

Name: _____

Directions: This exam contains seven problems worth a total of 100 points. For each computational problem, you must first write the formula to be used and present all your subsequent work in order to receive full or partial credit. Circle your final answers.

1. Adam sold his pickup truck for \$3,500. For trucks similar to his, the mean trading price in the market is estimated to be \$3,200 with a standard deviation of \$500. Bob sold his antique car for \$12,000. For cars like Bob's, the estimated market trading price is \$10,000 with a standard deviation of \$2,200. Relatively speaking, which person got the better deal? Justify your answer mathematically. (10 pts.)

2. For this problem, no computation is necessary. Consider the following sets of data.

$$U: \{1, 2, 3, 4, 5\} \quad V: \{1, 1, 3, 5, 5\} \quad W: \{2, 3, c, 5, 6\}$$

- (a) Comparing U and V , which data set has the larger variance? (6 pts.)

- (b) Find the value of c , in W , so that U and W have the same variance. (6 pts.)

3. Briefly, but clearly, describe an example of a study in which there is a potential measurement bias. (6 pts.)

4. Below are descriptions of four numerical data sets. For each, determine whether the data are of the discrete or continuous type. (4 pts. ea.)

(a) Shoe sizes (in U.S. measure) for 20 men _____

(b) Relative humidities (in percent) for four cities _____

(c) Numbers of tornadoes touched down for 10 years _____

(d) Weights (in ounces) of seven newborn babies _____

5. An elementary-school teacher observed a strong positive association between the numbers of books students have read over summer and the scores on a reading comprehension test in the fall. The teacher concluded, "The best way to enrich students' reading comprehension is to encourage them to read many books." Do you agree with this conclusion? If no, explain why in a short sentence or two. (6 pts.)

6. Featured below are numbers of credits earned by a sample of six Freshman students in their first semester in college.

$$X: \{15, 12, 16, 17, 9, 16\}$$

(a) Compute the (i) sample median, (ii) sample mean, and (iii) sample standard deviation. Show your work. (20 pts.)

(b) What do the relative locations of the mean and median, from (a), tell you about the skewness of the distribution of this data set? (6 pts.)

7. Consider the following data.

$$Y : \{3.0, 3.1, 3.1, 3.2, 3.2, 3.2, 3.2, 3.3, 3.3, 3.4, 3.5, 3.8\}$$

- (a) Construct a stem-and-leaf display. Use a stem width of 1 and repeat each stem digit five times. (10 pts.)
- (b) Construct a dot plot. (8 pts.)
- (c) Based on (a) and (b) above, how would you describe the skewness of the distribution of the data? (6 pts.)