

Name _____

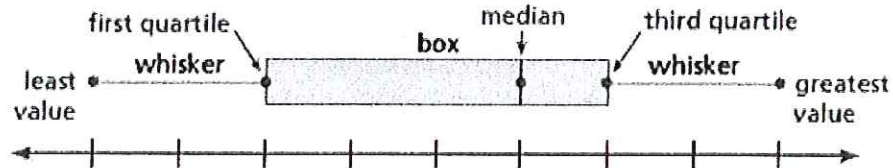
Algebra 2E

Box-and-Whisker Plots

Box-and-Whisker Plot: shows the variability of a data set along a number line using the least value, the greatest value, and the quartiles of the data.

Quartiles: divide the data set into four equal parts. The median (second quartile, Q2) divides the data set into two halves. The median of the lower half is the first quartile, Q1. The median of the upper half is the third quartile, Q3.

Five-number summary: the five numbers that make up a box-and-whisker plot.



Example 1: Make a box and whisker plot that represents the ages of the members of a backpacking expedition in the mountains.

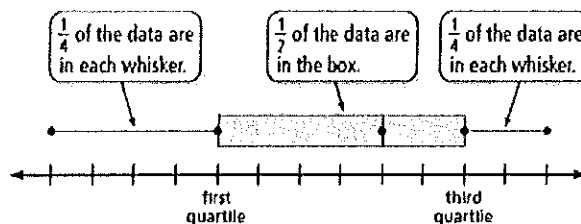
24, 30, 30, 22, 25, 22, 18, 25, 28, 30, 25, 27

Example 2: A basketball player scores 14, 16, 20, 5, 22, 30, 16, and 28 points during a tournament. Make a box-and-whisker plot that represents the data.

How to check the data set for outliers: $1.5(IQR)$
 then add to Q3
 subtract from Q1

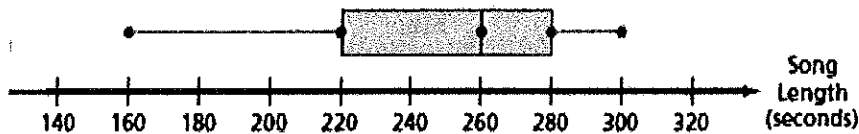
Are there outliers in Ex 1 or 2?

The figure shows how data are distributed in a box-and-whisker plot.



Another measure of variation for a data set is the **interquartile range (IQR)**, which is the difference of the third quartile, Q3, and the first quartile, Q1. It represents the range of the middle half of the data.

Example 3: The box-and-whisker plot represents the lengths (in seconds) of the songs played by a rock band at a concert.



- Find and interpret the range of the data.
- Describe the distribution of the data.
- Find and interpret the interquartile range of the data.
- Are the data more spread out below Q1 or above Q3? Explain.

e) any outliers? which?

Shapes of Box-and-Whisker Plots:



Skewed left

- Left whisker longer than right whisker
- Most data on the right



Symmetric

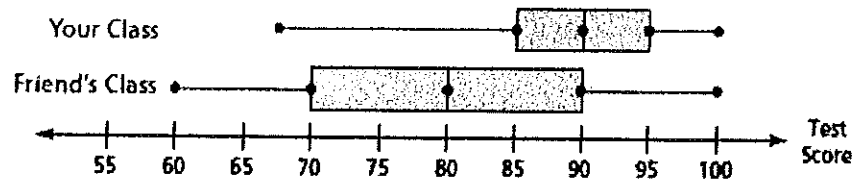
- Whiskers about same length
- Median in the middle of the data



Skewed right

- Right whisker longer than left whisker
- Most data on the left

Example 4: The double box-and-whisker plot represents the scores for your class and your friend's class.



a. Identify the shape of each distribution.

b. Which test scores are more spread out? Explain.

c) outliers in your class?

d) outliers in your friend's class?

