Statistics Homework Packet

Date: _____

Name: _____

Unit 1, Topic 3: How Do We Measure Data?

Part 1: Measures of Central Tendency

1. The following data represent salaries (in dollars) from a school district in Greenwood, South Carolina.

10,000	11,000	11,000	12,500	14,300	17,500
18,000	16,600	19,200	21,560	16,400	107,000

a) First assume you work for the school board in Greenwood and do not wish to raise taxes to increase salaries. Compute the mean, median, and mode, and decide which one would best support your position to not raise salaries.

- b) Second, assume you work for the teachers' union and want a raise for the teachers. Use the best measure of central tendency to support your position.
- c) Explain how outliers can be used to support one or the other position.
- d) If the salaries represented every teacher in the school district, would the averages be parameters or statistics?
- e) Which measure of central tendency can be misleading when a data set contains outliers?
- f) When you are comparing the measures of central tendency, does the distribution display any skewness? Explain.

2. For 108 randomly selected college students, this exam score frequency distribution was obtained. Find the mean of the grouped frequency distribution.

Class Limits	Frequency			
90-98	6			
99-107	22			
108-116	43			
117-125	28			
126-134	9			

3. An instructor grades exams, 20%; term paper, 30%; final exam, 50%. A student had grades of 83, 72, and 90, respectively, for exams, term paper, and final exam. Find the student's final average. Use the weighted mean.

Part 2: Measures of Variation

1. The costs per load (in cents) of 35 laundry detergents tested by a consumer organization are shown here. Find the variance and standard deviation.

Class limits	Frequency
13-19	2
20-26	7
27-33	12
34-40	5

2. Americans spend an average of 3 hours per day online. If the standard deviation is 32 minutes, find the range in which at least 88.89% of the data will lie. Use Chebyshev's theorem.

- 3. The average full-time faculty member in a post-secondary degree-granting institution works an average of 53 hours per week.
 - a. If we assume the standard deviation is 2.8 hours, what percentage of faculty members work more than 58.6 hours a week?
 - b. If we assume a bell-shaped distribution, what percentage of faculty members work more than 58.6 hours a week?

Part 3: Measures of Position

- 1. A final exam for a psych course has a mean of 84 and a standard deviation of 4. Find the corresponding *z* score for each raw score.
 - a. 87
 - b. 79
 - c. 93
- A student scores 60 on a math test that has a mean of 54 and a standard deviation of 3, and she scores 80 on a history test with a mean of 75 and a standard deviation of 2. On which test did she perform better?

Find the percentile rank for each test score in the data set. What value corresponds to the 60th percentile?
12, 28, 35, 42, 47, 49, 50

 Check the data for outliers: 24, 32, 54, 31, 16, 18, 19, 14, 17, 20

Part 4: Exploratory Analysis

Find the five-number summaries and construct box plots for the following sets of data.

1. 8, 12, 32, 6, 27, 19, 54

2. 362, 589, 437, 316, 192, 188