# Math 45 – Quiz #2 Name Daniel & Russell

(Points for each problem in parentheses.)

1. (3 each) One of the items on the student survey for an introductory statistics course was “Rate your aptitude to succeed in this class on a scale of 1 to 10” where 1 = Lowest Aptitude and 10 = Highest Aptitude. The instructor examined the data for men and women separately. Below is the distribution of this variable for the 30 women in the class. How should the instructor interpret the women’s perceptions regarding their success in the class?

|  |  |
| --- | --- |
|  | a. Find the median rating for the women’s perception regarding their success in the class.  Answer: \_3\_\_\_\_\_  b. Find the mean rating for the women’s perception regarding their  success in the class.  Answer: \_\_3.8\_\_\_\_ |

1. (3) Describe the shape of the graph in question #1. The graph in question 1 skews right.

3. (3) State Farm Insurance Company collects various information on each of its policyholders. The data is used in many different ways. The actuarial department uses the data to calculate your car and homeowners insurance rates, while the marketing department uses the data to calculate different percents, means, and medians. Given the variables: Home Value, Zip Code, Age of House, and Square Footage of House, for which of those variables could you NOT calculate a mean or a median?

Answer: \_\_\_\_zip code\_\_\_\_\_\_\_\_\_\_\_\_

1. (3) The dotplot below shows the distribution of chest diameter measurements for 507 adults who attend a local gym. Estimate the median. Round your answer to one decimal place.



Answer: \_\_\_\_\_\_27.8\_\_\_\_\_\_\_\_\_\_

1. (3) If most of the measurements in a large data set are of approximately the same magnitude except for a few measurements that are quite a bit larger, which would be larger, the mean or the median? What shape would a histogram of the data set have?

The mean would be larger. It would be skewed to the right.

1. (3) In measuring the center of the data from a skewed distribution, briefly explain why the median would be preferred over the mean for most purposes.

The median is preferred because the tail of the skew will pull the mean value toward the higher (right) end of the scale, while the median is always the middle number. With skewed data, that can mean that the median is where the bulk of the data is, while the mean is further away.

1. (4 each) A sample of 100 distances has a mean of 24 feet and a median of 24.5 feet. Unfortunately, it has just been discovered that an observation which was erroneously recorded as “30” actually had a value of “50”. If we make this correction to the data, then:
2. The mean will probably increase, decrease, or stay the same? Why?

The mean will increase because the new value will increase the sum of the total observations, while the number of data points stays the same.

b. The median will probably increase, decrease, or stay the same? Why?

The median will stay the same because the value changed to 50 is still above the original determined median of 24.5 feet. The median will still have the same number of points above and below it.

1. (3) The dotplot shows the distribution of car speed (miles per hour) for 60 cars measured on Interstate Highway 1. What is the median car speed for the cars in this distribution?



Answer: \_\_\_\_\_\_\_68\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. (3) The distribution of the home prices (for single family homes excluding condos and town-homes) in San Francisco is strongly skewed to the right. In 2009, the two measures of center for the San Francisco home prices were $751,000 and $858,000. Which number represents the mean home price and which number represents the median home price? Why?

The number $858,000 would represent the mean, because when data skews right, it pulls the mean with it, causing it to be a higher value than the median.

1. (4) A college statistics class conducted a survey. They gathered data from a large random sample of students who estimated how much money they typically spent each week in different categories (e.g., food, entertainment, etc). A distribution of the survey results is presented below. One student claims the distribution of food costs basically looks bell-shaped, with one outlier. Do you agree or disagree? Explain briefly.



We disagree. The distribution skews to the right with an outlier.

1. (2) Use the graph in Question 10, to determine which interval contains the median amount of money students typically spent each week on food.

a). 10-20 b). 20-30 c). **30-40** d). 40-50 e). 50-60

1. (3) Use the graph in Question 10, to estimate the mean amount of money students typically spent each week on food. Show all work. I want to see what you used to calculate your answer or you will get 0 points.

Numerator: 15(5) + 80(15) + 60(25) + 45(35) + 45(45) + 55(55) + 10(75) + 5(135) = 10820

Denominator 15+80+60+45+45+55+10+5=315

Mean 10450/310=34.35

