There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Compute the mean number of pairs of shoes. In this case $\bar{x} = 30.35$.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There are 2 solutions for this exercise.
Please see your textbook for the exercise prompt.

Cynthia He

5.0

Solution

On a graphing calculator, insert the values given into List 1.

Go to STAT → CALC → 1-Var Stats

The standard deviation is $s_x = 13.879$, but since it's looking for the variance, you need to square it.

$$13.879^2 = 192.63$$

$$s_x^2 = 192.63$$

0
Comments

Have a comment? Type it here ...

There are 2 solutions for this exercise.
Please see your textbook for the exercise prompt.

Cynthia He

5.0

Solution

$$\frac{36}{50} = 0.72$$

$$0.72$$

0
Comments

Have a comment? Type it here ...

Submit

There are 2 solutions for this exercise.
Please see your textbook for the exercise prompt.

Cynthia He

5.0

Solution

$$\frac{19}{172} = 0.11$$

$$0.11$$

0
Comments

Have a comment? Type it here ...

Submit

There are 2 solutions for this exercise.
Please see your textbook for the exercise prompt.

Cynthia He

5.0

Solution

The Central Limit Theorem (CLT) states that, given certain conditions, the arithmetic mean of a sufficiently large number of iterates of independent random variables, each with a well-defined expected value and well-defined variance, will be approximately normally distributed.

The center is the mean.

The spread is the standard deviation.

The shape is approximately Normal given by the Central Limit Theorem. The center is 280. The spread is 2.07.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

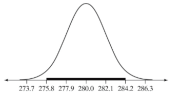
LittleTurtle

5.0

Solution

The mean is 280. One standard deviation from the mean: 277.9

and 282.1; two standard deviations from the mean: 275.8 and 284.2; and three standard deviations from the mean: 273.7 and 286.3.



See explanation for result.

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

2 standard deviations; $m = 4.2$.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

About 95% (by the 68-95-99.7 rule).

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

The sampling distribution of $\bar{x}$ is approximately Normal with mean $\mu_{\bar{x}} = \mu$ and standard deviation $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{0.4}{\sqrt{50}} = 0.0566$.

See explanation for result.

0
Comments

Have a comment? Type it here ...

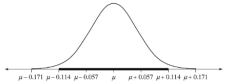
Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

The mean is μ. One standard deviation from the mean:
$\mu - 0.0566$ and $\mu + 0.0566$; two standard deviations from the mean: $\mu - 0.1132$ and $\mu + 0.1132$; and three standard deviations from the mean: $\mu - 0.1698$ and $\mu + 0.1698$.



See explanation for result.

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

2 standard deviations; $m = 0.1132$.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

About 95% (by the 68-95-99.7 rule).

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

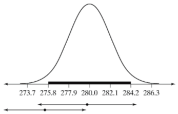
There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

3.7

Solution

The sketch is given below. Both will have the same length, but the interval with the value of $\bar{x}$ in the shaded region will contain the true population mean, while the other will not.



See explanation for result.

0
Comments

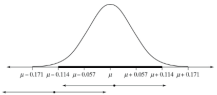
There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

The sketch is given below. Both will have the same length, but the interval with the value of $\bar{x}$ in the shaded region will contain the true population mean, while the other will not.



See explanation for result.

0
Comments

Have a comment? Type it here

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

The figure shows that 4 of the 25 confidence intervals did not contain the true parameter. This amounts to 16%. Therefore 84% of the intervals actually did contain the true parameter which suggests that these were 80% intervals (though they could have been 90%).

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

The figure shows that all of the 25 confidence intervals did contain the true mean. This suggests that the confidence level was quite high – probably 99%, but possibly 95%.

See explanation for result.

0
Comments

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

If we were to repeat the sampling procedure many times, on average, the sample proportion would be within 3 percentage points of the true proportion in 95% of samples.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

The 95% confidence
interval is 0.63 to 0.69. We are 95% confident that the interval from 0.63 to 0.69 captures the true proportion of those who favor an amendment to the Constitution that would permit organized prayer in public schools.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

If we were to repeat the sampling procedure many times, about 95% of the confidence intervals computed would contain the true proportion of those who favor an amendment to the Constitution that would permit organized prayer in public schools.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

If we were to repeat the sampling procedure many times, on average, the sample proportion would be within 3 percentage points of the true proportion in 95% of samples.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

The 95% confidence
interval is 0.56 to 0.62. We are 95% confident that the interval from 0.52 to 0.62 caputres the true proportion of those who would like to lose weight.

