

1. State the critical t-values for constructing a confidence interval about a population mean at the given level of confidence for the given sample size of, n.

a. 96% confidence, $n = 26$ 2.167

b. 98% confidence, $n = 18$ 2.567

2. A random sample of 50 recent college graduates results in a mean time to graduate of 4.58 years, with a standard deviation of 1.10 years

- a. Compute and interpret a 90% confidence interval for time to graduate with a bachelor's degree.

$$4.319 \leq \mu \leq 4.841$$

- b. Does the evidence contradict the widely held belief that it takes 4 years to complete a bachelor's degree? Hint: Try a hypothesis test using the confidence interval approach.

$$H_0: \mu = 4$$

$$H_1: \mu \neq 4$$

Yes, the hypothesized mean does not fall within the boundaries of the C.I.

3. Determine the point estimate of the population mean and margin of error if the confidence interval has a lower bound of 125.8 and an upper bound of 152.6.

$$125.8 - 152.6$$

$$\bar{x} = 139.2 \quad E = 13.4$$

4. Suppose Motorola wishes to estimate the mean talk time for its V505 camera phone before the battery must be recharged. In a random sample of 35 phones, the sample mean talk time was 325 minutes.

- a. Why can we say that the sampling distribution of the sample mean is approximately normal?

Large Sample $n \geq 30$

- b. Construct a 94% confidence interval for the mean talk time for all Motorola V505 camera phones, assuming that $\sigma = 31$ minutes.

$$315.1 \leq \mu \leq 334.9$$

- c. Construct a 98% confidence interval for the mean talk time for all Motorola V505 camera phones, assuming that $\sigma = 31$ minutes.

$$312.8 \leq \mu \leq 337.2$$

5. From a random sample of 1201 Americans, it was discovered that 1139 of them live in neighborhoods with acceptable levels of carbon monoxide.

- a. Obtain a point estimate for the proportion of Americans who live in neighborhoods with acceptable levels of carbon monoxide.

$$\hat{p} = .948$$

- b. Construct a 99% confidence interval for the proportion of Americans who live in neighborhoods with acceptable levels of carbon monoxide.

$$.932 < p < .964$$

- c. What is the minimum sample size necessary if you were planning to conduct your own study with the conditions indicated in the problem. Your work must be good to within 1.5% with a 90% level of confidence.

593 subjects

6. In 2001, the mean contract interest rate for a conventional 30-yr first loan for the purchase of a single family home was 6.3%. A real estate agent believes that the rates are lower today and obtains a simple random sample of 41 recent 30-yr loans. The mean interest rate was found to be 6.05% with a standard deviation of 1.75%. Is this enough evidence to conclude that rates are lower today than they were in 2001? Use $\alpha = 0.05$. (Use both a classical and a p-value approach)

$$H_0: \mu \geq 6.3\%$$

$$H_1: \mu < 6.3\% \text{ (claim)}$$

Classical Approach

$$t = -0.95$$

Do not reject H_0

P-value Approach

$$P\text{-value} = .1829$$

Do not reject H_0