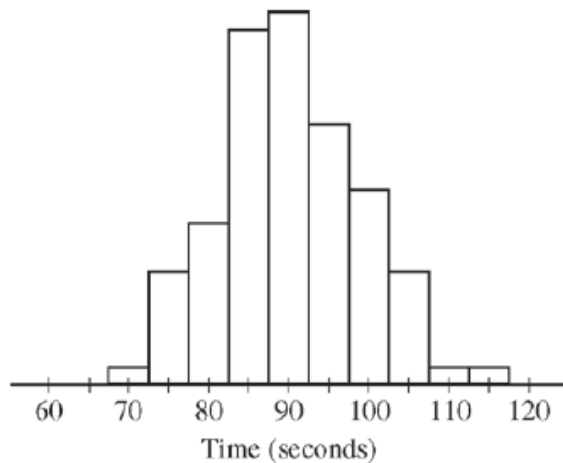


Name: \_\_\_\_\_

The amount of time required for each of 100 mice to navigate through a maze was recorded. The histogram below shows the distribution of times, in seconds, for the 100 mice.



Which of the following values is closest to the standard deviation of the 100 times?

- (A) 2.5 seconds
- (B) 10 seconds
- (C) 20 seconds
- (D) 50 seconds
- (E) 90 seconds

A graph (not shown) of the selling prices of homes in a certain city for the month of April reveals that the distribution is skewed to the left. Which of the following statements is the most reasonable conclusion about the selling prices based on the graph?

- (A) The mean is greater than the median.
- (B) The median is the average of the first quartile and the third quartile.
- (C) There are fewer selling prices between the first quartile and the median than there are between the median and the third quartile.
- (D) There are more selling prices that are less than the mean than selling prices that are greater than the mean.
- (E) The value of maximum minus third quartile is less than the value of first quartile minus minimum.

A survey was conducted in which both men and women were asked a question about a current issue. Possible responses to this question were “in favor of,” “not in favor of,” or “no opinion.” A chi-square test is to be used to determine whether the response to this question is independent of gender. The number of degrees of freedom for the chi-square test in this situation is

- (A) 6
- (B) 5
- (C) 3
- (D) 2
- (E) 1

Let  $X$  represent the number on the face that lands up when a fair six-sided number cube is tossed. The expected value of  $X$  is 3.5, and the standard deviation of  $X$  is approximately 1.708. Two fair six-sided number cubes will be tossed, and the numbers appearing on the faces that land up will be added. Which of the following values is closest to the standard deviation of the resulting sum?

- (A) 1.708
- (B) 1.848
- (C) 2.415
- (D) 3.416
- (E) 5.835

Based on previous research, the standard deviation of the distribution of the age at which children begin to walk is estimated to be 1.5 months. A random sample of children will be selected, and the age at which each child begins to walk will be recorded. A 99 percent confidence interval for the average age at which children begin to walk will be constructed using the data obtained from the sample of children. Of the following, which is the smallest sample size that will result in a margin of error of 0.1 month or less for the confidence interval?

- (A) 400
- (B) 900
- (C) 1,300
- (D) 1,600
- (E) 2,100

Which of the following is a criterion for choosing a  $t$ -test rather than a  $z$ -test when making an inference about the mean of a population?

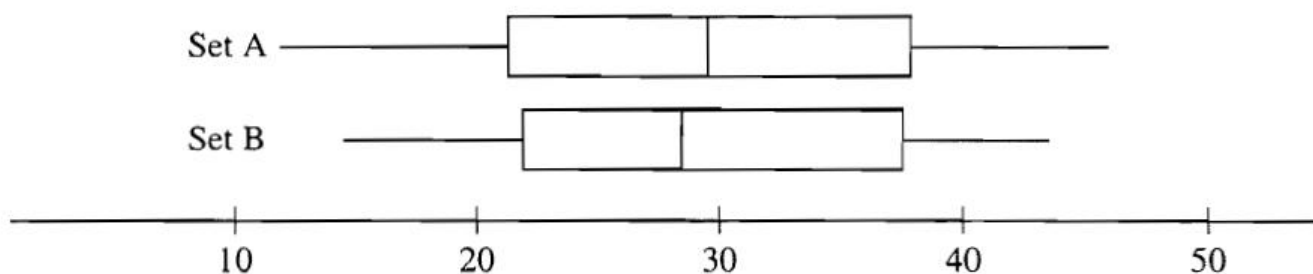
- (A) The standard deviation of the population is unknown.
- (B) The mean of the population is unknown.
- (C) The sample may not have been a simple random sample.
- (D) The population is not normally distributed.
- (E) The sample size is less than 100.

