Econ 103 – Quiz 1

Name: _____

Instructions: This is closed-book, closed-notes quiz. Please write your answers in the blanks provided. Each question is worth one point but no partial credit will be awarded. Non-programmable calculators are permitted.

1. To find out if smoking causes lower grades, Sara asks 100 of her friends if they smoke and what their current GPA is. Has Sara collected observational or experimental data?

   1. **Observational**

2. Assume we collect data on handspan in centimeters of students in ECON 103. What units does the *median* of handspan have?

   2. **centimeters**

3. Assume we collect data on handspan in centimeters of students in ECON 103. What units does the *variance* of handspan have?

   3. **centimeters squared**

4. What is the expression $\sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2}$ the definition of?

   4. **Standard deviation**

5. Write down the formula for the sample mean, in terms of individual observations, $x_1, x_2 \ldots x_n$

   5. $\frac{1}{n}\sum_{i=1}^{n} x_i$ **or** $\frac{1}{n}(x_1 + x_2 + ... + x_n)$

6. I have a dataset in which, strangely enough, every observation equals 7. What is the interquartile range of this dataset?

   6. **0**

7. I have a dataset for which the mean is 3. If I add 1 to each number in the dataset, what is the new mean?

   7. **4**

8. I have a dataset for which the standard deviation is 3. If I add 1 to each number in the dataset, what is the new standard deviation?

   8. **3**

9. The sample mean is a measure of what?
   A. Symmetry B. Spread **C. Central Tendency**

   9. _____

10. The variance is a measure of what?
    A. Symmetry **B. Spread** C. Central Tendency

    10. _____

11. Skewness is a measure of what?
    A. Symmetry B. Spread C. Central Tendency

    11. _____

12. What is the result of the following sequence of R commands? (Hint: R will print a single word (a logical statement) after the fourth line - write down this word)

12. **TRUE**

```
x <- 5
y <- 7
z = x + y
z + 3 == 15
```

13. Indicate whether this variable is nominal, ordinal or numerical: Ratings of movies (very poor, poor, average, good, very good)

13. **ordinal**

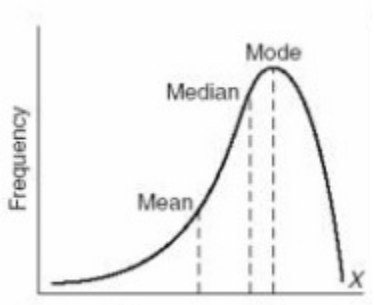
14. Indicate whether this variable is nominal, ordinal or numerical: Means of transportation (walking, bus, train, car)

14. **nominal**

15. Indicate whether this variable is nominal, ordinal or numerical: Monthly income (in US dollars)

15. **numerical**

16. Is the skewness of this distribution positive, negative or zero?



16. **negative**

17. What is the sample mean and variance of the z-scores $z_1, z_2, \ldots, z_n$?

17. **0, 1**

18. In the following diagram, events A, B, C, D and E are mutually exclusive and collectively exhaustive. True or false?

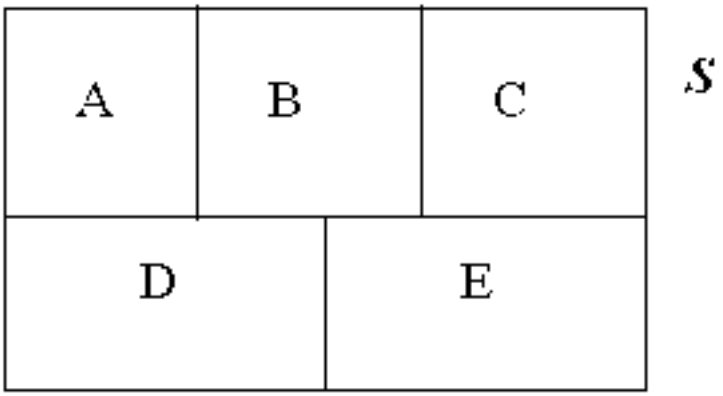
18. **True**

19. Out of a sample of 300 students, the undergraduate group in economics needs to chose three students for a committee: one president, one vice-president and one treasurer. Write down an expression for the total possible number of different committees (you do not have to actually calculate the probability).

19. $P_3^{300} = \frac{300!}{(300-3)!}$

20. Two six sided fair dice (with numbers 1 to 6) are rolled. What is the probability **in fraction** that their sum is (strictly) greater 9?

20. $\frac{6}{36} = \frac{1}{6}$


A
B
C
D
E
S