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**FUNCTIONAL SKILLS**

Maths Level 2



**Area: Handling information and data**

Criterion: Estimate the mean of a grouped frequency distribution from discrete 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**

Alex rolls a die. Here are their results:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 3 | 4 | 1 | 3 | 5 | 2 | 2 |

Calculate the mean.

(Show your working out.)

|  |
| --- |
|  |

**Question 2**

The table shows the times individuals took to run 100m.

What is the mean time taken?

|  |  |
| --- | --- |
| **Runner** | **Time (seconds)** |
| Jo | 19.6 |
| Jamie | 30.1 |
| Alex | 21.5 |
| Sam | 20.8 |
| Max | 24.5 |

(Show your working out.)

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**Question 3**

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 23 | 17 | 28 | 21 | 19 |
| 12 | 30 | 18 | 24 | 25 |

Calculate the mean exam score.

(Show your working out.)

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**Question 3b**

Round your answer to the nearest whole number.

(Show your working out.)

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| --- |
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**Grouped frequency**

Grouped frequency is a method of organising and presenting data. It groups values into intervals or ranges. These groups do not overlap.

|  |  |
| --- | --- |
| **Height (inches)** | **Frequency** |
| 60 < H ≤ 65 | 4 |
| 65 < H ≤ 70 | 12 |
| 70 < H ≤ 75 | 8 |

To calculate the mean of grouped frequency:

* find the midpoint, or mid-range, of each group
* work out the frequency x midpoint
* calculate the total frequency
* work out the mean

**Question 4a**

Using the information in the grouped frequency table, calculate the mean height.

|  |  |  |  |
| --- | --- | --- | --- |
| **Height (inches)** | **Frequency** | **Midpoint** | **Frequency x midpoint** |
| 60 < H ≤ 65 | 7 |  |  |
| 65 < H ≤ 70 | 10 |  |  |
| 70 < H ≤ 75 | 5 |  |  |
| 75 < H ≤ 80 | 2 |  |  |

(Show your working out.)

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**Question 4b**

Round your answer to the nearest whole number.

(Show your working out)

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| --- |
|  |

**Exam practice 1**

You want to find out the mean number of guests who have attended your events throughout the past year.

|  |  |
| --- | --- |
| **Number of guests** | **Frequency** |
| 0 < N ≤ 100 | 38 |
| 100 < N ≤ 200 | 71 |
| 200 < N ≤ 300 | 56 |
| 300 < N ≤ 400 | 24 |
| 400 < N ≤ 500 | 9 |

Estimate the mean number of guests.

Round your answer to the nearest whole number.

(Show your working out.)

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| --- |
|  |

**Exam practice 2**

You want to find out the mean speed of vehicles travelling past the local school in the village. A camera records different cars’ speeds from 3pm to 4pm. The results are shown below:

|  |  |
| --- | --- |
| **Speed (*S*) in miles per hour (mph)** | **Frequency**  **(No. of cars)** |
| 10 < N ≤ 15 | 7 |
| 15 < N ≤ 20 | 16 |
| 20 < N ≤ 25 | 21 |
| 25 < N ≤ 30 | 14 |
| 30 < N ≤ 35 | 2 |

(Show your working out.)

|  |
| --- |
|  |

**Answers**

**Calculating the mean**

**Question 1**

3.25

**Question 2**

29.5 seconds

**Question 3a**

21.7

**Question 3b**

22

**Grouped frequency**

**Question 4a**

|  |  |  |  |
| --- | --- | --- | --- |
| **Height (inches)** | **Frequency** | **Midpoint** | **Frequency x midpoint** |
| 60 < H ≤ 65 | 7 | 62.5 | 437.5 |
| 65 < H ≤ 70 | 10 | 67.5 | 675 |
| 70 < H ≤ 75 | 5 | 72.5 | 362.5 |
| 75 < H ≤ 80 | 2 | 77.5 | 155 |

Total frequency x midpoint: 1630

Total frequency: 24

Mean: 1630 ÷ 24 = 67.92

**Question 4b**

68

**Exam practice**

**Exam practice 1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Number of guests** | **Frequency** | **Midpoint** | **Frequency x midpoint** |
| 0 < N ≤ 100 | 38 | 50 | 1,900 |
| 100 < N ≤ 200 | 71 | 150 | 10,650 |
| 200 < N ≤ 300 | 56 | 250 | 14,000 |
| 300 < N ≤ 400 | 24 | 350 | 8,400 |
| 400 < N ≤ 500 | 9 | 450 | 4,050 |

Total frequency x midpoint: 39,000

Total frequency: 198

Mean: 39,000 ÷ 198 = 196.97

Rounded to the nearest whole number = 197

**Exam practice 2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Speed (*S*) in miles per hour (mph)** | **Frequency**  **(No. of cars)** | **Midpoint** | **Frequency x midpoint** |
| 10 < N ≤ 15 | 7 | 12.5 | 87.5 |
| 15 < N ≤ 20 | 16 | 17.5 | 280 |
| 20 < N ≤ 25 | 21 | 22.5 | 472.5 |
| 25 < N ≤ 30 | 14 | 27.5 | 385 |
| 30 < N ≤ 35 | 2 | 32.5 | 65 |

Total frequency x midpoint: 1,290

Total frequency: 60

Mean: 1,290 ÷ 60 = 21.5

**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.