Which of the following can be used to show a cause-and-effect relationship between two variables?

- (A) A census
- (B) A controlled experiment
- (C) An observational study
- (D) A sample survey
- (E) A cross-sectional survey

Gina's doctor told her that the standardized score ( $z$ -score) for her systolic blood pressure, as compared to the blood pressure of other women her age, is 1.50. Which of the following is the best interpretation of this standardized score?

- (A) Gina's systolic blood pressure is 150.
- (B) Gina's systolic blood pressure is 1.50 standard deviations above the average systolic blood pressure of women her age.
- (C) Gina's systolic blood pressure is 1.50 above the average systolic blood pressure of women her age.
- (D) Gina's systolic blood pressure is 1.50 times the average systolic blood pressure for women her age.
- (E) Only 1.5% of women Gina's age have a higher systolic blood pressure than she does.



The boxplots above summarize two data sets, A and B. Which of the following must be true?

- I. Set A contains more data than Set B.
- II. The box of Set A contains more data than the box of Set B.
- III. The data in Set A have a larger range than the data in Set B.

- (A) I only
- (B) III only
- (C) I and II only
- (D) II and III only
- (E) I, II, and III

A company wanted to determine the health care costs of its employees. A sample of 25 employees were interviewed and their medical expenses for the previous year were determined. Later the company discovered that the highest medical expense in the sample was mistakenly recorded as 10 times the actual amount. However, after correcting the error, the corrected amount was still greater than or equal to any other medical expense in the sample. Which of the following sample statistics must have remained the same after the correction was made?

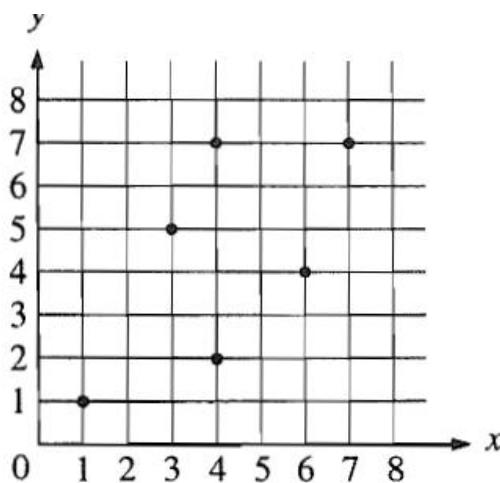
- (A) Mean
- (B) Median
- (C) Mode
- (D) Range
- (E) Variance

A random sample of the costs of repair jobs at a large muffler repair shop produces a mean of \$127.95 and a standard deviation of \$24.03. If the size of this sample is 40, which of the following is an approximate 90 percent confidence interval for the average cost of a repair at this repair shop?

- (A)  $\$127.95 \pm \$4.87$
- (B)  $\$127.95 \pm \$6.25$
- (C)  $\$127.95 \pm \$7.45$
- (D)  $\$127.95 \pm \$30.81$
- (E)  $\$127.95 \pm \$39.53$

At a college the scores on the chemistry final exam are approximately normally distributed, with a mean of 75 and a standard deviation of 12. The scores on the calculus final are also approximately normally distributed, with a mean of 80 and a standard deviation of 8. A student scored 81 on the chemistry final and 84 on the calculus final. Relative to the students in each respective class, in which subject did this student do better?

- (A) The student did better in chemistry.
- (B) The student did better in calculus.
- (C) The student did equally well in each course.
- (D) There is no basis for comparison, since the subjects are different from each other and are in different departments.
- (E) There is not enough information for comparison, because the number of students in each class is not known.



The equation of the least squares regression line for the points on the scatterplot above is  $\hat{y} = 1.3 + 0.73x$ . What is the residual for the point (4, 7) ?

- (A) 2.78
- (B) 3.00
- (C) 4.00
- (D) 4.22
- (E) 7.00

The distribution of the weights of loaves of bread from a certain bakery follows approximately a normal distribution. Based on a very large sample, it was found that 10 percent of the loaves weighed less than 15.34 ounces, and 20 percent of the loaves weighed more than 16.31 ounces. What are the mean and standard deviation of the distribution of the weights of the loaves of bread?

- (A)  $\mu = 15.82$ ,  $\sigma = 0.48$
- (B)  $\mu = 15.82$ ,  $\sigma = 0.69$
- (C)  $\mu = 15.87$ ,  $\sigma = 0.50$
- (D)  $\mu = 15.93$ ,  $\sigma = 0.46$
- (E)  $\mu = 16.00$ ,  $\sigma = 0.50$