STATISTICS (Q 7, PAPER 2)

LESSON NO. 1: MEAN AND MEDIAN

2007

7 (a) Find the median of the numbers
$$5, 11, 3, 16, 8.$$

SOLUTION

> The **MEDIAN** is the middle number when you line up all the numbers in increasing order.

3, 5, 8, 11, 16
The median is 8.

2002

7 (a) Calculate the mean of the following numbers:
$$1, 0, 1, 5, 2, 3, 9.$$

SOLUTION

> The **MEAN** or **AVERAGE** of a set of numbers is calculated by adding the numbers together and dividing by the number of numbers.
> $$\text{Mean} = \frac{\text{Sum of the numbers}}{\text{Number of numbers}}$$
> The mean is denoted by $\bar{x}$.

$$\bar{x} = \frac{1+0+1+5+2+3+9}{7}$$

$$\bar{x} = \frac{x_1 + x_2 + \ldots\ldots\ldots + x_N}{N} = \frac{\text{Sum of the Numbers}}{\text{Number of Numbers}} = \frac{\sum x}{N} \quad \ldots\ldots \text{①}$$

$$\Rightarrow \bar{x} = \frac{21}{7} = 3$$

1999

7 (a) Four people have a meal in a restaurant. The average cost of the meal per person is IR£12.50, excluding the service charge.
What is the total bill for the four people if a 10% service charge is added?

SOLUTION

$$\bar{x} = \frac{x_1 + x_2 + \ldots\ldots\ldots + x_N}{N} = \frac{\text{Sum of the Numbers}}{\text{Number of Numbers}} = \frac{\sum x}{N} \quad \ldots\ldots \text{①}$$

$$\bar{x} = \frac{\sum x}{N} \Rightarrow \sum x = N\bar{x}$$

$$\Rightarrow \sum x = 4 \times 12.50 = 50$$

The total cost of the meal for the four people is IR£50.
A 10% service charge is added. 10% of IR£50 is IR£5.
The total bill is IR£50 + IR£5 = IR£55.

1998

7   (a)   Find the mean and the median of the following array of numbers:
$$2, 5, 7, 11, 15, 3, 6$$

SOLUTION

> The **MEAN** or **AVERAGE** of a set of numbers is calculated by adding the numbers together and dividing by the number of numbers.
> $$\text{Mean} = \frac{\text{Sum of the numbers}}{\text{Number of numbers}}$$
> The mean is denoted by $\bar{x}$.

$$\bar{x} = \frac{2+5+7+11+15+3+6}{7}$$

$$\bar{x} = \frac{x_1 + x_2 + \ldots\ldots\ldots + x_N}{N} = \frac{\text{Sum of the Numbers}}{\text{Number of Numbers}} = \frac{\sum x}{N} \quad \ldots\ldots \; \mathbf{1}$$

$$\Rightarrow \bar{x} = \frac{49}{7} = 7$$

> The **MEDIAN** is the middle number when you line up all the numbers in increasing order.

2, 3, 5, **6**, 7, 11, 15
You can see that 6 is the median number.

1996

7   (a)   The numbers 3, 5, 6, x, 9, 2 have a mean of 6.
Find x.

SOLUTION

> The **MEAN** or **AVERAGE** of a set of numbers is calculated by adding the numbers together and dividing by the number of numbers.
> $$\text{Mean} = \frac{\text{Sum of the numbers}}{\text{Number of numbers}}$$
> The mean is denoted by $\bar{x}$.

$$\bar{x} = \frac{x_1 + x_2 + \ldots\ldots\ldots + x_N}{N} = \frac{\text{Sum of the Numbers}}{\text{Number of Numbers}} = \frac{\sum x}{N} \quad \ldots\ldots \; \mathbf{1}$$

$$\bar{x} = \frac{\sum x}{N} \Rightarrow 6 = \frac{3+5+6+x+9+2}{6}$$

$$\Rightarrow 36 = x + 25$$

$$\therefore x = 11$$