

Math 206 - Quiz 6

October 13, 2010

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (3 points) The following data sets give waiting times in minutes of 11 customers at bus terminals in Atlanta and Boston.

Atlanta: ~~5.5, 6.0, 4.5, 5.0, 7.0, 6.5, 5.0, 7.5, 5.5, 4.0, 8.0~~

Boston: ~~5.5, 8.0, 2.0, 5.0, 8.5, 12.0, 1.5, 6.5, 9.5, 10.0, 6.0~~

For each data set, find the median, quartiles, IQR, and outlier cut-offs. Then carefully sketch the boxplots and compare the data sets.

ATLANTA :

4.0, 4.5, 5.0, 5.0, 5.5, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0

$$\text{MEDIAN} = 5.5, \quad Q_1 = 5.0, \quad Q_3 = 7.0$$

$$\text{IQR} = 2.0$$

$$1.5 \times \text{IQR} = 3.0$$

OUTLIER CUTOFFS ...

$$Q_1 - 1.5 \times \text{IQR} = 5.0 - 3.0 = 2.0 \quad \leftarrow \text{NO DATA BELOW } 2.0$$

$$Q_3 + 1.5 \times \text{IQR} = 7.0 + 3.0 = 10.0 \quad \leftarrow \text{NO DATA ABOVE } 10.0$$

BOSTON :

1.5, 2.0, 5.0, 5.5, 6.0, 6.5, 8.0, 8.5, 9.5, 10.0, 12.0

$$\text{MEDIAN} = 6.5, \quad Q_1 = 5.0, \quad Q_3 = 9.5$$

$$\text{IQR} = 4.5, \quad 1.5 \times \text{IQR} = 6.75$$

OUTLIER CUTOFFS ...

$$Q_1 - 1.5 \times \text{IQR} = 5.0 - 6.75 = -1.75 \quad \leftarrow \text{NO DATA BELOW } -1.75$$

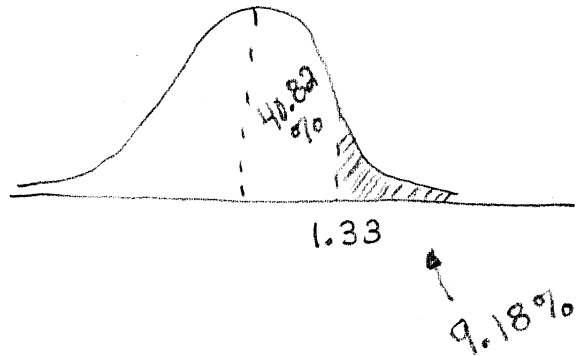
$$Q_3 + 1.5 \times \text{IQR} = 9.5 + 6.75 = 16.25 \quad \leftarrow \text{NO DATA ABOVE } 16.25$$

SEE ATTACHED
SHEET FOR
BOX PLOTS
AND
COMPARISON.

2. (1 point) The weights of certain candy bars are normally distributed with mean 4 oz and standard deviation 0.15 oz. In a sample of 1500 candy bars, about how many are heavier than 4.2 oz?

Z-score For 4.2

$$= \frac{4.2 - 4}{0.15} \approx 1.33$$



Look up 1.33 →

0.4082

9.18% of 1500

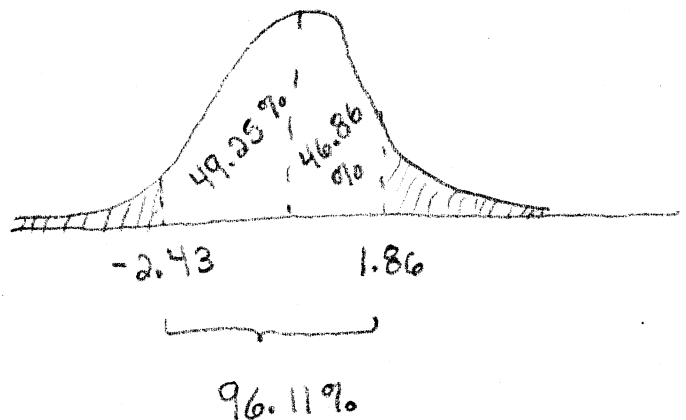
$$= 137.7$$

≈ 138 BARS

3. (1 point) The weights of legal U.S. quarters are normally distributed with mean 5.67 g and standard deviation 0.07 g. If a vending machine is adjusted to reject quarters weighing more than 5.8 g and less than 5.5 g, about what percent of legal quarters will be rejected?

Z-score For 5.5

$$= \frac{5.5 - 5.67}{0.07} \approx -2.43$$



Z-score For 5.8

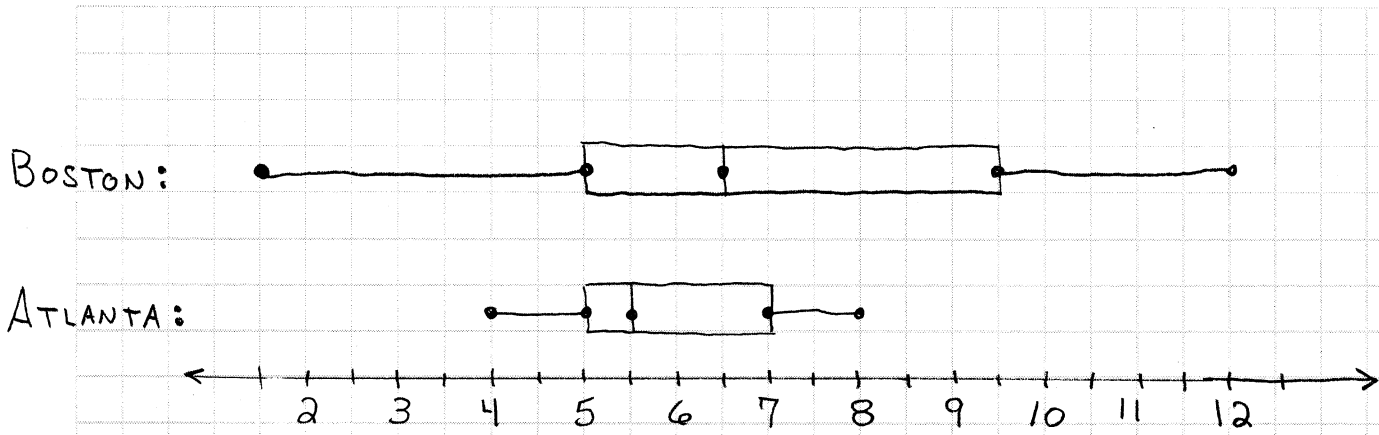
$$= \frac{5.8 - 5.67}{0.07} \approx 1.86$$

Look up 2.43 → 0.4925

$$100\% - 96.11\% = 3.89\%$$

Look up 1.86 → 0.4686

Quiz #6 Problem 1



THERE IS FAR LESS VARIATION IN THE ATLANTA DATA. ATLANTA IS MORE CONSISTENT. IT IS RARE FOR ATLANTA CUSTOMERS TO WAIT MORE THAN 7 MINUTES, BUT MUCH MORE COMMON FOR BOSTON CUSTOMERS.