

Ottocento Lesson #3 Confidence Interval & Margin of Error Worksheet

Video Solutions at: <https://youtu.be/RBrT3rz-3UI>

Question 1

To estimate the proportion of a population that has a certain characteristic, a random sample was selected from the population. Based on the sample, it is estimated that the proportion of the population that has the characteristic is 0.57, with an associated margin of error of 0.09. Based on this estimate and the margin of error, which of the following is the most appropriate conclusion about the proportion of the population that has the characteristic?

- A) It is plausible that the proportion is less than 0.48.
- B) It is plausible that the proportion is between 0.48 and 0.66.
- C) The proportion is exactly 0.57.
- D) It is plausible that the proportion is greater than 0.66.

Question 2

To estimate the mean Digital SAT Math score in Toronto, Canada, a random sample of Digital SAT test takers from Toronto was selected. Based on the sample, it is estimated that the mean Digital SAT Math score was 550, with an associated margin of error of 40 points. Based on this estimate and the margin of error, which of the following is the most appropriate conclusion about the mean Digital SAT Math score of all Digital SAT test takers from Toronto?

- A) The mean is exactly 550.
- B) It is certain the mean is between 510 and 590.
- C) Since the sample did not include all test takers from Canada, no conclusion can be made.
- D) It is plausible that the mean is between 510 and 590.



Question 3

A sample consisting of 940 adults who own tablets was selected at random for a study. Based on the sample, it is estimated that 23% of all adults who own tablets use their tablets to play video games, with an associated margin of error of 4.78%. Which of the following is the most plausible conclusion about all adults who own tablets?

- A) Between 18.22% and 27.78% of all adults who own tablets use their tablets to play video games.
- B) Since the sample did not include all the people who play video games, no conclusion can be made.
- C) Less than 18.22% of all adults who own tables use their tablets to play video games.
- D) Between 18.22% and 27.78% of all adults in the sample use their tablets to play video games.

Question 4

A random sample of 10,000 PC gamers was selected and surveyed about their Steam library size. Based on the survey, it is estimated that the mean Steam library size is 472 GB with an associated margin of error of 33 GB. Based on these results, which of the following is a plausible value for the mean Steam library size, in GB, in the population of all PC gamers?

- A) 436
- B) 438
- C) 440
- D) 507



Question 5

From a population of 500,000 people in a city, 10,000 were chosen at random and surveyed about a proposed bill that would decrease the frequency of trash pickup. Based on the survey, it is estimated that 16% of people in the city support the bill, with an associated margin of error of 5%. Based on these results, which of the following is a plausible value for the total number of people in the city who support the proposed bill?

- A) 40,000
- B) 50,000
- C) 100,000
- D) 110,000

Question 6

Researchers found that the mean Digital SAT Reading & Writing score was plausibly between 490 and 560. What was the sample mean score? What was the associated margin of error?

Question 7

Researchers found that the proportion of students who preferred the Digital SAT to the Paper & Pencil SAT was plausibly between 70% and 76%. What was the sample proportion? What was the associated margin of error?



Question 8

Two different Digital SAT test centers estimated the percentage of all test takers who took the Digital SAT on an iPad. They each selected a random sample of test takers at their center and recorded whether the test takers were using an iPad to complete the exam. The results from each sample are shown in the table below.

Sample	Percentage of test takers using an iPad	Margin of Error
A	55%	1%
B	43%	4%

If the associated margin of error was calculated the same way for both samples, which of the following is the most likely reason that the result for Sample B has a larger margin of error?

- A) Sample A included more test takers than Sample B.
- B) Sample B included more test takers than Sample A.
- C) Sample A has a greater percentage of test takers using an iPad than Sample B.
- D) Sample B was selected after Sample A.

Question 9

Sample	Mean lifespan (years)	Margin of Error (years)
A	150	15
B	200	8

The table shows the estimated mean lifespan, in years, and the associated margin of error for each of two samples of oak trees selected at random. Which of the following best explains why the margin of error for Sample A is greater than the margin of error for Sample B?

- A) Sample A has a smaller mean lifespan than Sample B.
- B) Sample B was selected after Sample A.
- C) The size of Sample A is less than the size of Sample B.
- D) The size of Sample A is greater than the size of Sample B.



Question 10

Two different high schools estimated the mean dSAT Math score of all test takers who took the Digital SAT on a laptop. Perhaps viewing a bigger screen and typing on a keyboard made Desmos easier to utilize? They each selected a random sample of test takers at their high school who took the Digital SAT on a laptop and recorded their dSAT Math score. The results from each sample are shown in the table below.

Sample	Mean dSAT Math Score (points)	Margin of Error (points)
A	600	30
B	630	50

If the associated margin of error was calculated the same way for both samples, which of the following could be a possible reason that Sample B had a larger margin of error than Sample A?

- I. Sample B included fewer test takers than Sample A.
 - II. Sample A had a smaller standard deviation than Sample B.
- A) I only
B) II only
C) Either I or II
D) Neither I nor II