9C Deviation and Outliers Name _____Per: _____

SHOW YOUR WORK AND WORK IN PENCIL.

1. Use the points from the following table.

X	1	2	3	4	5	6
Y	10	13	7	22	28	19

   a. Find the mean ($\bar{x}$) _____

   b. Find the line of regression for the table.

   _____ What is the r-value? _____

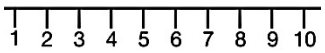
   c. What is the standard deviation? _____

   d. What does the standard deviation tell us about the spread of the data._____

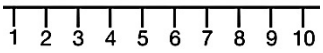
2. **Pull-Up Data:** A gym teacher at a middle school collected this data about the number of pull-ups by seventh graders in P.E. class: $2, 3, 4, 3, 2, 5, 5, 6, 6, 6, 9, 4, 10, 3, 2, 1, 9$. Find the following:

   a. Mean: _____
   b. Mode: _____
   c. Standard Deviation (σx): _____
   d. Min: _____
   e. Q1: _____
   f. Median: _____
   g. Q3: _____
   h. Max: _____
   i. Range: _____
   j. IQR (Inter-Quartile Range): _____

   k. Box Plot

   l. Dot Plot

   m. Histogram (0-3, 4-7, 8-11)

3. Given the data set $\{29, 19, 35, 27, 21, 23, 12, 24, 26, 20, 28, 30, 22, 19, 32, 22\}$ Find the following:

   a. Mean: _____
   b. Mode: _____
   c. Standard Deviation (σx): _____
   d. Min: _____
   e. Q1: _____
   f. Median: _____
   g. Q3: _____
   h. Max: _____
   i. Range: _____
   j. IQR (Inter-Quartile Range): _____

4. Mathematically show if there are any outlier with the data above (HINT: IQR*1.5)

   a. What is the maximum value a number can be and NOT be an outlier? _____

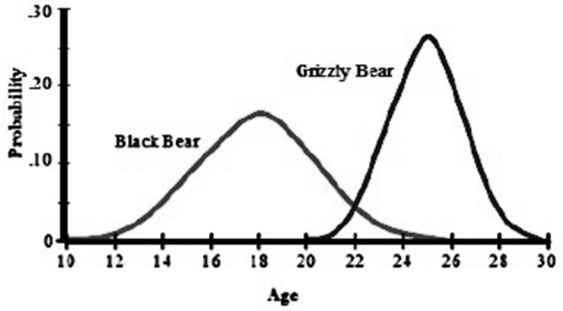
   b. What is the minimum value allowed without being an outlier? _____

5. Given the data set $\{12, 19, 20, 21, 22, 22, 23, 24, 24, 25, 26, 26\}$ Find the following:

   a. Mean: _____
   b. Standard Deviation (σx): _____
   c. Min: _____
   d. Q1: _____
   e. Median: _____
   f. Q3: _____
   g. Max: _____
   h. IQR: _____

   i. Mathematically prove if there is an outlier

6. Using the graphs to the right to answer the following



   a. Which graph has a smaller standard deviation?_____

   b. Which graph as a larger range of data?_____

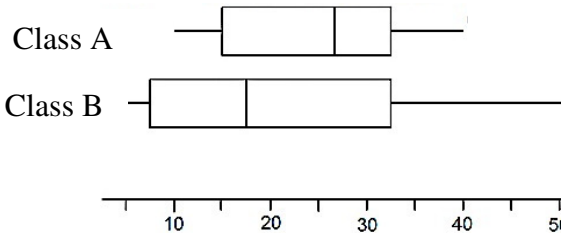
   c. What is the average age of a black bear?_____

   d. What is the mean and median of the grizzly bear? _____

   e. Are the two spreads equal? _____ Explain:_____

   f. Describe the difference in the method of escape if you were eating a ham sandwich and encountered the two types of bears. _____

7. Look at the following box plots of two class sets of data for a 50-point test. **EXPLAIN**



   a. Which class has a higher mean? _____

      Explain: _____

   b. Which has a higher median? _____

      Explain:_____

   c. Which has the higher maximum? _____ Explain: _____

   d. Which has the higher minimum? _____ Explain:_____

   e. What percent of the data is below Q3 for Class A? _____ Explain:_____

   f. What percent of the data is below Q3 for Class B? _____ Explain:_____

   g. Which has the larger IQR? _____ Explain:_____

   EC. Which has the highest standard deviation?

8. A biologist assumes that there is a linear relationship between the amount of fertilizer supplied to tomato plants and the yield of tomatoes. Eight tomato plants were selected at random and treated with a solution in which *x* grams of fertilizer was dissolved in water. The yield, y kilograms, of tomatoes was recorded.

Plant	A	B	C	D	E	F	G	H
X	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
Y	3.9	4.4	5.8	6.6	7.0	7.1	7.3	7.7

   a. Find the line of regression for the plant data. _____

   b. If a plant were given 5.5 grams of fertilizer, what would be the estimated yield of tomatoes? _____

   c. If a plant were given 15.5 grams of fertilizer, what would be the estimated yield of tomatoes? _____

   d. What is the *r* value of the data? _____

   e. What does the *r* value mean? _____