

2.3: Measures of Variation

- *Mean, Median, Mode
- *Weighted Mean
- *Mean of a Frequency Distribution
- *Describing the Shape of a Distribution
- *Determining an Outlier (beyond 2 std. dev. of the mean)

2.4: Measures of Variation

- *Finding and Interpreting Standard Deviation
- *Using the Empirical Rule
- *Using Chebychev's Theorem

2.5: Measures of Position

- *Finding the 5-number summary
- *Creating a Box and Whisker plot
- *Determining an Outlier (beyond 1.5(IQR) from Q_1 and Q_3)
- *Interpreting Fractiles
- *Finding and explaining a Z-Score
- *Comparing Z-Scores

Use the data below to answer questions 1 – 6.

Total Philanthropic Givings in Lifetime:

Donors	Givings (millions of dollars)
Bill and Melinda Gates	27,976
Warren Buffet	2730
George Soros	5171
Michael and Susan Dell	1230
Walton Family	1000
Ted Turner	1200

1. Find the mean of the data set to the nearest whole number.

2. Find the median of the data set.

3. Find the mode of the data set.

4. Is the mean, median or mode a better measure of central tendency? Explain.

5. Find the population standard deviation. Round to the nearest whole number.

6. Use the mean/SD definition of outlier to show that 27,976 is an outlier.

7. A college professor gives 3 exams throughout the semester. The first exam is worth 20% of the grade, the second worth 30% and the third test worth 50% of the grade. Calculate a student's grade if their test scores were 85, 90, and 75. Use the right for your table.

Use the data below to answer questions 8 -11.

Number of Car Thefts in 12 US Cities in 2003

City	Number of Car Thefts
Phoenix-Mesa, AZ	40,769
Washington, DC	33,956
Miami, FI	21,088
Atlanta, GA	29,920
Chicago, IL	42,082
Kansas City, KS	11,669
Baltimore, MD	13,435
Detroit, MI	40,197
St. Louis, MO	18,215
Las Vegas, NV	18,103
Newark, NJ	14,413
Dallas, TX	26,343

8. Find the 5-number summary of the data.
9. Sketch a box and whisker plot of the data to the right of the table.
10. Find the IQR of the data set.
11. Use the IQR definition of outlier to show that none of the values are outliers.

12. The data below shows a sample of computers sold at one branch of “Buy More” stores. Calculate the mean number of computers sold at that branch.

Computers Sold	Frequency
4 to 9	2
10 to 15	4
16 to 21	10
22 to 27	6
28 to 33	3

13. 5000 people entering a mall to Christmas shop were surveyed and found to have ages with a mean of 40 years and a standard deviation of 12 years. Use this to answer (a) and (b).

- a) Using the Empirical Rule, approximately what percent of people were between the ages of 16 and 52?
- b) Using the Empirical Rule, approximately what percent of people were less than 28 years old?
- c) Using the Empirical Rule, approximately what percent of people were between 52 and 76?
- d). Using Chebychev’s theorem, approximately what percent of people were between the ages of 16 and 64?

14. IQ scores usually have a mean of 100 with a standard deviation of 15. Albert Einstein reportedly had an IQ of 160.

- a) Convert Einstein’s IQ to a z-score.
- b) Is Einstein’s IQ usual or unusual? Explain.
- c) What would an unusual IQ score be?