Week 4 - Descriptive Statistics in Mathematical Modelling

Measures of Central Tendency

1. Find the mean, mean, and mode of the following:

8, 5, 9, 6, 7, 9, 9, 8, 2

2. 31 football players each took 5 penalties. The number of goals they scored is summarised in the table below:

Goals scored	No of player (Frequency)
0	1
1	2
2	4
3	9
4	10
5	5

Find the mean median and mode of the number of goals scored

3. The heights, in metres, of thirty trees is shown in the table below:

Height (m) metres	No. of trees
$5 < h < 15$	7
$15 < h < 25$	5
$25 < h < 35$	13
$35 < h < 45$	3
$45 < h < 55$	2

Estimate the mean, median and mode of the height.

4. 35 people were given the following question;

'How often do you eat meat? 1) Never 2) Rarely 3) Sometimes 4) Often 5) Most days

Their responses are summarised in the table below:

Meat-eating tendency	Frequency
Never	6
Rarely	3
Sometimes	7
Often	7
Most days	12

Find the average 'meat-eating tendency'

5. Some students have their reaction times tested in a physical challenge. The times (in seconds) are listed below:

5.68, 5.84, 6.95, 6.83, 1.87, 6.98, 2.04, 5.92, 6.14, 6.76, 6.26

Calculate the average reaction time

6. A fashion store sells dresses in different sizes. The table below shows the number of varying sizes of a particular dress that are sold in a week.

Size	Frequency
6	0
8	2
10	4
12	4
14	5
16	2

a. Find the mode, mean and median of the data.
b. Which average is the store manager going to be most interested in, and why?

7. The mean height of 4 girls is 158cm Sharon joins the group and the mean becomes 156cm How tall is Sharon? (Clue: Calculate the total height of all the girls)

8. Here is a list of numbers written in order of size;

3 6 x y

The numbers have a median of 8 and a mean of 11 Find the value of x and the value of y.

9. The table shows points scored in a quiz. The mean score is 12. Find the value of x.

Points scored	Frequency
0	3
5	2
10	x
15	8
20	4

(Hint- Find an expression for the mean in terms of x, and solve)

Measures of Variance

1. The marks in a science test were as follows:

58, 64, 42, 75, 90, 56

Find the range.

2. Seven people had the following IQ scores:

125, 130, 96, 111, 84, 126, 108

Find the interquartile range.

3. The lengths in cm of some fish in a tank were as follows:

18, 18, 21, 23, 25

Find the variance.

4. The heart rates of some people were as follows:

95, 155, 131, 160, 145, 98

Find the standard deviation

5. Some students watched a horror movie and afterwards were asked to give a score for how scary they found it using the following:

- 1-Not at all scary, 2-A bit scary, 3-Quite scary, 4-Extremely scary.*

The responses are summarised in the following table:

How Scary?	No. of Students
1	2
2	9
3	8
4	8

Find a suitable measure of variability.

6. Some patients at a health centre were asked to state how many days that they had taken painkillers in the previous week. The responses are summarised in the table below:

No. of times taken painkillers	No. of Students
0	13
1	6
2	8
3	5
4	5
5	1
6	0
7	1

Calculate the standard deviation for the number of painkillers taken.

7. The number of times that students were late for a particular class over the term are in the table below: | No. of times late | No. of Students | |————————-|————————| | 0 | 5 | | 1-3 | 8 | | 4-6 | 5 | | 7-10 | 3 | | 11-15 | 1 | | 16+ | 0 |

Calculate the standard deviation for the number of times that the students were late.