See explanation for result.

0
Comments

Have a comment? Type it here ...

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

If we were to repeat the sampling procedure
many times, about 95% of the confidence intervals computed would contain the true proportion of those who would like to lose weight.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

Some of the practical difficulties would include non-response (those who either do not answer the phone or those who refuse to answer) and undercoverage of those who do not have telephones. Also, the description says that the random numbers formed were for "residential numbers" which suggests that they did not include cell phones so they would have undercoverage of those people who only have cell phones.

See explanation for result.

0
Comments

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

There could be sources of error due to many sampling issues such as undercoverage (if calls were only made on certain days or time of day) and non-response bias (many people will not participate in telephone or mail-in surveys).

See explanation for result.

0
Comments

Have a comment? Type it here ...

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

2.0

Solution

We are 95% confident that the interval from 10.9 to 26.5 captures the true difference in the average number of pairs of shoes owned by girls and boys (girls – boys). That is, we are 95% confident that, on average, girls own between 10.9 and 26.5 more pairs of shoes than boys. When we say 95% confident, we mean that if this sampling method were employed many times, approximately 95% of the resulting confidence intervals would capture the true difference between the average number of pairs of shoes owned by girls and boys.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

We are 95% confident that the interval from 0.120 to 0.297 captures the true difference in the proportions of younger teens and older teens who include false information on their profiles (younger – older). That is, we are 95% confident that between 12% and 29.7% more younger teens publish false information on their profiles than older teens. When we say 95% confident, we mean that if this sampling method were employed many times, approximately 95% of the resulting confidence intervals would capture the true difference between the proportions of younger teens and older teens who include false information on their profiles.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

3.0

Solution

Incorrect; the interval refers to the mean BMI of all women, not to individual BMI's which will be much more variable.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

This is not quite correct, although it is closer than the explanation given in part (a). 95% of future samples will be within ±0.6 of the *true mean* not within ±0.6 of 26.8 (unless it happens that the true mean is 26.8). That is, future samples will not necessarily be close to the results of this sample; instead, they should be close to the *truth*.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

Correct; we have given an interval which we believe contains the true mean. Therefore, the values in that interval are values which are believable as being that true mean.

See explanation for result.

0
Comments

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

Incorrect: it suggests that the population mean will be different in some samples (in 5% of samples it will not be between 26.2 and 27.47). The population mean always stays the same, regardless of the sample taken.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

Incorrect: we are reasonably sure that the population mean is between 26.2 and 27.4, but that does not rule out any other possibility absolutely.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 3.0

Solution

Incorrect; the probability is either 0 or 1, but we don't know which.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Incorrect; the general form of these confidence intervals is $\bar{x} \pm m$, so $\bar{x}$ will always be in the center of the confidence interval.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Correct.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Incorrect; there is nothing magic about the interval from this one sample. Our method for computing confidence intervals is based on capturing the mean of the population, not a particular interval from one sample.

See explanation for result.

0
Comments

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Correct interpretation.

See explanation for result.

0
Comments

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

The data must be random so that we can generalize our results to a larger population (sampling) or make inferences about cause-and-effect (experiment). We need Normality so that we know the sampling distribution of the statistic which, in turn, leads to the computation of the confidence interval. Finally, we need independence for calculating the appropriate standard deviations

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

The data were not randomly collected; they come from a voluntary response sample. Those who respond to such online polls tend to be those with strong opinions about the issue at hand, and so are not representative of the population of interest. Since the data are not random, the confidence interval cannot be generalized to any larger group, rendering it basically useless.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

Answer: b

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 2.8

Solution

Answer: e

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 3.0

Solution

Answer.c

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Answer:b

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

This was an observational study. There was no treatment imposed on the pregnant women, but rather they measured, after the fact, the amount of exposure to magnetic fields.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

No; we can only
conclude that there is not enough evidence in this sample that living near power lines is related to whether children develop cancer. We cannot make any conclusions about cause and effect since it was not an experiment.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

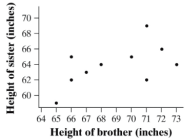
There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

A scatterplot shows a very weak, positive association between the two heights.



See explanation for result.

