

1. A random sample of eighty-five students in Chicago city high schools takes a course designed to improve SAT scores. Based on these students, a 90% confidence interval for the mean improvement in SAT scores from this course for all Chicago city high school students is computed as (72.3, 91.4) points. The correct interpretation of this interval is

- A. that 90% of the students in the sample had their scores improve by between 72.3 and 91.4 points.
 - B. that 90% of the students in the population should have their scores improve by between 72.3 and 91.4 points.
 - C. None of the above.
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2. Crop researchers plant 100 plots with a new variety of corn. The average yield for these plots is $\bar{x} = 130$ bushels per acre. Assume that the yield per acre for the new variety of corn follows a normal distribution with unknown mean μ and standard deviation $\sigma = 10$ bushels per acre. A 90% confidence interval for μ is

- A. 130 ± 1.645 .
 - B. 130 ± 1.96 .
 - C. 130 ± 16.45 .
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3. I collect a random sample of size n from a population with standard deviation σ and, from the data collected, I compute a 95% confidence interval for the mean of the population. Which of the following would produce a new confidence interval with smaller width (smaller margin of error) based on these same data?

- A. Increase σ .
 - B. Use a lower confidence level.
 - C. Use a smaller sample size.
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4. To assess the accuracy of a kitchen scale, a standard weight that is known to weigh 1 gram is repeatedly weighed a total of n times, and the mean \bar{x} of the weighings is computed. Suppose the scale readings are normally distributed with unknown mean μ and standard deviation $\sigma = 0.01$ g. How large should n be so that a 90% confidence interval for μ has a margin of error of 0.0001?

- A. 165
 - B. 27061
 - C. 38416
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5. A student wanted to estimate the number of chocolate chips in a commercial brand of cookie. He sampled 100 cookies and found an average of 10.5 chips per cookie. If we assume the standard deviation is 8, what is a 99% confidence interval for the average number of chips per cookie?

- A. (8.4, 12.6)
- B. (8.9, 12.1)
- C. (5.3, 10.7)

6. A researcher is interested in the average time served in jail for robbery. He takes a sample of 400 convictions, and finds the average time served is $\bar{x} = 7.5$ years, with a standard deviation $s = 3$ years. Since the sample is so large, it is reasonable to believe that s is close to σ . A 95% confidence interval for the average time served in jail for robbery is

- A. (7.25, 7.75).
 - B. (7.21, 7.79).
 - C. (7.11, 7.89).
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7. A student curious about the average number of chocolate chips in a commercial brand of cookie estimated the standard deviation to be 8. If he wants to be 99% confident in his results, how many chocolate chip cookies will he need to sample to estimate the mean to within 2 chocolate chips?

- A. 11
 - B. 107
 - C. 62
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8. I have computed a 95% confidence interval for the mean, μ , of a population as (13, 20). Based on this interval

- A. There is a 95% chance μ is in the interval.
 - B. 95% of the observations lie in the interval.
 - C. The method gives correct results 95% of the time.
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9. I computed a 95% confidence interval for the mean lifetime of a set of tires as (37,000, 42,000). Based on this interval, I know

- A. The margin of error is 2500 miles.
 - B. The sample mean \bar{x} , is 39,500 miles.
 - C. Both A and B are true.
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10. Bob and Mary each asked a random sample of 25 fellow students what their score was on the SAT Math test. This test is designed to have a standard deviation of about 100. Both Bob and Mary used the results of their samples to compute a 95% confidence interval for the average SAT Math score for all students at their college. Bob said his interval was 960.8 to 1039.2. Mary said her interval was from 1040.8 to 1119.2. The difference in the results was because

- A. Bob incorrectly determined the margin of error.
- B. Mary had a different sample from Bob.
- C. Someone made a calculation error.