

Practice 7. Broward College.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

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
- 2) Find the critical value  $z_{\alpha/2}$  that corresponds to a 91% confidence level. 2) \_\_\_\_\_  
 A) 1.645                      B) 1.34                      C) 1.70                      D) 1.75
- 3) Find the critical value  $z_{\alpha/2}$  that corresponds to a 96% confidence level. 3) \_\_\_\_\_  
 A) 2.65                      B) 1.75                      C) 1.95                      D) 2.05

Express the confidence interval using the indicated format.

- 4) Express the confidence interval  $-0.061 < p < 0.579$  in the form of  $\hat{p} \pm E$ . 4) \_\_\_\_\_  
 A)  $0.259 \pm 0.32$                       B)  $0.259 - 0.32$                       C)  $0.32 \pm 0.5$                       D)  $0.259 \pm 0.5$

Solve the problem.

- 5) The following confidence interval is obtained for a population proportion,  $p$ :  $(0.822, 0.862)$ . Use these confidence interval limits to find the point estimate,  $\hat{p}$ . 5) \_\_\_\_\_  
 A) 0.842                      B) 0.822                      C) 0.848                      D) 0.862
- 6) The following confidence interval is obtained for a population proportion,  $p$ :  $0.686 < p < 0.712$ . Use these confidence interval limits to find the point estimate,  $\hat{p}$ . 6) \_\_\_\_\_  
 A) 0.704                      B) 0.699                      C) 0.694                      D) 0.686

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.

- 7) 95% confidence;  $n = 470, x = 50$  7) \_\_\_\_\_  
 A) 0.0279                      B) 0.0251                      C) 0.0293                      D) 0.0335
- 8) 90% confidence;  $n = 430, x = 80$  8) \_\_\_\_\_  
 A) 0.0368                      B) 0.0309                      C) 0.0331                      D) 0.0386

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

- 9)  $n = 51, x = 23$ ; 95% confidence 9) \_\_\_\_\_  
 A)  $0.314 < p < 0.588$                       B)  $0.313 < p < 0.589$   
 C)  $0.336 < p < 0.566$                       D)  $0.335 < p < 0.567$
- 10)  $n = 96, x = 43$ ; 98% confidence 10) \_\_\_\_\_  
 A)  $0.329 < p < 0.567$                       B)  $0.330 < p < 0.566$   
 C)  $0.348 < p < 0.548$                       D)  $0.349 < p < 0.547$
- 11)  $n = 110, x = 68$ ; 88% confidence 11) \_\_\_\_\_  
 A)  $0.541 < p < 0.695$                       B)  $0.545 < p < 0.691$   
 C)  $0.546 < p < 0.690$                       D)  $0.542 < p < 0.694$

- 12)  $n = 150, x = 54$ ; 90% confidence 12) \_\_\_\_\_  
 A)  $0.299 < p < 0.421$  B)  $0.298 < p < 0.422$   
 C)  $0.294 < p < 0.426$  D)  $0.296 < p < 0.424$

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

- 13) Margin of error: 0.008; confidence level: 99%;  $\hat{p}$  and  $\hat{q}$  unknown 13) \_\_\_\_\_  
 A) 26,024 B) 25,894 C) 15,900 D) 25,901

- 14) Margin of error: 0.018; confidence level: 99%;  $\hat{p}$  and  $\hat{q}$  unknown 14) \_\_\_\_\_  
 A) 4966 B) 5117 C) 7116 D) 4114

- 15) Margin of error: 0.03; confidence level: 95%; from a prior study,  $\hat{p}$  is estimated by the decimal equivalent of 66%. 15) \_\_\_\_\_  
 A) 958 B) 2817 C) 1654 D) 862

- 16) Margin of error: 0.04; confidence level: 99%; from a prior study,  $\hat{p}$  is estimated by 0.14. 16) \_\_\_\_\_  
 A) 499 B) 20 C) 289 D) 599

Solve the problem. Round the point estimate to the nearest thousandth.

