

Name:

Partners:

Statistics

Date:

Review 7 Version A

[A] Circle whether each statement is true or false.

T F 1. $z_0 = 1.28$ is a critical value.

T F 2. The width of a confidence interval is $2E$.

T F 3. The t distribution is never used for proportions.

T F 4. For a given confidence level, t_0 is smaller than z_0 .

T F 5. The t distribution is used for means when σ is unknown.

T F 6. In the media, margins of error refer to 90% confidence intervals.

T F 7. t is the number of standard deviations a value is from the mean.

T F 8. As degrees of freedom increases, the t distribution approaches the z distribution.

[B] Correct each error.

1. Jordan asks 16 small business owners whether or not they feel tax rates for businesses are too high. Twelve say yes. Give a 90% confidence interval.

$$E = 1.753(\sqrt{(12/16)(4/16)/16}) = .19$$

$$56\% > \hat{p} > 94\%$$

We are 90% confident that between 56% and 94% of the small business owners surveyed feel tax rates for business are too high.

[C] Calculate the sample size needed to achieve the given margin of error for a 90% confidence interval.

1. "Have you ever ridden a motorcycle?" $E = 5\%$

2. "How much do you make per hour?" $E = \$1.00$, $\sigma = \$4.00$.

[D] Give a 95% confidence interval for each of the following, and then state in words exactly what your confidence interval means.

1. Twenty random Brook Knoll students have an average IQ of 108. Assume the population standard deviation is 15.

2. Fifteen of the students surveyed say they like having a tutorial period, and seven say they don't.

3. A sample of 7 adult male reindeer had weights (in kg) of 166, 169, 168, 169, 160, 173, and 169.

[E] Do the following to organize your group's reviews.

1. Make sure your name and your partners' names are at the top of your review the first day.

2. Staple the reviews in order, all facing the same way. Put the staple in the very top left corner if everyone is finished or if the review is due; otherwise put the staple in the top right corner.

Name:

Statistics

Date:

Review 7 Version B

[A] Circle whether each statement is true or false.

- T F 1. $z_0 = 1.28$ is a critical value.
- T F 2. The width of a confidence interval is $2E$.
- T F 3. The t distribution is never used for proportions.
- T F 4. For a given confidence level, t_0 is smaller than z_0 .
- T F 5. The t distribution is used for means when σ is unknown.
- T F 6. In the media, margins of error refer to 90% confidence intervals.
- T F 7. t is the number of standard deviations a value is from the mean.
- T F 8. As degrees of freedom increases, the t distribution approaches the z distribution.

[B] Correct each error.

1. Jordan asks 16 small business owners whether or not they feel tax rates for businesses are too high. Twelve say yes. Give a 90% confidence interval.

$$E = 1.753(\sqrt{(12/16)(4/16)})/16 = .19$$

$$56\% > \hat{p} > 94\%$$

We are 90% confident that between 56% and 94% of the small business owners surveyed feel tax rates for business are too high.

[C] Calculate the sample size needed to achieve the given margin of error for a 95% confidence interval.

1. "Have you ever ridden a motorcycle?" $E = 4\%$

2. "How much do you make per hour?" $E = \$0.75$, $\sigma = \$2.94$.

[D] Give a 90% confidence interval for each of the following, and then state in words exactly what your confidence interval means.

1. Forty random Brook Knoll students have an average IQ of 106. Assume the population standard deviation is 15.

2. Twenty of the students surveyed say they like having a tutorial period, and eight say they don't.

3. A sample of 8 adult male reindeer had weights (in kg) of 158, 161, 166, 170, 180, 170, 171, and 159.

[E] Bonus.

1. A NULL HYPOTHESIS can be that μ equals a specified value. Given a null hypothesis is true, the confidence level is the probability that a random \bar{x} will fall into the confidence interval centered around μ . But if data are collected and \bar{x} does not actually fall into this confidence interval, then this indicates that the real μ is actually higher or lower than what was presumed, and we say that we reject the null hypothesis.

a) O'Brien Bakery claims that their cupcakes average 260 calories each. What is the null hypothesis in this situation?

b) Travis tests the calorie content in 60 of the cupcakes and finds $s = 25.0$. Make a 95% confidence interval centered around 260.

c) Travis's sample mean is $\bar{x} = 271$. Does he reject the null hypothesis?

d) Interpret your answer to (c) by discussing the population mean number of calories per cupcake.

Name:

Statistics

Date:

Review 7 Version C

[A] Circle whether each statement is true or false.

