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YEAR 10 MATHS – DATA HANDLING

TARGET GRADE 6

SUMMER LEARNING PROGRAMME

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**Mean, Mode, Median and Range and Mean from a Table**

**1.** Here are 10 numbers.

3 2 5 4 2 4 6 2 1 2

Find the mode of these numbers.

(1 mark)

**2.** Work out the median of these 15 numbers.

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

( 2 marks)

**3.** Chloe made a list of her homework marks.

4 5 5 5 4 3 2 1 4 5

(a) Write down the mode of her homework marks.

(1 mark)

(b) Work out her mean homework mark.

(2 marks)

**4.** Jalin wrote down the ages, in years, of seven of his relatives.

45, 38, 43, 43, 39, 40, 39

(a) Find the median age.

(1 mark)

(b) Work out the range of the ages.

(1 mark)

(c) Work out the mean age.

(2 marks)

**5.** Andy did a survey of the number of cups of coffee some pupils in his school had drunk yesterday.

The frequency table shows his results.

|  |  |
| --- | --- |
| Number of cups of coffee | Frequency |
| 2 | 1 |
| 3 | 3 |
| 4 | 5 |
| 5 | 8 |
| 6 | 5 |

1. Work out the number of pupils that Andy asked.

(2 marks)

Andy thinks that the average number of drinks pupils in his survey had drunk is 7.

1. Explain why Andy cannot be correct.

(1 mark)

**6.** There are 10 children in a playgroup.  
The table shows information about the ages, in years, of these children.

|  |  |
| --- | --- |
| Age in years | Frequency |
| 2 | 3 |
| 3 | 5 |
| 4 | 2 |

Work out the mean age of the children (in years).

(3 marks)

**7.** 20 students scored goals for the school hockey team last month.  
The table gives information about the number of goals they scored.

|  |  |  |
| --- | --- | --- |
| Goals scored | Number of students |  |
| 1 | 9 |  |
| 2 | 3 |  |
| 3 | 5 |  |
| 4 | 3 |  |

Work out the mean number of goals scored.

(3 marks)

**8.** 22 students took a short test.  
The table gives information about their marks in the test.

|  |  |  |
| --- | --- | --- |
| **Mark** | **Frequency** |  |
| 7 | 1 |  |
| 8 | 6 |  |
| 9 | 5 |  |
| 10 | 10 |  |

(a) Write down the modal mark.

(1 mark)

(b) Work out the range of the marks.

(1 mark)

(c) Work out the mean mark.

(3 marks)

**9.** A teacher asked 50 children how much pocket money they got each week.  
The table shows some information about their replies.

|  |  |
| --- | --- |
| Pocket money (£*x*) | Frequency |
| 0 < *x*  2 | 1 |
| 2 < *x*  4 | 10 |
| 4 < *x*  6 | 23 |
| 6 < *x*  8 | 14 |
| 8 < *x*  10 | 2 |

Work out the estimate for the mean amount of pocket money (£) the children got.

(4 marks)

**10.** The table shows information about the number of hours that 120 children used a computer last week.

|  |  |
| --- | --- |
| Number of hours (*h*) | Frequency |
| 0 < *h* ≤ 2 | 10 |
| 2 < *h* ≤ 4 | 15 |
| 4 < *h* ≤ 6 | 30 |
| 6 < *h* ≤ 8 | 35 |
| 8 < *h* ≤ 10 | 25 |
| 10 < *h* ≤ 12 | 5 |

Work out an estimate for the mean number of hours that the children used a computer.  
Give your answer (hours) correct to 2 decimal places.

(4 marks)

**Reading Cumulative Frequency Diagrams**

**1.**



**2.**



**3.**



**4.**



**5.**



**Plotting Cumulative Frequency Diagrams**

**1.** The table shows information about the heights of 40 bushes.

|  |  |  |
| --- | --- | --- |
| Height (*h* cm) | Frequency | Cumulative Frequency |
| 170  *h* < 175 | 5 |  |
| 175  *h* < 180 | 18 |  |
| 180  *h* < 185 | 12 |  |
| 185  *h* < 190 | 4 |  |
| 190  *h* < 195 | 1 |  |

(a) Complete the cumulative frequency table.

