

- 1) A sample of 35 different payroll departments found that employees worked an average of 240.6 days a year. If the population standard deviation is 18.8 days, find the 90% confidence interval for the average number of days μ worked by all employees who are paid through payroll departments. 1) _____
 A) ... B) $235.4 < \mu < 245.8$
- 2) A study of 65 bolts of carpet showed that their average length was 78.2 yards. The standard deviation of the population is 2.6 yards. a) Find the best point estimate of the mean. b) Find the 80% confidence interval for the mean length per bolt of carpet? 2) _____
 A) a) 78.2 yards; $77.8 < \mu < 78.6$ B)
- 3) The average number of mosquitos caught in 36 mosquito traps in a particular environment was 800 per trap. The standard deviation of mosquitos caught in the entire population of traps is 100 mosquitos. What is the 99% confidence interval for the true mean number of mosquitos caught in all mosquito traps? 3) _____
 A) ... B) $757 < \mu < 843$
- 4) The average number of mosquitos caught in 36 mosquito traps in a particular environment was 800 per trap. The standard deviation of mosquitos caught in the entire population of traps is 100 mosquitos. What is the 95% confidence interval for the true mean number of mosquitos caught in all mosquito traps? Compare the result to the previous question. Why this interval is smaller? 4) _____
 A) $767 < \mu < 833$
 The 95% confidence is smaller since there is less of a chance that the mean is contained in the interval as opposed to the 99% confidence interval.
 B) --
- 5) Find $t_{\alpha/2}$ for $n = 20$ and a 95% confidence interval. 5) _____
 A) 2.086 B) 1.729 C) 2.093 D) 2.539
- 6) Find the critical value $t_{\alpha/2}$ needed to construct a confidence interval of the given level with the given sample size. Level 90%, sample size 8 6) _____
 A) 1.960 B) 1.895 C) 2.306 D) 2.365
- 7) 5 squirrels were found to have an average weight of 8.9 ounces with a sample standard deviation is 0.9. Find the 95% confidence interval of the true mean weight. 7) _____
 A) ... B) $7.8 < \mu < 10.0$

- 8) Boxes of raisins are labeled as containing 22 ounces. Following are the weights, in ounces, of a sample of 12 boxes. It is reasonable to assume that the population is approximately normal. 8) _____

22.08	22.25	21.95	22.39	22.08	22.11
21.89	21.60	22.34	22.03	22.06	22.32

Construct a 90% confidence interval for the mean weight.

- A) $21.977 < \mu < 22.206$ B) ...

- 9) Six measurements were made of the magnesium ion concentration (in parts per million, or ppm) in a city's municipal water supply, with the following results. It is reasonable to assume that the population is approximately normal. 9) _____

180	176	182	182	216	204
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Calculate the 99% confidence interval for the mean magnesium ion concentration.

- A) $163.5 < \mu < 216.5$ B) ...

- 10) A sample of 400 racing cars showed that 80 of them cost over \$700,000. What is the 99% confidence interval for the true proportion of racing cars that cost over \$700,000? 10) _____

- A) $0.148 < p < 0.252$ B) ...

- 11) A recent study of 750 internet users in Europe found that 35% of internet users were women. What is the 95% confidence interval of the true proportion of women in Europe who use the internet? 11) _____

- A) ... B) $0.316 < p < 0.384$

- 12) A random sample of 100 voters found that 46% were going to vote for a certain candidate. Find the 90% confidence interval for the population proportion of voters who will vote for that candidate. 12) _____

- A) ... B) $37.8\% < p < 54.2\%$

- 13) In a sample of 60 mice, a biologist found that 38% were able to run a maze in 30 seconds or less. Find the 90% confidence interval for the population proportion of mice who can run a maze in 30 seconds or less. 13) _____

- A) $27.7\% < p < 48.3\%$ B) ..

