

1. Pizza is a very popular item in the school cafeteria. Braulio surveys a random sample of 30 students to estimate the population proportion of students who favor serving pizza daily in the cafeteria. The 95% confidence interval for the true proportion is (0.554, 0.713).
 - a. What is the point estimate that was used to construct the interval?
 - b. What is the margin of error?
 - c. How many students in the sample favored serving pizza daily?

2. Alana wanted to determine the proportion of books at her local bookstore that are published by Penguin Random House, the largest American publishing company. She selected a random sample of 40 books and used the results to calculate a point estimate of 0.25 and a margin of error of 0.134 at the 95% confidence level. Determine whether each value below is plausible for the population proportion and explain your reasoning.
 - a. $p = 0.42$
 - b. $p = 0.19$
 - c. $p = 0.25$

3. A survey of 200 randomly selected adults aged 18 to 29 found that 44% reported being very satisfied with their job. Using a 95% confidence level, the margin of error was 6.8%.
- Identify the population, sample, parameter, and statistic.
 - Construct a confidence interval from the point estimate and margin of error.
 - Interpret the confidence interval.
 - A news article claimed that "less than half of adults aged 18 to 29 are very satisfied with their job." Does the confidence interval support this claim? Explain your reasoning.

4. Akito, Gerard, and Deidra are trying to guess the age of their teacher, Ms. Honeysett. They each give an initial guess, then provide a buffer.

Akito says: "Ms. Honeysett is 37 years old, give or take 3 years."

Gerard says: "Ms. Honeysett is 41 years old, give or take 2 years."

Deidra says: "Ms. Honeysett is 35 years old, give or take 4 years."

- Which student do you think is most sure of their initial guess? Explain your reasoning.
- Which of the three students' intervals includes the largest range of plausible values for Ms. Honeysett's age? Explain your reasoning.
- Should Deidra be more confident or less confident than Gerard that her interval captures Ms. Honeysett's true age? Explain your reasoning.
- Give an age for Ms. Honeysett that all three students would find plausible.

5. A grocery store executive has been receiving complaints from customers about bruised apples. The store receives a new shipment of apples on Monday. The executive selects a random sample of 30 apples from this shipment and counts the number of bruised apples. A 95% confidence interval for the population proportion of bruised apples in this shipment is (0.01, 0.25).

- Is it plausible that 30% of the apples in this shipment are bruised? Explain.
- Is it possible that 30% of the apples in this shipment are bruised? Explain.
- If the executive constructs many 95% confidence intervals using a different sample of size 30 for each, about what percentage of these intervals would not contain the population proportion of bruised apples?

6. A survey conducted in a particular metropolitan city estimated that 12 percent of workers in that city walked to work. The margin of error was 2 percentage points. Which of the following statements is an appropriate conclusion based on the estimate and the margin of error?
- A) There is a 2% chance that the true percentage of workers in that city who walk to work is 12%.
 - B) The true percentage of workers in that city who walk to work is either 12% or 14%.
 - C) It is plausible that 10.5% of workers in that city walk to work.
 - D) Between 10% and 14% of people in this city were included in the survey.
7. While working on a school project, Mosi decided to do some research on U.S. presidents and found that 31 of the 46 U.S. presidents had served in the military. Which statement is true about this proportion?
- A) Mosi should construct a confidence interval to estimate the proportion of all U.S. presidents who had prior military service.
 - B) Mosi can conclude that the true proportion of all U.S. presidents who had prior military service is about 0.67.
 - C) Mosi's investigation is not statistically sound, because she did not select a random sample of presidents.
 - D) Mosi used a convenience sample, so her findings are unlikely to represent the total population of all U.S. presidents.