- 17) 364 randomly selected light bulbs were tested in a laboratory, 124 lasted more than 500 hours. Find a point estimate of the proportion of all light bulbs that last more than 500 hours. 17) \_\_\_\_\_  
 A) 0.254 B) 0.659 C) 0.338 D) 0.341

- 18) 467 randomly selected light bulbs were tested in a laboratory, 287 lasted more than 500 hours. Find a point estimate of the proportion of all light bulbs that last more than 500 hours. 18) \_\_\_\_\_  
 A) 0.612 B) 0.381 C) 0.615 D) 0.385

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

- 19) 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. 19) \_\_\_\_\_  
 A)  $0.444 < p < 0.500$  B)  $0.471 < p < 0.472$   
 C)  $0.438 < p < 0.505$  D)  $0.435 < p < 0.508$

- 20) Of 346 items tested, 12 are found to be defective. Construct the 98% confidence interval for the proportion of all such items that are defective. 20) \_\_\_\_\_  
 A)  $0.0110 < p < 0.0584$  B)  $0.0345 < p < 0.0349$   
 C)  $0.0118 < p < 0.0576$  D)  $0.0154 < p < 0.0540$

- 21) A survey of 300 union members in New York State reveals that 112 favor the Republican candidate for governor. Construct the 98% confidence interval for the true population proportion of all New York State union members who favor the Republican candidate. 21) \_\_\_\_\_  
 A)  $0.316 < p < 0.430$  B)  $0.301 < p < 0.445$   
 C)  $0.308 < p < 0.438$  D)  $0.304 < p < 0.442$

- 22) When 334 college students are randomly selected and surveyed, it is found that 103 own a car. Find a 99% confidence interval for the true proportion of all college students who own a car. 22) \_\_\_\_\_  
 A)  $0.259 < p < 0.358$  B)  $0.267 < p < 0.350$   
 C)  $0.243 < p < 0.373$  D)  $0.250 < p < 0.367$

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

- 23)  $n = 10, \bar{x} = 12.7, s = 3.7, 95\%$  confidence 23) \_\_\_\_\_  
 A)  $10.09 < \mu < 15.31$  B)  $10.05 < \mu < 15.35$   
 C)  $10.07 < \mu < 15.33$  D)  $10.56 < \mu < 14.84$

- 24)  $n = 12, \bar{x} = 21.9, s = 4.0, 99\%$  confidence 24) \_\_\_\_\_  
 A)  $18.24 < \mu < 25.56$  B)  $18.31 < \mu < 25.49$   
 C)  $18.33 < \mu < 25.47$  D)  $18.76 < \mu < 25.04$

- 25) 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. 25) \_\_\_\_\_  
 A)  $191.4 \text{ mg} < \mu < 204.6 \text{ mg}$  B)  $191.2 \text{ mg} < \mu < 204.8 \text{ mg}$   
 C)  $192.6 \text{ mg} < \mu < 203.4 \text{ mg}$  D)  $191.3 \text{ mg} < \mu < 204.7 \text{ mg}$

- 26) The amounts (in ounces) of juice in eight randomly selected juice bottles are: 26) \_\_\_\_\_  
 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)  $15.17 \text{ oz} < \mu < 15.93 \text{ oz}$  B)  $15.27 \text{ oz} < \mu < 15.83 \text{ oz}$   
 C)  $15.83 \text{ oz} < \mu < 15.27 \text{ oz}$  D)  $15.93 \text{ oz} < \mu < 15.17 \text{ oz}$

- 27) The football coach randomly selected ten players and timed how long each player took to perform a certain drill. The times (in minutes) were: 27) \_\_\_\_\_  
 7.2 10.9 9.1 8.5 11.9  
 7.8 6.0 11.7 10.6 12.2  
 Determine a 95% confidence interval for the mean time for all players.  
 A)  $11.07 \text{ min} < \mu < 8.11 \text{ min}$  B)  $8.01 \text{ min} < \mu < 11.17 \text{ min}$   
 C)  $8.11 \text{ min} < \mu < 11.07 \text{ min}$  D)  $11.17 \text{ min} < \mu < 8.01 \text{ min}$

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

- 28) Margin of error: \$134, confidence level: 95%,  $\sigma = \$575$  28) \_\_\_\_\_  
 A) 62 B) 71 C) 50 D) 100

- 29) Margin of error: \$136, confidence level: 99%,  $\sigma = \$584$  29) \_\_\_\_\_  
 A) 62 B) 123 C) 50 D) 71

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

- 30) Test scores:  $n = 102, \bar{x} = 77.4, \sigma = 6.5, 99\%$  confidence 30) \_\_\_\_\_  
 A)  $75.9 < \mu < 78.9$  B)  $76.1 < \mu < 78.7$  C)  $75.7 < \mu < 79.1$  D)  $76.3 < \mu < 78.5$

- 31) Test scores:  $n = 79, \bar{x} = 65.0, \sigma = 5.0, 98\%$  confidence 31) \_\_\_\_\_  
 A)  $64.1 < \mu < 65.9$  B)  $63.5 < \mu < 66.5$  C)  $63.7 < \mu < 66.3$  D)  $63.9 < \mu < 66.1$