- T F 1. $z_0 = 1.28$ is a critical value.
- T F 2. The width of a confidence interval is $2E$.
- T F 3. The t distribution is never used for proportions.
- T F 4. For a given confidence level, t_0 is smaller than z_0 .
- T F 5. The t distribution is used for means when σ is unknown.
- T F 6. In the media, margins of error refer to 90% confidence intervals.
- T F 7. t is the number of standard deviations a value is from the mean.
- T F 8. As degrees of freedom increases, the t distribution approaches the z distribution.

[B] Correct each error.

1. Jordan asks 16 small business owners whether or not they feel tax rates for businesses are too high. Twelve say yes. Give a 90% confidence interval.

$$E = 1.753(\sqrt{(12/16)(4/16)})/16 = .19$$

$$56\% > \hat{p} > 94\%$$

We are 90% confident that between 56% and 94% of the small business owners surveyed feel tax rates for business are too high.

[C] Calculate the sample size needed to achieve the given margin of error for a 99% confidence interval.

1. "Have you ever ridden a motorcycle?" $E = 2.5\%$

2. "How much do you make per hour?" $E = \$0.25$, $\sigma = \$1.40$.

[D] Give a 75% confidence interval for each of the following, and then state in words exactly what your confidence interval means.

1. Two hundred random Brook Knoll students have an average IQ of 97. Assume the population standard deviation is 15.

2. Sixty of the students surveyed say they like having a tutorial period, and nine say they don't.

3. A sample of 9 adult male reindeer had weights (in kg) of 161, 165, 166, 180, 160, 177, 172, 177, and 168.

[E] Bonus.

1. A NULL HYPOTHESIS can be that μ equals a specified value. Given a null hypothesis is true, the confidence level is the probability that a random \bar{x} will fall into the confidence interval centered around μ . But if data are collected and \bar{x} does not actually fall into this confidence interval then this indicates that the real μ is actually higher or lower than what was presumed, and we say that we reject the null hypothesis.

a) O'Brien Bakery claims that their cupcakes average 260 calories each. What is the null hypothesis in this situation?

b) Travis tests the calorie content in 40 of the cupcakes and finds $s = 25.0$. Make a 95% confidence interval centered around 260.

c) Travis's sample mean is $\bar{x} = 271$. Does he reject the null hypothesis?

d) Interpret your answer to (c) by discussing the population mean number of calories per cupcake.

Name:

Statistics

Date:

Review 7 Version D

[A] Circle whether each statement is true or false.

- T F 1. $z_0 = 1.28$ is a critical value.
- T F 2. The width of a confidence interval is $2E$.
- T F 3. The t distribution is never used for proportions.
- T F 4. For a given confidence level, t_0 is smaller than z_0 .
- T F 5. The t distribution is used for means when σ is unknown.
- T F 6. In the media, margins of error refer to 90% confidence intervals.
- T F 7. t is the number of standard deviations a value is from the mean.
- T F 8. As degrees of freedom increases, the t distribution approaches the z distribution.

[B] Correct each error.

1. Jordan asks 16 small business owners whether or not they feel tax rates for businesses are too high. Twelve say yes. Give a 90% confidence interval.

$$E = 1.753(\sqrt{(12/16)(4/16)})/16 = .19$$

$$56\% > \hat{p} > 94\%$$

We are 90% confident that between 56% and 94% of the small business owners surveyed feel tax rates for business are too high.

[C] Calculate the sample size needed to achieve the given margin of error for a 75% confidence interval.

1. "Have you ever ridden a motorcycle?" $E = 0.5\%$

2. "How much do you make per hour?" $E = \$0.75$, $\sigma = \$2.94$.

[D] Give a 99% confidence interval for each of the following, and then state in words exactly what your confidence interval means.

1. Eighty random Brook Knoll students have an average IQ of 110. Assume the population standard deviation is 15.

2. Eighteen of the students surveyed say they like having a tutorial period, and ten say they don't.

3. A sample of 10 adult male reindeer had weights (in kg) of 159, 182, 160, 155, 153, 160, 180, 166, 164, and 169.

[E] Bonus.

1. A NULL HYPOTHESIS can be that μ equals a specified value. Given a null hypothesis is true, the confidence level is the probability that a random \bar{x} will fall into the confidence interval centered around μ . But if data are collected and \bar{x} does not actually fall into this confidence interval, then this indicates that the real μ is actually higher or lower than what was presumed, and we say that we reject the null hypothesis.

a) O'Brien Bakery claims that their cupcakes average 260 calories each. What is the null hypothesis in this situation?

b) Travis tests the calorie content in 20 of the cupcakes and finds $s = 25.0$. Make a 95% confidence interval centered around 260.

c) Travis's sample mean is $\bar{x} = 271$. Does he reject the null hypothesis?

d) Interpret your answer to (c) by discussing the population mean number of calories per cupcake.