Name: _____ Date: _____

MEASURES OF CENTRAL TENDENCY
COMMON CORE ALGEBRA I

In our day to day activities, we deal with many problems that involve related items of numerical information called ***data***. ***Statistics*** is the study of sets of such numerical data. When we gather numerical data, besides displaying it, we often want to know a single number that is representative of the data as a whole. We call these types of numbers **measures of central tendency**. The two most common measures of central tendency are the **mean** and the **median**.

***Exercise* #1:** A survey was taken amongst 12 people on the number of passwords they currently have to remember. The results in ascending order are shown below. State the median number of passwords and the mean number of passwords (to the nearest tenth).

0, 1, 1, 1, 2, 2, 3, 3, 3, 3, 4, 6

***Exercise* #2:** Students in Mr. Okafor's algebra class were trying to determine if people speed along a certain section of roadway. They collected speeds of 20 vehicles, as displayed in the table below.

(a) Find the mean and median for this data set.

Speed (mph)	Number of Cars
29	1
33	2
34	4
35	5
36	3
38	2
39	2
54	1

(b) The speed limit along this part of the highway is 35 mph. Based on your results from part (a), is it a fair to make the conclusion that the average driver does speed on this roadway?

When conducting a statistical study, it is not always possible to obtain information about every person or situation to which the study applies. Unlike a **census**, in which **every person** is **counted**, some studies use only a **sample** or **portion** of the items being investigated. Whenever a sample is taken, it is vital that it be **fair**; in other words, the **sample reflects** the overall **population**.

***Exercise* #3:** To determine which television programs are the most popular in a large city, a poll is conducted by selecting a sample of people at random and interviewing them. Outside which of the following locations would the interviewer be most likely to find a fair sample? Explain your choice and why the others are inappropriate.

(1) A baseball stadium (3) A grocery store

(2) A concert hall (4) A comedy club

***Exercise* #4:** Truong is trying to determine the average height of high school male students. Because he is on the basketball team, he uses the heights of the 14 players on the team, which are given below in inches.

69, 70, 72, 72, 74, 74, 74, 75, 76, 76, 76, 77, 77, 82

(a) Calculate the mean and median for this data set. Round any non-integer answers to the nearest tenth.

(b) Is the data set above a **fair sample** to use to determine the average height of high school male students? Explain your answer.

Data sets can have members that are far away from all of the rest of the data set. These elements are called **outliers,** which can result in a mean that does not represent the true "average" of a data set.

***Exercise* #5:** In Mr. Petrovic's Advanced Calculus Course, eight students recently took a test. Their grades were as follows:

45, 78, 82, 85, 87, 89, 93, 95

(a) Calculate the mean and median of this data set. (b) What score is an **outlier** in this data set?

(c) Which value, the mean or the median, is a better measure of how well the average student did on Mr. Petrovic's quiz?

Name: _____ Date: _____

MEASURES OF CENTRAL TENDENCY
COMMON CORE ALGEBRA I HOMEWORK

1. The Student Government at Arlington High School decided to conduct a survey to determine where to go on a senior field trip. They asked students the following question: "Would you rather go to a sports event or to an IMAX movie?" At which of the following locations would they most likely get a fair sample?

   (1) The gym, after a game (3) A randomly chosen study hall

   (2) The auditorium after a play (4) At the Nature Club meeting.

2. For the following data set, calculate the mean and median. Any non-integer answers should be rounded to the nearest tenth.

   3, 5, 8, 8, 12, 16, 17, 20, 24

3. For the following data set, calculate the mean and median. Any non-integer answers should be rounded to the nearest tenth.

   5, 5, 9, 10, 13, 16, 18, 20, 22, 22

4. Which of the following is true about the data set {3, 5, 5, 7, 9}?

   (1) median > range (3) mean > median

   (2) median = mean (4) median > mean

6. Which of the following data sets has a median of 7.5?

   (1) {6, 7, 8, 9, 10} (3) {1, 3, 7, 10, 14}

   (2) {3, 5, 7, 8, 10, 14} (4) {2, 7, 9, 11, 14, 17}

7. A survey is taken by an insurance company to determine how many car accidents the average New York City resident has gotten into in the past 10 years. The company surveyed 20 people who are getting off a train at a subway station. The following table gives the results of the survey.

Number of Accidents	Number of People
0	6
1	8
2	4
3	1
11	1

(a) Calculate the mean and median number of accidents of this data set. Remember, there are 6-zeros in this data set, 8-1's, etc.

(b) Are there any outliers in this data set? If so, what data value?

(c) Which number, the mean or the median, better represents the number of accidents an average person in this survey had over this 10 year period? Explain your answer.

(d) Does this sample fairly represent the average number of accidents a typical New York City resident would get into over a 10 year period? Why or why not?

(e) Construct a dot plot that represents this data set on the axes below.

Is this a symmetric plot? Explain your thinking.