Section 10.1 and 10.2 Guided Notes Name: _____

**Algebra 1**

# Data Analysis

*Definitions:*

Survey - study of one or more characteristics of a group

Population - the entire group you want info about

Sample - a part of the population

Census - a survey of an entire population

Biased Sample - a sample not representative of the population

Biased Question - a question that encourages a particular response

*Examples:*

1. In each example, determine the population and the sample:

a) Your school wants to know if students are satisfied with the lunch menu. In each grade students with a last name beginning with M are surveyed.

Pop = all students @ 9th Sample = last name M

b) A toothpaste manufacturer is interested in customer opinions for a new flavor. A representative sets up a booth at the mall to give samples and get feedback.

Pop = people that are customers Sample = @ mall

2. In each example, determine if there is any bias. If so, explain how you could correct the situation to eliminate the bias.

a) A election committee asks, "Do you support the incumbent's plan or the challenger's plan?"

no bias

b) The first 25 students to enter a soccer field are asked, "What do you think about America's most interesting sport, soccer?"

bias ← pop question

what is the most interesting sport.

c) Every tenth person at the DMV is asked, "Is the minimum driving age too high or too slow?"

low

bias — sample

*Definitions:*

# Measures of Central Tendency

Mean - average

Median - # in middle (#'s in order)

Mode - most often

Range - highest - lowest

Outlier - a # that doesn't fit in the data

*For each data set below calculate the mean, median, mode, range and determine if there are any outliers.*

1. 420, 360, 398, 196, 398, 400

196, 360, 398, 398, 400, 420

mean = $\frac{2172}{6}$ = 362

median = 398

most = 398

range = 420 - 196 = 224

outlier = 196

2. 48, 23, 97, 36, 27, 72, 48, 41, 58, 48, 41

23, 27, 36, 41, 41, 48, 48, 48, 58, 72, 97

mean = $\frac{539}{11}$ = 49

median = 48

mode = 48

range = 97 - 23 = 74

outlier = 97?

3. 9.04, 8.88, 5.2, 9.52, 5.6, 12.44

5.2, 5.6, 8.88, 9.04, 9.52, 12.44

median $\frac{8.88 + 9.04}{2}$ = 8.96

Section 10.1 and 10.2 Homework Name: _____

**Algebra 1**

# Data Analysis

**In Exercises 1 and 2, identify the population and the sample. Then, tell whether the survey method used is likely to result in a biased sample.**

1. A bicycling club wants to gather information about biking conditions throughout a city. A survey for bicycle riders is posted on the club's website.

2. A management company that owns several apartment buildings wants to gather information about tenant satisfaction with the condition of the apartments. They send a survey to 30 random tenants in each of the buildings.

**In Exercises 3-5, explain why the question is biased. Then rewrite it so that it is not.**

3. Don't you agree that it is better to offer an accounting class as an elective rather than a computer programming class?

4. Wouldn't school be better if they opened up a Starbucks in the commons?

5. Would you pay even higher taxes to fund a new highway?

6. **Street Conditions** A television station does a report on the condition of the streets in a large city. Part of the report includes a survey of people that live in the area. The survey is done by asking people at a bus stop what they think of local street conditions. Is this sample necessarily representative of local residents? *Explain*.

*For each data set below calculate the mean, median, mode, range and determine if there are any outliers.*

7. 110, 114, 104, 108, 106

8. 15, 17, 15, 17, 21, 17, 15, 23

9. 50.8, 51.6, 51.9, 52, 52.5, 52.8, 53.1

10. **Hotel Stay** You are planning a trip to Washington, D.C. and are looking up hotel room rates. On the Internet, you find the following rates for a one-night stay in a hotel in Washington, D.C.

    $109, $126.50, $175.95, $139, $77.50, $145, $162.35, $173, $181.50, $105

    **a.** Find the mean, median, and mode(s) of the rates.

    **b.** Which measure of central tendency best represents the data? *Explain*.