Name Key Date _____ Period _____

Algebra 2: 11.1 - 11.5 Test Review

Fill in the Blank (#1-5): Use the word bank to the right to fill in the missing word.

1. Margin of Error is used to find a range of reasonable values of where statistics should fall around a parameter.
2. A(n) experiment involves applying a treatment to some group or groups and measuring the effects of the treatment.
3. A(n) Stat. Question can be answered by collecting many pieces of information, or data, and summarizing the data.
4. The z-score counts how many standard deviations a data value is from the mean.
5. A statistic is a measure that describes a sample of the population.

Word Bank
experiment
margin of error
sample
z-score
statistical question

6. Explain how to determine if a quantity is a statistic or a parameter.

Statistic: Measure from a SAMPLE

Parameter: Measure from a POPULATION

7. Identify the following as a *statistic* or *parameter* (based on your answer to **question 6**).
   a. The average length of all the trout in a river is 60 cm. Parameter
   b. The average monthly allowance of 50 selected 4th graders is $6.82. Statistic
   c. The average age of all Boston Marathon runners in 2017 was 42.75 years. Parameter

8. Ms. Tarp wants to know what kinds of things her students do to prepare for her tests. Ms. Tarp placed the names of her students into a box. To determine whom she would ask about their study habits she asked a student to draw names from the box.
   a. What is the sample in this situation?

The students whose names are drawn

   b. What is the population?

Ms. Tarp's students

9. For the following examples, identify the sampling method.
   a. "The first ten students who enter the school are sampled."

Convinience Sampling

   b. "Every 10th person in line was chosen to fill out a survey."

Systematic Sampling

10. For the sampling methods above, is each method biased? Explain why or why not.

convinience sampling is biased because you are only choosing the 1st 10 students.

11. Describe what kind of study you would conduct to answer each statistical question.
   a. "Is the lifespan of giraffes affected by the number of offspring they produce?"

Observation

   b. "Do employees at a company want vending machines with healthy snacks?"

Survey

1,2,4,5,7,8,8,9,10,11,12,14,15 35,38,41,45,46,48,52,56,59,70,79

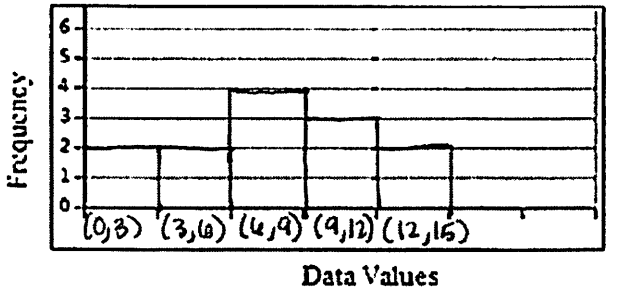
For 12&13, use the given data set to answer the questions below.

12. 12,2,14,4,1,6,11,7,8,5,9,10,8,15

Min	Q1	Median	Q3	Max
1	5	8	11	15

IQR: 6 Mean: 8

Draw a Histogram:



Best Measure of Center: Mean

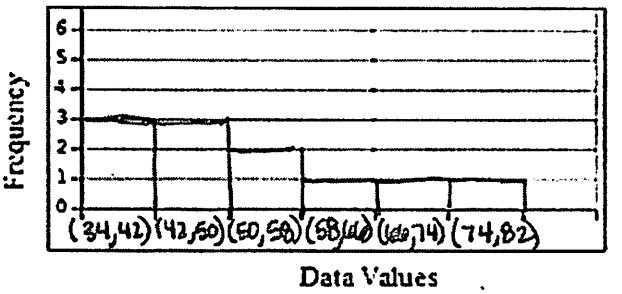
Best Measure of Spread: Std. Deviation

13. 45,56,38,48,41,35,59,46,52,79,70

Min	Q1	Median	Q3	Max
35	41	48	59	79

IQR: 18 Mean: 51.72

Draw a Histogram:

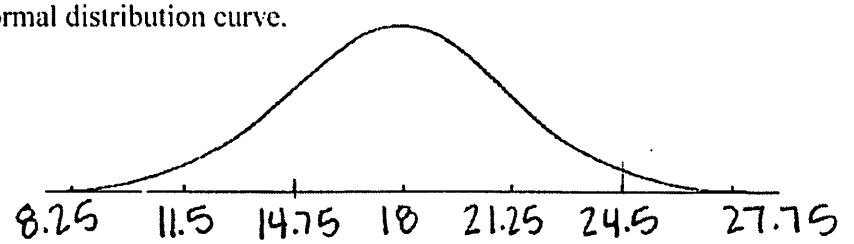


Best Measure of Center: Median

Best Measure of Spread: IQR

14. Suppose travel times of all employees at a company are normally distributed with mean travel time of 18 minutes and standard deviation of 3.25 minutes.

a. Label the normal distribution curve.



b. What percent of the employees have a travel time between 14.75 and 24.5 minutes?

$34\% + 34\% + 13.5\% = 81.5\%$

c. Kate is an employee with a travel time of 9.5 minutes. What is the z-score for Kate's travel time?

$z = \frac{9.5 - 18}{3.25} = -2.615$

d. Jim works with Kate and his z-score is 1.2. What is Jim's travel time?

$1.2 = \frac{\bar{x} - 18}{3.25}$ $3.25(1.2) + 18 = \bar{x}$ $\bar{x} = 21.9$ minutes

**The billing department boasts their mean travel time is only 15 minutes based on a sample of 20 employees in their department.

d. Calculate the margin of error for the billing department.

$MOE = \pm 2(3.25)/\sqrt{20} = 1.4534...$

e. Do you agree with the billing dept.'s claim? Use a range of reasonable means to support your answer.

Range of reasonable means: 18 ± 1.453 (16.457 to 19.453)

NO, it is outside the range of reasonable means.

15. All other things being equal, what happens to the margin of error when the sample size increases? Explain.

the MOE decreases when sample sizes increase