.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2 | 5 | 1 | 3 | 4 |
| 5 | 2 | 3 | 5 | 4 |

Calculate the mode.

(Show your working out.)

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**Question 8**

The cattery is counting how many cats have been dropped off at their centre over the past 5 days.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 12 | 5 | 9 | 3 | 5 |

Calculate the mode.

(Show your working out.)

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**Question 9**

Calculate the mode of these numbers.

|  |  |  |  |
| --- | --- | --- | --- |
| 52 | 54 | 56 | 25 |
| 63 | 64 | 52 | 63 |

Calculate the mode.

(Show your working out.)

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**Calculating the range**

The range is another type of average. The range provides information on the difference between the largest and smallest values in a data set. The range can be calculated in 2 steps.

1. Find the largest and smallest values
2. Subtract the smallest number from the largest

**Question 10**

The local shopping centre is checking their online reviews.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2 | 5 | 1 | 3 | 4 |
| 5 | 2 | 3 | 5 | 4 |

Calculate the range.

(Show your working out.)

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**Question 11**

Cards are numbered from 0 to 20. Jay chooses 8 cards.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 13 | 7 | 6 | 1 | 18 | 14 | 11 | 6 |

Calculate the range.

(Show your working out.)

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**Question 12**

The table shows different children’s heights in centimetres (cm).

Calculate the range.

|  |  |
| --- | --- |
| **Child** | **Height (cm)** |
| Child 1 | 99 |
| Child 2 | 113 |
| Child 3 | 122 |
| Child 4 | 108 |
| Child 5 | 95 |

(Show your working out.)

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**Comparing 2 sets of data**

To compare 2 data sets, calculate the mean, median, mode or range for each set of data to see what they reveal about each set’s characteristics.

For example:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Season 1** | 7 | 15 | 8 | 1 | 8 |
| **Season 2** | 12 | 9 | 5 | 9 | 9 |

The table shows the number of goals a football club scored each week over 2 seasons.

Calculate the modal goals scored in each season.

Which season has the lowest modal score?

**Question 13**

The table shows the number of goals a football club scored each week over 2 seasons.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Season 1** | 7 | 7 | 12 | 1 | 13 |
| **Season 2** | 12 | 6 | 5 | 14 | 6 |

Calculate the **modal** goals scored in each season.

Which season has the **highest** modal score?

(Show your working out.)

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**Exam practice 1**

Jay, Shannon and Alex are competing in a ring toss game at the local fair.

|  |  |  |
| --- | --- | --- |
| **Jay** | **Shannon** | **Alex** |
| 2 | 15 | 4 |
| 12 | 9 | 6 |
| 5 | 8 | 10 |
| 9 | 4 | 6 |
| 7 | 12 | 14 |

Who has the **highest range** of scores?

(Show your working out.)

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**Exam practice 2**

A streaming company are comparing the number of viewers 2 shows had in the past 5 days.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| **Show 1** | 2.4 million | 2.7 million | 3.1 million | 2.8 million | 2.5 million |
| **Show 2** | 3.6 million | 2.9 million | 2.2 million | 2.6 million | 2.3 million |

Which show has the **highest mean** viewership?

(Show your working out.)

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**Answers**

**Calculating the mean**

**Question 1**

8.5

**Question 2**

107.4

**Question 3**

16

**Calculating the median**

**Question 4**

39

**Question 5**

46 and 65. Find the middle (average) of these values.

46 + 65 = £111

111 ÷ 2 = £55.50

**Question 6**

7 and 11. Find the middle (average) of these values.

7 + 11 = 18

18 ÷ 2 = 9

**Calculating the mode**

**Question 7**

5

**Question 8**

5

**Question 9**

Both 52 and 63 appear twice.

This dataset has 2 modes: 52 and 63.

**Calculating the range**

**Question 10**

5 – 1 = 4

**Question 11**

18 – 1 = 17

**Question 12**

122 – 95 = 27cm

**Comparing 2 sets of data**

**Question 13**

The modal score for season 1 is 7.

The modal score for season 2 is 6.

Season 1 has the highest modal score.

**Exam practice 1**

Jay’s range is 10.

Shannon’s range is 11.

Alex’s range is 10.

Therefore, Shannon has the highest range.

**Exam practice 2**

The mean viewership for show 1 is 2.7 million.

The mean viewership for show 2 is 2.72 million.

Therefore, show 2 has the highest mean score.

**Your functional skills exam**

Your functional skills exams will consist of 2 papers.   
These papers will take place over the following time periods:

* Non-calculator paper – 40 minutes
* Calculator – 1 hour 50 minutes

Further information on the format that your test will take can be obtained from your training provider.

**Hints and tips**

* Find out what format your exam will be in. It may be paper-based   
  or on-screen.
* Plan what you are going to revise in advance. Don’t leave it until the last minute.
* Do as many past papers as you can so you are prepared for the day. If possible, try to complete the past papers following the same format as the actual exam.
* Find a quiet place to study and revise. It helps to sit at a table or a desk, don’t revise in bed.
* Don’t stay up all night revising the night before your exam. It’s important to have a good rest so you feel refreshed and ready to go.
* Read the question 3 times. The first time to ensure you understand what is being asked, the second time to get an understanding of what you need to do, and a third time to figure out exactly what maths techniques you should be applying.
* If you are struggling with a question, skip it and come back to it later. Try not to sit getting worked up about a difficult question, it will only waste exam time. Move on and come back to it after you have answered the other questions.
* Take note of the number of marks available. This will give you an indication of how much working out you must show. For example, 1 mark will need an answer only and more marks will need you to show your working out.
* When you’ve finished the exam, go back and check your answers. If you still have time remaining, use it to check your answers and when you have checked your answers check them again.