- 14) A college believes that 28% of applicants to that school have parents who have remarried. How large a sample is needed to estimate the true proportion of students who have parents who have remarried to within 3 percentage points with 95% confidence? 14) _____

- A) 610 B) 1292 C) 287 D) 861

- 15) A researcher wants to construct a 90% confidence interval for the proportion of elementary school students in Seward County who receive free or reduced-price school lunches. What sample size is needed so that the confidence interval will have a margin of error of 0.06? 15) _____
- A) 9 B) 17 C) 188 D) 201
- 16) The average greyhound can reach a top speed of 18.9 meters per second. A particular greyhound breeder claims her dogs are faster than the average greyhound. A sample of 50 of her dogs ran, on average, 19.5 meters per second with a population standard deviation of 1.5 meters per second. With $\alpha = 0.05$, 16) _____
- a) State the hypotheses and identify the claim.
 b) Find the critical value.
 c) Compute the test value.
 d) Make the decision.
 e) Summarize the results.
- A) ---
 B) a) $H_0: \mu = 18.9$ $H_a: \mu > 18.9$
 b) 1.645
 c) $Z = 2.83$
 d) Reject Null Hypothesis
 e) There is sufficient evidence to support the claim of greyhound breeder that her dogs are faster than the average greyhound.
- 17) A recent report by the American Medical Association stated the average annual salary of psychiatrists is \$192,000 with a population standard deviation of \$16,000. A group of hospital administrators randomly sampled 32 psychiatrists and found an average annual salary of \$187,000. The group claims that the average annual salary is actually lower than what the American Medical Association reported. With $\alpha = 0.01$, 17) _____
- a) State the hypotheses and identify the claim.
 b) Find the critical value.
 c) Compute the test value.
 d) Make the decision.
 e) Summarize the results.
- A) a) $H_0: \mu = 192,000$ $H_a: \mu < 192,000$
 b) -2.326
 c) $Z = -1.77$
 d) Fail to Reject Null Hypothesis
 e) There is no sufficient evidence to support the administrators claim that the salary is actually lower than what the American Medical Association reported.
 B) --

- 18) Sam Ying, a career counselor, claims the average number of years of schooling for an engineer is 15.8 years. A sample of 12 engineers had a mean of 15.0 years and a standard deviation of 1.5 years. Use the $\alpha = 0.05$ level of significance. 18) _____
- a) State the hypotheses and identify the claim.
 - b) Find the critical value.
 - c) Compute the test value.
 - d) Make the decision.
 - e) Summarize the results.
- A) a) $H_0: \mu = 15.8$ claim; $H_1: \mu \neq 15.8$
- b) 2.201
 - c) $t = -1.84$
 - d) Fail to reject the Null Hypothesis
 - e) There is no sufficient evidence to reject the counselor's claim that the average number of years of schooling for an engineer is 15.8 years.

B) --

- 19) In a survey of 426 cigarette smokers, 61 of them reported that they have tried hypnosis therapy to try to quit smoking. Can you conclude that more than one-tenth of smokers have tried hypnosis therapy? Use the $\alpha = 0.05$ level of significance. 19) _____
- a) State the hypotheses and identify the claim.
 - b) Find the critical value.
 - c) Compute the test value.
 - d) Make the decision.
 - e) Summarize the results.
- A) a) $H_0: p = 0.10$ claim; $H_1: p > 0.10$
- b) 1.645
 - c) 2.97
 - d) Reject the Null Hypothesis
 - e) There is enough evidence to support the claim that more than one-tenth of smokers have tried hypnosis therapy.

B) No

20) Professor Brown teaches at U-Chem university and believes that the rate of first-time failure in his general chemistry classes is 33%. He samples 96 students from last semester who were first-time enrollees in general chemistry and finds that 23 of them failed his course. Using $\alpha = 0.05$, can you conclude that the percentage of failures differs from 33%?

20) _____

a) State the hypotheses and identify the claim.

b) Find the critical value.

c) Compute the test value.

d) Make the decision.

e) Summarize the results.

A) a) $H_0: p = 0.33$ claim; $H_1: p \neq 0.33$

b) 1.96

c) -1.88

d) Fail to reject the Null Hypothesis

e) There is not enough evidence to reject the claim that the rate of first-time failure in his general chemistry classes is 33%

B) ...

Answer Key

Testname: REVIEW04

- 1) B
- 2) A
- 3) B
- 4) A
- 5) C
- 6) B
- 7) B
- 8) A
- 9) A
- 10) A
- 11) B
- 12) B
- 13) A
- 14) D
- 15) C
- 16) B
- 17) A
- 18) A
- 19) A
- 20) A