(1 mark)

(b) On the grid, draw a cumulative frequency graph for your table.



**(2 marks)**

1. Use the graph to find an estimate for the median height of the bushes.

(1 mark)

**2.** Daniel took a sample of 100 pebbles from Tawny Beach.  
He weighed each pebble and recorded its weight.  
He used the information to draw the cumulative frequency graph shown on the grid.

(a) Use the cumulative frequency graph to find an estimate for

(i) the median weight of these pebbles (in grams).

(ii) the number of pebbles with a weight more than 60 grams.

(3 marks)



Daniel also took a sample of 100 pebbles from Golden Beach.  
The table shows the distribution of the weights of the pebbles in the sample from Golden Beach.

|  |  |
| --- | --- |
| Weight (*w* grams) | Cumulative frequency |
| 0 < *w*  20 | 1 |
| 0 < *w*  30 | 15 |
| 0 < *w*  40 | 36 |
| 0 < *w*  50 | 65 |
| 0 < *w*  60 | 84 |
| 0 < *w*  70 | 94 |
| 0 < *w*  80 | 100 |

(b) On the same grid, draw the cumulative frequency graph for the information shown in the table.

(2 marks)

**3.** 90 students took an examination.  
The grouped frequency table shows information about their results.

|  |  |  |
| --- | --- | --- |
| Mark (*x*) | Frequency | Cumulative Frequency |
| 0 < *x*  10 | 3 | 3 |
| 10 < *x*  20 | 10 |  |
| 20 < *x*  30 | 17 |  |
| 30 < *x*  40 | 30 |  |
| 40 < *x*  50 | 21 |  |
| 50 < *x*  60 | 7 |  |
| 60 < *x*  70 | 2 |  |

(a) Complete the cumulative frequency table.

(1 mark)

(b) On the grid below, draw a cumulative frequency graph for your table.

(2 marks)

(c) Use your graph to find an estimate for the median mark.

(1 mark)

The pass mark for the examination was 28.

(d) Use your graph to find an estimate for the number of students who passed the examination.

(2 marks)



**4.** The table shows information about the number of hours that 120 children used a computer last week.

|  |  |  |
| --- | --- | --- |
| Number of hours (*h*) | Frequency | Cumulative Frequency |
| 0 < *h* ≤ 2 | 10 | 10 |
| 2 < *h* ≤ 4 | 15 |  |
| 4 < *h* ≤ 6 | 30 |  |
| 6 < *h* ≤ 8 | 35 |  |
| 8 < *h* ≤ 10 | 25 |  |
| 10 < *h* ≤ 12 | 5 |  |

(a) Complete the cumulative frequency table.

(1 mark)



(b) On the grid, draw a cumulative frequency graph for your table.

(2 marks)

(c) Use your graph to find an estimate for the number of children who used a computer for **less** than 7 hours last week.

(2 marks)

**Box and Whisker Diagrams**

**1.** Some students took a test.  
The table shows information about their marks.

|  |  |
| --- | --- |
| Minimum mark | 10 |
| Lower quartile | 33 |
| Interquartile range | 35 |
| Median mark | 43 |
| Range | 65 |

Use this information to draw a box plot.



(3 marks)

**2.** The times, in seconds, taken by 11 teachers to solve a puzzle are listed in order

4 12 13 17 18 20 22 24 25 30 34

(a) Find

(i) the lower quartile,

(ii) the interquartile range.

(2 marks)

(b) Draw a box plot for this data.



(3 marks)

**3.** Lottie measured the heights, in centimetres, of the girls in her class.

The table shows some information about the heights.

|  |  |
| --- | --- |
| Height of shortest girl | 137 cm |
| Height of tallest girl | 180 cm |
| Median | 162 cm |
| Lower quartile | 148 cm |
| Upper quartile | 172 cm |

On the grid, draw a box plot to show this information.



