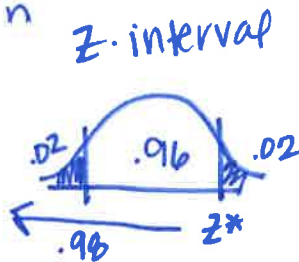


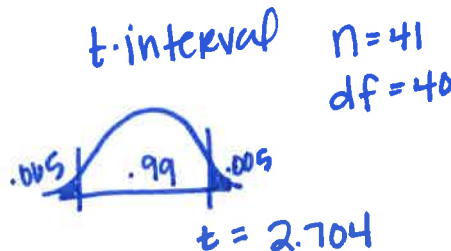
1. You want to compute a 96% confidence interval for a population mean. Assume that the population standard deviation is known to be 10 and the sample size is 50. The critical value to be used in this calculation is

(a) 1.960
(b) 1.645
(c) 1.7507
(d) 2.0537
(e) None of the above



2. A researcher is interested in determining the mean energy consumption of a new compact florescent light bulb. She takes a random sample of 41 bulbs and determines that the mean consumption is 1.3 watts per hour with a standard deviation of 0.7. When constructing a 99% confidence interval, which would be the most appropriate value of the critical value?

(a) 2.072
(b) 1.936
(c) 2.250
(d) 2.704
(e) 2.807



3. An SRS of 100 postal employees found that the average time these employees had worked for the postal service was $\bar{x} = 7$ years with standard deviation of $s = 2$ years. Assume the distribution of the time the population of employees has worked for the postal service is approximately Normal. A 95% confidence interval for the mean time μ the population of postal service employees has spent with the postal service is

(a) 7 ± 2
(b) 7 ± 1.984
(c) 7 ± 0.525
(d) 7 ± 0.4
(e) 7 ± 0.2

t-interval

$$7 \pm t^* \frac{s}{\sqrt{n}}$$

$$= 7 \pm (1.984) \left(\frac{2}{\sqrt{100}} \right)$$

$$= 7 \pm 0.3968$$

4. The standardized test scores of 16 students have a mean $\bar{x} = 200$ and a standard deviation $s = 20$. What is the standard error of \bar{x} ?

(a) 20
(b) 10
(c) 5
(d) 1.25
(e) 0.80

$$\frac{s}{\sqrt{n}} = \frac{20}{\sqrt{16}}$$

5. A 95% confidence interval for the mean reading achievement score for a population of 3rd grade students is (41, 49). The margin of error of this interval is

(a) 95%
(b) 8
(c) 4
(d) 2.5
(e) None of the above

$$(41, 49)$$

$$45 \pm 4$$

6. In an opinion poll, 25% of a random sample of 200 people said that they were strongly opposed to have a state lottery. The standard error of the sample proportion is approximately

(a) 0.03
(b) 0.25
(c) 0.0094
(d) 6.12
(e) 0.06

$$\sqrt{\hat{p}(1-\hat{p})}$$

$$= \sqrt{\frac{.25(.75)}{200}} = .0306$$

7. How large of a random sample is required to insure that the margin of error is 0.08 when estimating the proportion of college professors that read science fiction novels with 95% confidence?

(a) 600
(b) 300
(c) 150
(d) 75
(e) 25

$$m \geq z^* \sqrt{\frac{p^*(1-p^*)}{n}}$$

$$.08 \geq 1.96 \sqrt{\frac{.5(.5)}{n}}$$

$$.0408 \geq \sqrt{\frac{.25}{n}}$$

$$n \geq 150.0625$$

8. Suppose that the population of the scores of all high school seniors who took the SAT Math test this year follows a normal distribution with mean μ and standard deviation $\sigma = 100$. You read a report that says "on the basis of a simple random sample of 100 high school seniors that took the SAT-M test this year, a confidence interval for μ is 512.00 ± 25.76 "

