Question ID 90eed2e5

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Inference from sample statistics and margin of error	■□□

ID: 90eed2e5

A city has 50 city council members. A reporter polled a random sample of 20 city council members and found that 6 of those polled supported a specific bill. Based on the sample, which of the following is the best estimate of the number of city council members in the city who support the bill?

A. 6

B. 9

C. 15

D. 30

ID: 90eed2e5 Answer

Rationale

Choice C is correct. Because a random sample of the city council was polled, the proportion of the sample who supported the bill is expected to be approximately equal to the proportion of the total city council who supports the bill. Since 6 of the 20 polled, or 30%, supported the bill, it can be estimated that 50×0.3, or 15, city council members support the bill.

Choice A is incorrect. This is the number of city council members in the sample who supported the bill. Choice B is incorrect and may result from a computational error. Choice D is incorrect. This is the number of city council members in the sample of city council members who were not polled.

Question Difficulty: Easy

Question ID e7d9649f

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Inference from sample statistics and margin of error	■□□

ID: e7d9649f

A random sample of 50 people from a town with a population of 14,878 were asked to name their favorite flavor of ice cream. If 7 people in the sample named chocolate as their favorite ice-cream flavor, about how many people in the town would be expected to name chocolate?

A. 350

B. 2,100

C. 7,500

D. 10,500

ID: e7d9649f Answer

Correct Answer: B

Rationale

Choice B is correct. Let x be the number of people in the entire town that would be expected to name chocolate. Since the sample of 50 people was selected at random, it is reasonable to expect that the proportion of people who named chocolate as their favorite ice-cream flavor would be the same for both the sample and the town population. Symbolically, this can be expressed as $\frac{7}{50} = \frac{x}{14{,}878}$. Using cross multiplication, $7 \times 14{,}878 = x \times 50$; solving for x yields 2,083. The choice closest to the value of 2,083 is choice B, 2,100.

Choices A, C, and D are incorrect and may be the result of errors when setting up the proportion, solving for the unknown, or incorrectly comparing the choices to the number of people expected to name chocolate, 2,083.

Question Difficulty: Easy

Question ID f4b3672a

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Inference from sample statistics and margin of error	■□□

ID: f4b3672a

A certain forest is 253 acres. To estimate the number of trees in the forest, a ranger randomly selects 5 different 1-acre parcels in the forest and determines the number of trees in each parcel. The numbers of trees in the sample acres are 51, 59, 45, 52, and 73. Based on the mean of the sample, which of the following ranges contains the best estimate for the number of trees in the entire forest?

A. 11,000 to 12,000

B. 12,500 to 13,500

C. 13,500 to 14,500

D. 18,000 to 19,000

ID: f4b3672a Answer

Correct Answer: C

Rationale

Choice C is correct. The mean of the 5 samples is $\frac{51+59+45+52+73}{5}=56$ trees per acre. The best estimate for the total number of trees in the forest is the product of the mean number of trees per acre in the sample and the total number of acres in the forest. This is (56)(253) = 14,168, which is between 13,500 and 14,500.

Choice A is incorrect and may result from multiplying the minimum number of trees per acre in the sample, 45, by the number of acres, 253. Choice B is incorrect and may result from multiplying the median number of trees per acre in the sample, 52, by the number of acres, 253. Choice D is incorrect and may result from multiplying the maximum number of trees per acre in the sample, 73, by the number of acres, 253.

Question Difficulty: Easy

Question ID 0108ac2d

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Inference from sample statistics and margin of error	■□□

ID: 0108ac2d

At a large high school, 300 students were selected at random and were asked in a survey about a menu change in the school cafeteria. All 300 students completed the survey. It was estimated that 38% of the students were in support of a menu change, with a margin of error of 5.5%. Which of the following is the best interpretation of the survey results?

A. The percent of the students at the school who support a menu change is 38%.

B. The percent of the students at the school who support a menu change is greater than 38%.

C. Plausible values of the percent of the students at the school who support a menu change are between 32.5% and 43.5%.

D. Plausible values of the number of the students at the school who support a menu change are between 295 and 305.

ID: 0108ac2d Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that an estimated 38% of sampled students at the school were in support of a menu change, with a margin of error of 5.5%. It follows that the percent of the students at the school who support a menu change is 38% plus or minus 5.5%. The lower bound of this estimation is $38-5.5$, or 32.5%. The upper bound of this estimation is $38+5.5$, or 43.5%. Therefore, plausible values of the percent of the students at the school who support a menu change are between 32.5% and 43.5%.

Choice A is incorrect. This is the percent of the sampled students at the school who support a menu change. Choices B and D are incorrect and may result from misinterpreting the margin of error.

Question Difficulty: Easy

Question ID 6a305cd0

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Inference from sample statistics and margin of error	■□□

ID: 6a305cd0

In a study, the data from a random sample of a population had a mean of 37, with an associated margin of error of 3. Which of the following is the most appropriate conclusion that can be made about the population mean?

A. It is less than 37.

B. It is greater than 37.

C. It is between 34 and 40.

D. It is less than 34 or greater than 40.

ID: 6a305cd0 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the mean of the data from a random sample of a population is 37, with an associated margin of error of 3. The most appropriate conclusion that can be made is that the mean of the entire population will fall between 37, plus or minus 3. Therefore, the population mean is between $37-3=34$ and $37+3=40$.

Choice A is incorrect. While it's an appropriate conclusion that the population mean is as low as $37-3$, or 34, it isn't appropriate to conclude that the population mean is less than 34. Choice B is incorrect. While it's an appropriate conclusion that the population mean is as high as $37+3$, or 40, it isn't appropriate to conclude that the population mean is greater than 40. Choice D is incorrect. It isn't an appropriate conclusion that the population mean is less than 34 or greater than 40.

Question Difficulty: Easy