Practice 4b.

Find the indicated critical z value.

1) Find the critical value $z_{\alpha/2}$ that corresponds to a 98% confidence level. 1) ________

A) 2.05 B) 2.33 C) 1.75 D) 2.575

Inverse normal (on calculator), with area = $\alpha/2$

$\alpha = 1 - 0.98 = 0.02$ Therefore, $\alpha/2 = 0.02/2 = 0.01$ and $\mu = 0$, $\sigma = 1$ (default values for z scores)

Express the confidence interval using the indicated format.

2) Express the confidence interval $0.061 < p < 0.579$ in the form of $\hat{p} \pm E$. 2) ________

A) 0.259 ± 0.32 B) $0.259 - 0.32$ C) 0.32 ± 0.259 D) 0.259 ± 0.5

$\hat{p}$ = (lower bound + upper bound)/2 = (0.061 + 0.579)/2 = 0.32

E = (Upper bound - Lower bound)/2

E = (0.579 - 0.061)/2 = 0.259

Assume that a sample is used to estimate a population proportion p. Find the margin of error E that corresponds to the given statistics and confidence level. Round the margin of error to four decimal places.

3) 90% confidence; n = 430, x = 80 3) ________

A) 0.0368 B) 0.0309 C) 0.0331 D) 0.0386

Calculators: 1PropZInt with n =430, x = 80, C-Level: 0.90

Obtain the interval: 0.15517, 0.21691 and E = (Upper bound - Lower bound)/2 = 0.0617/2 0.03087

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion p.

4) n = 96, x = 43; 98% confidence 4) ________

A) $0.329 < p < 0.567$ B) $0.330 < p < 0.566$

C) $0.348 < p < 0.548$ D) $0.349 < p < 0.547$

Calculators: 1PropZInt with n =96, x = 43, C-Level: 0.98

Use the given data to find the minimum sample size required to estimate the population proportion.

5) Margin of error: 0.044; confidence level: 95%; $\hat{p}$ and $\hat{q}$ unknown 5) ________

A) 352 B) 405 C) 497 D) 635

Sample size formula (proportions), $n = (z_{\alpha/2})^2 * 0.25/E^2$ $= 1.96^2 * 0.25 / 0.044^2 = 496.07 = 497$

Notice that for sample size determination we always round the result up.

6) Margin of error: 0.03; confidence level: 95%; from a prior study, $\hat{p}$ is estimated by the decimal equivalent of 66%. 6) ________

A) 958 B) 2817 C) 1654 D) 862

Sample size formula (proportions), $n = (z_{\alpha/2})^2 * \hat{p} * \hat{q} / E^2$ $= 1.96^2 * .66 * 0.34 / 0.03^2 = 957.83 = 958$

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion p.

7) A survey of 865 voters in one state reveals that 408 favor approval of an issue before the legislature. Construct the 95% confidence interval for the true proportion of all voters in the state who favor approval. 7) ______

A) $0.444 < p < 0.500$ B) $0.471 < p < 0.472$
C) $0.438 < p < 0.505$ D) $0.435 < p < 0.508$

Calculators: 1PropZInt with n =865, x = 408, C-Level: 0.95

Use the given degree of confidence and sample data to construct a confidence interval for the population mean μ. Assume that the population has a normal distribution.

8) $n = 10$, $\bar{x} = 12.7$, $s = 3.7$, 95% confidence 8) ______

A) $10.09 < \mu < 15.31$ B) $10.05 < \mu < 15.35$
C) $10.07 < \mu < 15.33$ D) $10.56 < \mu < 14.84$

T interval with: $\bar{x} = 12.7$, sx = 3.7, n =10, C-Level: 0.95

9) A laboratory tested twelve chicken eggs and found that the mean amount of cholesterol was 198 milligrams with s = 10.5 milligrams. Construct a 95% confidence interval for the true mean cholesterol content of all such eggs. 9) ______

A) 191.4 mg < μ < 204.6 mg B) 191.2 mg < μ < 204.8 mg
C) 192.6 mg < μ < 203.4 mg D) 191.3 mg < μ < 204.7 mg

T interval with: $\bar{x} = 198$, sx = 10.5, n =12, C-Level: 0.95

10) The amounts (in ounces) of juice in eight randomly selected juice bottles are: 10) ______

15.3 15.3 15.7 15.7
15.3 15.9 15.3 15.9

Construct a 98% confidence interval for the mean amount of juice in all such bottles.

A) 15.17 oz < μ < 15.93 oz B) 15.27 oz < μ < 15.83 oz
C) 15.83 oz < μ < 15.27 oz D) 15.93 oz < μ < 15.17 oz

T interval with raw data. Enter data on List 1, then proceed with T-Interval.

Use the confidence level and sample data to find a confidence interval for estimating the population μ. Round your answer to the same number of decimal places as the sample mean.

11) Test scores: $n = 79$, $\bar{x} = 65.0$, $\sigma = 5.0$; 98% confidence 11) ______

A) $64.1 < \mu < 65.9$ B) $63.5 < \mu < 66.5$ C) $63.7 < \mu < 66.3$ D) $63.9 < \mu < 66.1$

Interval for means, σ given; therefore, this is a Z-Interval with n = 79, $\bar{x} = 65.0$, $\sigma = 5.0$; C-Level: 0.98

Use the given information to find the minimum sample size required to estimate an unknown population mean μ.

12) Margin of error: \$134, confidence level: 95%, σ = \$575 12) ______

A) 62 B) 71 C) 50 D) 100

Sample size, mean: $n = [(z_{\alpha/2} * \sigma)/E]^2 = [(1.96 * 575)/134]^2 = 70.7 = 71$

Notice that for sample size determination we always round the result up.

1) B
2) C
3) B
4) B
5) C
6) A
7) C
8) B
9) D
10) B
11) C
12) B