Name _____

3.3: Summary Statistics: Measures of Center

<u>Class Prep Assignment</u>   <u>Due at the beginning of next class</u>

We Describe Four Characteristics of Data: <u>Shape</u>, <u>Center and Spread</u>, and <u>Outliers</u>

Example. The grades on the third exam for a MTH 95 class were as follows:
        82 74 67 81 49 84 52 91 66 75 96 73 71 78 49 86 85 62 58

a) Make a histogram of the data to determine its shape.

Shape of the Histogram:

Unimodal   Bimodal   Multimodal

Symmetric   Skewed to the Left   Skewed to the Right
                              (Mean less than median)   (Mean greater than median)

Measures of Center or Average
        Mean:

        Median:
                odd number of values:
                even number of values:

        Mode:

b) Arrange the grades above in order:

c) Find the mean   d) Find the median

e) Find the mode(s), if any

Name _____

3.4: Summary Statistics: Measures of Variation

<u>Class Prep Assignment</u>   <u>Due at the beginning of next class</u>

Measures of Spread

      Range:

      Interquartile Range (IQR):

      Standard Deviation:

Five-Number Summary and Boxplot: Minimum, Q_1, Median, Q_3, Maximum

Continuing with the test scores in order, find the following:

      49, 49, 52, 58, 62, 66, 67, 71, 73, 74, 75, 78, 81, 82, 84, 85, 86, 91, 96

f) Five-number summary:

g) Range:

h) Interquartile Range (IQR):

i) Draw and label the boxplot:

Outliers

j) Are there any outliers in this data?

Which Measures to Use?
If the data is symmetric, use the mean and standard deviation
If the data is skewed, use the median and the IQR

Name _____

Standard Deviation

Standard Deviation The "average deviation from the mean." Can be approximated by the Range÷4 if the data is evenly spread without outliers.

$$s = \sqrt{\frac{\sum(x - mean)^2}{n-1}}$$

49, 49, 52, 58, 62, 66, 67, 71, 73, 74, 75, 78, 81, 82, 84, 85, 86, 91, 96

Data	Deviation from Mean	Squared Deviation
49		
49		
52		
58		
62		
66		
67		
71		
73		
74		
75		
78		
81		
82		
84		
85		
86		
91		
96		
Sum of the squared deviations:		

$$s = \sqrt{\frac{\sum(x - mean)^2}{n-1}} =$$

Standard Deviation Approximation: Range/4. How do they compare in this case?