The confidence level for this interval is

(a) 90%
(b) 95%
(c) 99%
(d) 99.5%
(e) Over 99.9%

$$512 \pm 25.76$$

$$25.76 = z^* \frac{\sigma}{\sqrt{n}}$$

$$25.76 = z^* \frac{100}{\sqrt{100}}$$

$$99\% \rightarrow 2.576 = z^*$$

9. An analyst, using a random sample of $n = 500$ families, obtained 90% confidence interval for mean monthly income for a large population: $(\$600, \$800)$. If the analyst had used a 99% confidence level instead, the confidence interval would be:
- (a) ~~Narrower~~ and would involve a larger risk of being incorrect
 (b) Wider and would involve a smaller risk of being incorrect
 (c) ~~Narrower~~ and would involve a smaller risk of being incorrect
 (d) ~~Wider~~ and would involve a larger risk of being incorrect
 (e) ~~Wider~~, but it cannot be determined whether the risk of being incorrect would be larger or smaller
10. An agricultural researcher plants 25 plots with a new variety of corn. A 90% confidence interval for the average yield for these plots is found to be 162.72 ± 4.47 bushels per acre. Which of the following is the correct interpretation of the interval?
- (a) there is a 90% chance the interval from 158.28 to 167.17 captures the true average yield.
 (b) 90% of the samples average yields will be between 158.28 and 167.19 bushels per acre.
 (c) We are 90% confident the interval from 158.28 to 167.19 captures the true average yield.
 (d) 90% of the time, the true average yield will fall between 158.28 and 167.19.
 (e) ~~We are 90% confident the true average yield is 162.72.~~
11. A 95% confidence interval for the mean reading achievement score for a population of third grade students is (4.2, 54.2). Suppose you compute a 99% confidence interval using the same information. Which of the following is true?
- (a) ~~The intervals have the same width.~~
 (b) ~~The 99% interval is shorter.~~
 (c) The 99% interval is longer.
 (d) ~~The answer can't be determined from the information given.~~
 (e) ~~None of the above.~~
12. A radio talk show host with a large audience, say over 1000 listeners, is interested in the proportion p of adults in his listening area who think the drinking age should be lowered to eighteen. To find this out he poses the following question to his listeners. "Do you think that the drinking age should be reduced to 18 in light of the fact that 18-year olds are eligible for military service?" he asks listeners to phone in and vote "YES" if they agree the drinking age should be lowered and "no" if not. Of the 100 people who phone in, 70 answered "yes." Which of the following conditions for inference about a proportion using a confidence interval are violated?
- (a) The data are an SRS from the population of interest *not an SRS - convenience sample*
 (b) The population is at least 10 times as large as the sample $N \geq 10(100) = 1000$; *more than 1000 ppl listening?*
 (c) ~~n is so large that both the count of successes $n\hat{p}$ and the count of failures $n(1 - \hat{p})$ are 10 or more.~~
 (d) ~~There appear to be no violations.~~
 (e) ~~More than one condition is violated.~~
13. A Gallup poll found that only 28% of American adults expect to inherit money or valuable possessions from a relative. The poll's margin of error was ± 3 percentage points at a 95% confidence level. This means that
- (a) ~~The poll used a method that gets an answer within 3% of the truth about the population 95% of the time.~~
 (b) The percent of all adults who expect to inherit is between 25% and 31%.
 (c) ~~If Gallup takes another poll on this issue, the results of the second poll will lie between 25% and 31%.~~
 (d) ~~There's a 95% chance that the percent of all adults who expect an inheritance is between 25% and 31%.~~
 (e) ~~Gallup can be 95% confident that between 25% and 31% of the sample expect an inheritance.~~
14. A pollster took a random sample of 100 students from a large university and computed a 95% confidence interval to estimate the average number of students who were planning to vote in the upcoming election. The pollster felt that the confidence interval was too wide to provide a precise estimate of the population parameter. What could the pollster have done to produce a narrower confidence interval.
- (a) increase the sample size to 150
 (b) ~~increase the confidence level to 99%~~
 (c) ~~decrease the sample size to 75~~
 (d) ~~decrease the confidence level to 90%~~
 (e) both (a) and (b)
 (f) both (c) and (d)
 (g) both (a) and (d)
 (h) both (b) and (c)
 (i) none of the above