Student Name: _____

Score: _____

Box – Whisker Plot - Medium

Problem 1:

Draw box and whisker for the given data:

23, 10, 13, 30, 26, 8, 25, 18

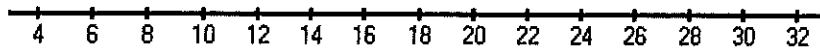
Work Space:

First Quartile =

Second Quartile or Median =

Third Quartile =

Range =



Problem 2:

Draw box and whisker for the given data:

35, 60, 20, 80, 95, 15, 40, 85, 75

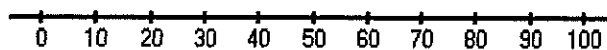
Work Space:

First Quartile =

Second Quartile or Median =

Third Quartile =

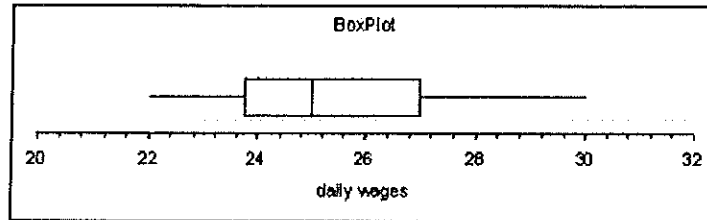
Range =



Name _____
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~~10/2~~ Box-and-Whisker Plot Homework

1. Use the box-and-whisker plot to find the given measure.



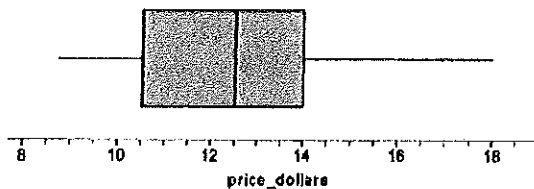
- | | |
|--------------------|--------------------|
| a. Least value: | b. Greatest value: |
| c. Third quartile: | d. First quartile: |
| e. Median: | f. Range: |

2. Make a box-and-whisker plot that represents each data set below.

a. Hours of television watched: 0, 3, 4, 5, 2, 4, 6, 5

b. MP3 player prices (in dollars): 124, 95, 105, 110, 95, 124, 300, 190, 114

3. The box-and-whisker plot represents the prices (in dollars) of the entrees at a restaurant.



a. Find and interpret the range of the data.

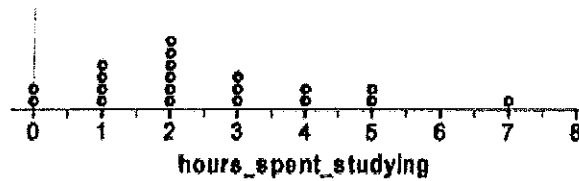
b. Describe the distribution of the data.

c. Find and interpret the interquartile range of the data.

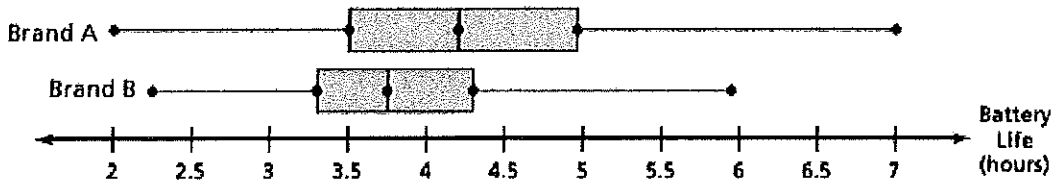
d. Are the data more spread out below Q1 or above Q3?

e) outliers?

4. The dot plot represents the numbers of hours students spent studying for an exam. Make a box-and-whisker plot that represents the data.



5. The double box-and-whisker plot represents the battery lives (in hours) of two brands of cell phones.



a. Identify the shape of each distribution.

b. What is the range of the upper 75% of each brand?

c. Compare the interquartile ranges of the two data sets.

d. You need a cell phone that has a battery life of more than 3.5 hours most of the time. Which brand should you buy?