Find the mean, median, mode, range, lower quartile, upper quartile, and inter-quartile range of each data set. Then draw a box-and-whisker plot for the data. Show your work.

1.) 6, 22, 4, 15, 14, 8, 8

Mean = 11

Median = 8

Mode= 8

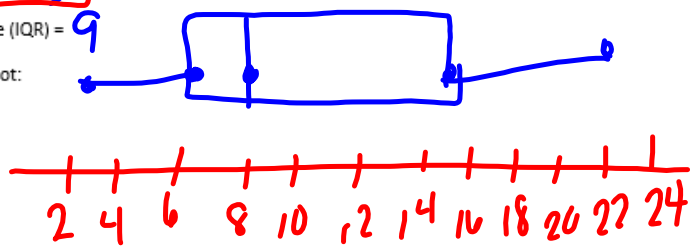
Range= 18

Q1 (lower quartile)= 6

Q3 (upper quartile)= 15

Interquartile Range (IQR) = 9

Box and whisker plot:



L1

Clear
Enter

2.) 10, 15, 12, 20, 25, 22, 29

Mean = 19

Median = 20

Mode= NONE

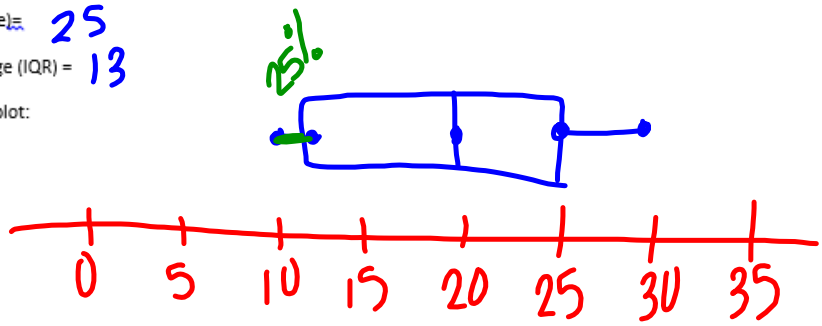
Range= 19

Q1 (lower quartile)= 12

Q3 (upper quartile)= 25

Interquartile Range (IQR) = 13

Box and whisker plot:



10
29

St. dev = 6.46

σx

σ

Range = max - min

$IQR = Q_3 - Q_1$

St. dev $= \sigma x$

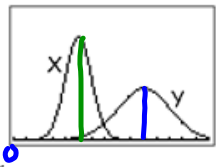
Variance = $(\text{St. dev.})^2$

Normal Distributions:

Compare Means and Standard deviations

For questions 1 and 2, use figure 1 to the right.

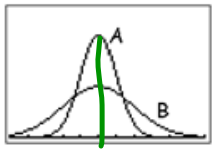
Figure 1



1. Which distribution has a larger mean? y
2. Which distribution has a larger standard deviation? y

For questions 3 and 4, use figure 2 to the right. Fill in the blanks with either >, <, or =

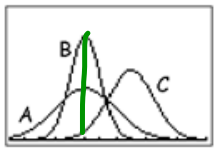
Figure 2



3. The mean of distribution A is = distribution B.
4. The standard deviation of distribution A is < distribution B.

For questions 5 – 10 use figure 3 to the right. Fill in the blanks with either >, <, or =

Figure 3



5. Which distribution has the largest mean? C
6. Which distribution has the largest standard deviation? A
7. Which distribution has the smallest standard deviation? B
8. The standard deviation of distribution B is < distribution C.
9. The mean of distribution A is = distribution B.
10. The standard deviation of distribution C is < distribution A.

orig $\bar{x}=5$

For questions 11 – 13, fill in each blank with either: increase, decrease, or stay the same

11. There are five children in a group with ages six, three, five, four, and seven. If a five year old enters the group, the mean age of the group will stay same and the standard deviation of the group's ages will decrease.

12. The same five children from #11 sit down at a lunch table. If a 3 year old sits down with them, the mean age of the table will decrease and the standard deviation of the table's ages will increase.

13. The original five children from #11 and #12 allow a seven year old to enter their play group. When this child enters, the mean age of the group will increase and the standard deviation of the group's ages will increase.

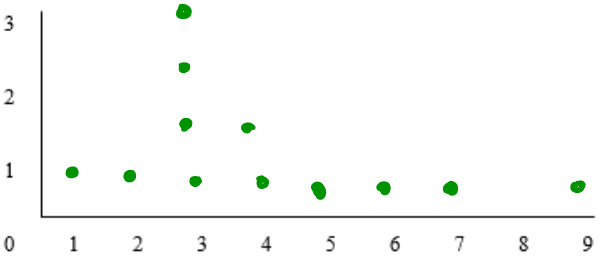
Below are two distributions of test scores. Use these test scores to answer the problems below.

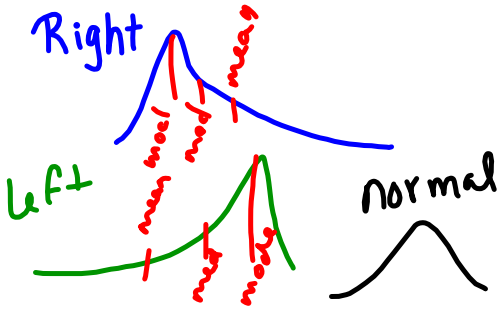
Scores for Test X : 2, 4, 2, 5, 6, 3, 9, 9, 9, 7, 8, 3,

Scores for Test Y : 3, 5, 3, 6, 2, 3, 4, 7, 3, 1, 9, 4

1) What is the **mean, median, and mode** for test Scores in distribution Y ? $\bar{x} = 4.6$ med : 3.5 mode = 3

2) Draw a dot plot for the test scores in distribution **Y**. Label the mean median and mode





3) Taking the **measures of central tendency** into account, describe the nature of the distribution of scores in distribution Y (hint: right skew, left skew, normal).

4) What is the **interquartile range** for test scores in distribution Y ? 2.5

5) If the **standard deviation** for test score distribution Y equals 1.6, and assuming a normal distribution of scores, between which two scores would you expect to find 68% of the scores ? Skip

Vocabulary:

1. Population: the entire group of people or objects you want information about.
2. Sample: a subset or a part of the population.
3. Sampling: involves studying a part of a group in order to gain information about the whole.
4. Census: attempts to contact every individual in the entire population.
5. Biased sample: a sample that over or under represents part of the population.
6. Unbiased sample: a sample that is representative of the population you want information about.

Types of Sample:
Define each of the following types of example and give an example:

1. Self Selected or Voluntary Response: members choose themselves by responding to a general appeal

   - Survey @ bottom of rec.

2. Convenience: chooses individuals that are easiest to reach

   - Student survey people @ sch.

3. Simple Random: each member of the population has an equal chance of being selected

   - each name in a hat; pick 1 name

4. Stratified Random: divide the population into groups of similar individuals (strata), then use a simple random sample method to obtain sample; combine all groups for full sample.

   - Sep. by gender; then pick from hat.

5. Cluster: entire population is divided into groups, or clusters, and a random sample of these clusters are selected. All observations in the selected clusters are included in the sample.

   - Survey 1200 hallway Student.

6. Systematic: relies on arranging the target population according to some ordering scheme and then selecting elements at regular intervals through that ordered list. Systematic sampling involves a random start and then proceeds with the selection of every *k*th element from then onwards.

   - every 8th person wins a puppy