

Variability: Please use **red** for your answers

1. Imagine that you had a data set from a sample, and you wished to provide a descriptive measure of variability. Which measure would you use? _____

2. What three descriptive methods would you need to fully describe a set of data?

1. _____ 2. _____ 3. _____

3. If a professor returned an exam to you and your exam only had a deviation score of -15, what would you know about your X-score (your exam score)?

4. If a professor returned an exam to you and your exam had a deviation score of 8, and the professor told you that the class mean was 70, you would know that your exam score was:

Answer: _____

5. Make up 3 sets of data, each of which has 6 scores so that one set has very high variability, one has very low, and one has zero variability:

High variability _____

Low variability _____

Zero variability _____

6. You know that the standard deviation for a set of exam scores is 3.5. What does the measure of standard deviation tell you about the entire set of exam scores in relation to the mean?

7. What is the statistical notation for the following?

Population variance: _____

Population standard deviation: _____

Sample standard deviation: _____

Sum of the squared deviations: _____

8. Calculate SS (by hand, but you do not need to show your work) for the following set of population data:

Data set: 10, 4, 8, 5, 8

Answer: _____

9. Calculate the population variance (by hand, no need to show work) for the data set in question #8

Answer: _____

10. Calculate the population standard deviation for the data set in question #8

Answer: _____

11. A population has a mean of 100 and a variance of 4. What is its standard deviation?

Answer: _____

12. A sample has a standard deviation of 7. What is its variance?

Answer: _____

13. Calculate SS (by hand, no need to show work) for the following set of sample data: 1, 6, 10, 9, 4

Answer: _____

14. Calculate the sample standard deviation for the data set in question 13.

Answer: _____

15. What is the variance for the sample data in question 13?

Answer: _____

16. If a sample has a standard deviation of 3.2, what is its variance?

Answer: _____

17. If a sample has a variance of 2.2, what is its standard deviation

Answer: _____

18. A study examines the relationship between hours of sleep and the level of relaxation one feels in the afternoon in a SAMPLE of women. One group was allowed to sleep between 5 and 6 hours and the other group was allowed to sleep between 7 and 8 hours.

Here are the data for both groups:

5-6 hours of sleep

7-8 hours of sleep

4, 1, 5, 10, 5, 10

3, 2, 9, 15, 1, 12

Calculate the following by hand:

Calculate the mean for the 5-6 hour group. Answer _____

Calculate the mean for the 7-8 hour group. Answer: _____

Calculate the standard deviation for the 5-6 hour group. Answer: _____

Calculate the standard deviation for the 7-8 hour group. Answer: _____

What can you say about the differences/similarities in the descriptive statistics between the groups?

19.	<u>Females</u>	<u>Males</u>
	9	8
	9	10
	10	11
	13	12
	8	6
	9	10
	11	14

Above are **SAMPLE** data for standardized intelligence scores for men and women.

What is the mean for women? _____

What is the mean for men? _____

What is the standard deviation for women? _____

What is the standard deviation for men? _____

20. The following **POPULATION** data represent memory scores obtained for two groups of women, one older and one younger.

<u>Younger</u>	<u>Older</u>
8	7
6	5
6	8
7	5
8	7
7	8
8	8
8	5

Calculate the sample mean for younger women _____

Calculate the sample mean for older women _____

Calculate the standard deviation for younger women _____

Calculate the standard deviation for older women _____

TRUE / FALSE

_____ 21. The range and the standard deviation are both measures of distance.

_____ 22. If the highest score in a distribution is $X = 16$ and the lowest is $X = 4$, then the range is 12 or 13 points.

_____ 23. The range is usually considered to be a relatively crude measure of variability.

_____ 24. For a population of scores, the sum of the deviation scores is equal to N .

_____ 25. For a population, a deviation score is computed as $X - \mu$

_____ 26. A positive deviation always indicates a score that is less than the mean.

_____ 27. For a population of $N = 4$ scores with $\Sigma X = 1$ and $\Sigma X^2 = 30$, $SS = 5$.

_____ 28. To calculate the variance for a population, SS is divided by N .

_____ 29. A population with $SS = 90$ and a variance of 9 has $N = 10$ scores.

_____ 30. If the population variance is 5, then the population standard deviation is $\sigma = 25$.

- _____ 31. If the population variance is 4, then the standard deviation will be $\sigma = 16$.
- _____ 32. If the scores in a population range from a low of $X = 5$ to a high of $X = 14$, then the population standard deviation must be less than 10 points.
- _____ 33. A sample of $n = 6$ scores has $SS = 30$ and $s^2 = 6$. If the 6 scores were a population, the value of SS would still be 30, but the variance would be $\sigma^2 = 5$.
- _____ 34. A sample with a variance of 25 has a standard deviation equal to 5 points.
- _____ 35. To calculate the variance for a sample, SS is divided by $n - 1$.