(2 marks)

**4.** 200 students took a test.  
The cumulative frequency graph gives information about their marks.



The lowest mark scored in the test was 10.  
The highest mark scored in the test was 60.

Use this information and the cumulative frequency graph to draw a box plot showing information about the students’ marks.



(3 marks)

**Drawing and Interpreting Histograms**

**1.** Batteries are tested by putting them into toys and seeing how long they last. Here are the results of 60 tests.

|  |  |  |  |
| --- | --- | --- | --- |
| **Time, *t (*minutes)** | **Frequency** |  |  |
| 500  *t* < 600 | 8 |  |  |
| 600  *t* < 700 | 15 |  |  |
| 700  *t* < 750 | 10 |  |  |
| 750  *t* < 950 | 18 |  |  |
| 950  *t* < 1150 | 9 |  |  |

1. Draw a histogram to show this information**.**



**(3 marks)**

(b) Use your histogram, or otherwise, to estimate the median (in minutes) life of a battery.

(2 marks)

**2.** In a survey 120 people were asked how far they travel to work each day.

The table shows the results.

|  |  |  |  |
| --- | --- | --- | --- |
| **Distance, *d* (miles)** | **Frequency** |  |  |
| 0 < *d*  5 | 17 |  |  |
| 5 < *d*  10 | 29 |  |  |
| 10 < *d*  20 | 36 |  |  |
| 20 < *d*  30 | 24 |  |  |
| 30 < *d*  50 | 14 |  |  |

1. Draw a histogram to represent this information**.**



**(3 marks)**

(b) Estimate how many people travel more than 22 miles to work.

(2 marks)

**3.** 50 customers leaving a shop were asked how much money they had spent.

The table shows the results.

|  |  |
| --- | --- |
| **Amount *A* (£)** | **Number of customers** |
| 0 < A  10 | 4 |
| 10< A  40 | 24 |
| 40< A  60 | 12 |
| 60< A  100 | 10 |

Draw a histogram to show this information.



(3 marks)

**4.** The histogram shows information about how much time was spent in a supermarket by  
100 shoppers. Complete this frequency table: **(2)**



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Time, *t* (minutes) | 0 < *t*  5 | 5 < *t*  20 | 20 < *t*  30 | 30 < *t*  60 | 60 < *t* 80 |
| Number of shoppers | 6 |  | 15 |  | 25 |

**Probability and Tree Diagrams**

**1.** A weather forecast says

The probability that it will rain on Monday is 0.6  
The probability that it will rain on Tuesday is 0.8

(a) Complete the tree diagram showing the possible outcomes



(1 mark)

(b) Calculate the probability that it rains on just one of the two days.

(3 marks)

**2.** Greg has four suits, one is striped and the other three are plain.  
He also has ten shirts, four are white and the other six are coloured.

Greg chooses a suit at random and then chooses a shirt at random.

(a) Fill in the probabilities on the branches of the tree diagram.



(2 marks)

(b) Calculate the probability that Greg chooses a plain suit and a coloured shirt.

(2 marks)

**3.** The diagram shows a spinner.



When the arrow is spun the probability of scoring 2 is 0.3

The arrow is spun twice and the scores are added.

(a) Complete the tree diagram.



(1 mark)

(b) What is the probability that the total score is 4?

(2 marks)

**4.** A bucket contains tennis balls which are identical apart from their colour.  
There are 5 yellow balls, 3 white balls and 2 green balls in the bucket.

Martina chooses two of the balls at random and without replacement.  
What is the probability that the balls are the same colour?

**(5 marks)**

**5.** In Britain the probability of a 17 year old passing the driving test at the first attempt is 0.6.

Three people are chosen at random from the population of 17 year olds in Britain who are about to take their driving test.

What is the probability that exactly two of them pass the driving test at the first attempt?

(3 marks)

**Statistical Diagrams Summary**

