

## Chapter 5

### Section 5.1: Central Tendency

**Mode:** the number or numbers that occur **most often**.

**Median:** the number at the **midpoint** of a ranked data.

**Example 1:** The test scores for a test were: 78, 81, 82, 76, 84, 81, 76. Find the mode and the median.

The **mode** is 81 and 76, both of them repeated twice

The **median** must be found after the data is ranked from smallest to largest.

For the above data: 76, 76, 78, 81, 81, 82, 84 the median is 81 which is located in the middle.

**Example 2:** The test scores for a test were: 78, 81, 82, 76, 84, 86. Find the mode and the median.

There is no **mode**, no score is repeated more than once

The **median** must be found after the data is ranked from smallest to largest.

For the above data: 76, 78, 81, 82, 84, 86. There are two values in the middle 81 and 82, then the median is average of those two values or  $(81+82)/2= 81.5$

**Example 3:** The test scores for a test were: 78, 78, 78, 81, 81, 95, 95, 95, 100. Find the total.

As you noticed, there are repeated scores and it is easier to find the total of those scores this way:

$$\text{Total} = 3(78) + 2(81) + 3(95) + 1(100) = 781$$

$$\text{Or: total} = \sum f_i x_i$$

where:  $\sum$  is the symbol for sum

$x_i$  is the score;  $f_i$  is the frequency of each score

**Example 4:** Find the average score for the tests in example 3.

The average score is the total divided by the number of tests, there are 9 tests,

$$\text{The average is} = (781)/9 = 86.78$$

$$\text{Or: } \bar{x} = \frac{\sum f_i x_i}{n}$$

where  $n$  is number of tests,  $n = \sum f_i$  (sum of frequencies)