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# **Mean, Median and Mode**

Unit 3 Lesson 3

## Students will be able to:

Solve problem involving measures of central tendency.

## Key Vocabulary:

- Mean
- Median
- Mode
- Arithmetic Mean
- Weighted Mean

## MEASURES OF CENTRAL TENDENCY

A measure of central tendency is the typical or the most representative of set of numbers. The three measures of central tendency which are most commonly used are:

- mean (or average)
- median
- Mode

# MEAN, MEDIAN AND MODE

## Mean

Mean or average is the sum of all the scores divided by the number of scores. In symbols

$$\bar{x} = \frac{\sum x}{n}$$

## MEAN, MEDIAN AND MODE

**Example:** Find the average of the following set of scores 45, 53, 42, 51, 48, 46, 49, 45, and 47.

Solution:

Number of Observation: 9

$$\bar{x} = \frac{(45 + 53 + 42 + 51 + 48 + 46 + 49 + 45 + 47)}{9}$$

$$\bar{x} = \frac{426}{9}$$

$$\bar{x} = 47.33$$

## MEAN, MEDIAN AND MODE

### Sample Problem 1:

The prices of certain books are set at \$10, \$15, \$18, \$20 and \$24. Find the arithmetic mean of these five books.

Solution:

$$\bar{x} = \frac{\$(10 + 15 + 18 + 20 + 24)}{5}$$

$$\bar{x} = \frac{\$87}{5}$$

$$\bar{x} = \$17.40$$

## MEAN, MEDIAN AND MODE

### Weighted Arithmetic Mean

**Example:** Let us compute for the weighted arithmetic mean considering that 10,000 books were sold at \$10; 8,000 were sold at \$15; 5,000 were sold at \$18; 4,000 books were sold at \$20 and 2,000 were sold at \$24.

Solution:

$$\bar{x} = \frac{(10000 \times \$10) + (8000 \times \$15) + (5000 \times \$18) + (4000 \times \$20) + (2000 \times 24)}{29000}$$

$$\bar{x} = \frac{\$100,000 + \$120,000 + \$90,000 + \$80,000 + \$48,000}{29000}$$

$$\bar{x} = \frac{\$438,000}{29000}$$

$$\bar{x} = \$15.10$$

# MEAN, MEDIAN AND MODE

## Sample Problem 2:

Find the average grade of Missy if her report card is given below:

Subject	Units	Grade
English	3	87
Math	3	85
Science	3	87
Literature	2	88
History	2	89

Solution:

$$\bar{x} = \frac{(3 \times 87) + (3 \times 85) + (3 \times 87) + (2 \times 88) + (2 \times 89)}{13}$$

$$\bar{x} = \frac{261 + 255 + 261 + 176 + 178}{13}$$

$$\bar{x} = \frac{1131}{13}$$

$$\bar{x} = 87$$



### Median

**Median is defined as the middle number in a given set of numbers. This means that the median divides the distribution into two equal parts such as that half is above or greater than it, while the other half is below or less than its value.**

## MEAN, MEDIAN AND MODE

**Example:** Find the median of the following set of scores 45, 53, 42, 51, 48, 46, 49, 45, and 47.

Arrange from lowest to highest.

42, 45, 45, 46, 47, 48, 49, 51, 53

The median is 47.

If we add 55 in the distribution

42, 45, 45, 46, 47, 48, 49, 51, 53, 55

The median is  $\tilde{x} = \frac{47 + 48}{2} = 47.5$

## MEAN, MEDIAN AND MODE

### Sample Problem 3:

Find the median of the following sets of score 92, 91, 92, 91, 90, 83, 85, 86, 84, and 87

Solution:

83, 84, 85, 86, 87, 90, 91, 91, 92, 92

$$\tilde{x} = \frac{87 + 90}{2} = 88.5$$

# MEAN, MEDIAN AND MODE

## Mode

The mode is the number that occurs the most often in a set or the one with the highest frequency.

**Example:** Find the mode of the following set of scores 45, 53, 42, 51, 48, 46, 49, 45, and 47.  
42, 45, 45, 46, 47, 48, 49, 51, 53

If we observed the distribution 45 appears two times in the distribution which means that 45 is the mode.

## MEAN, MEDIAN AND MODE

### Sample Problem 4:

Find the mode of the following sets of score 92, 91, 92, 91, 90, 83, 85, 86, 84, and 87.

83, 84, 85, 86, 87, 90, 91, 91, 92, 92

91 and 92 appears twice in the distribution this means those modes are 91 and 92.