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

Let y = sister's height and x = brother's height. The least squares regression line is $\hat{y} = 27.64 + 0.5270x$. The slope indicates that we predict the sister's height will increase on average by 0.527 inches for every 1-inch increase in the brother's height.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

Tonya's predicted height is $\hat{y} = 27.64 + 0.5270(70) = 64.53$ inches.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

No. and the association between these variables is fairly weak ($r^2 = 0.311$). Only 31.1% of the variability in the heights of sisters is explained by the linear regression line using brother's height as the explanatory variable.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There are 2 solutions for this exercise.
Please see your textbook for the exercise prompt.

Cynthia He

5.0

Solution

Random: met because Latoya selected an SRS of students.

10%: not met because the sample size (50) is more than 10% of the population of seniors in the dormitory (175).

Large Counts: met because $np = 14 \geq 10$ and $n(1-p) = 36 \geq 10$

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

The conditions are met here. Random: the sample was a SRS. Normal: there were 38 successes (think tuition is too high) and 12 failures (do not think tuition is too high), both of which are greater than 10. Independent: the sample size (50) was less than 10% of the population size (2400).

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

The conditions are not met here. Random: We do not know how the people were contacted. It may be that this condition is not met, but we are not sure. Normal: Since 0.2% of the sample were successes, this means that only 5 were successes. This is not at least 10. Independent: this condition is met. 2673 is less than 10% of all adult heterosexuals.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 3.0

Solution

The conditions are not met here. Specifically, the Normal condition has not been met because there were only 9 successes and we need at least 10.

See explanation for result.

0
Comments

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Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Since $\frac{1-0.98}{2} = 0.01$, z^* for a 98% confidence interval can be found by looking for a left-tail area of $1 - 0.01 = 0.99$. The closest area is 0.9901 corresponding to a critical value of 2.33.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

Since $\frac{1-0.93}{2} = 0.035$, z^* for a 98% confidence interval can be found by looking for a left-tail area of $1-0.035 = 0.965$. The closest area is 0.9649 corresponding to a critical value of 1.81.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

The population of interest consists of the seniors at Tonya's high school. The parameter of interest is the true proportion who plan to attend the prom.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Random: the sample is a simple random sample. Normal: there are 36 successes (plan to attend the prom) and 14 failures (do not plan to attend the prom). Both of these numbers are at least 10. Independent: the sample (50) consists of less than 10% of the population (750). The conditions are all met.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

For a 90% confidence interval $z^* = 1.645$. For this sample $\hat{p} = \frac{36}{50} = 0.72$. So the confidence interval is $0.72 \pm 1.645\sqrt{\frac{0.72(0.28)}{50}} = 0.72 \pm 0.10$. The confidence interval, therefore, is from 0.62 to 0.82.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

Ex. 33d

Go to Page: 496 Go

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

We are 90% confident that the interval from 0.62 to 0.82 captures the true proportion of seniors who plan to attend the prom.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 4.0

Solution

The population of interest consists of the undergraduates at a large university. The parameter of interest is the true proportion who would be willing to report cheating.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Random: the sample was a simple random sample. Normal: there were 19 successes (willing to report) and 153 failures (not willing to report). Both of these numbers are at least 10. Independent: since this is a large university, 172 should be less than 10% of the undergraduate student population.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

For a 99% confidence interval $z^* = 2.576$.

For this sample $\hat{p} = \frac{19}{172} = 0.11$. So the confidence interval is $0.11 \pm 2.576\sqrt{\frac{0.11(0.89)}{172}} = 0.11 \pm 0.06$.

The confidence interval, therefore, is from 0.05 to 0.17.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

We are 99% confident that the interval from
0.05 to 0.17 captures the true proportion of students who would be willing to report cheating.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 3.0

Solution

State: We want to estimate the actual proportion of all college students who are abstainers at a 99% confidence level. *Plan*: We should use a one-sample z-interval for p if the conditions are satisfied. Random: the students were selected randomly. Normal: there were 2,105 successes (abstainers) and 8,799 failures (non-abstainers). Both are at least 10. Independent: the sample is less than 10% of the population of all college students. The conditions are met. *Do*: A 99% confidence interval is given by

$0.193 \pm 2.576\sqrt{\frac{0.193(0.807)}{10904}} = 0.193 \pm 0.01$. The confidence interval, therefore, is from 0.183 to 0.203.

Conclude: We are 99% confident that the interval from 0.183 to 0.203 captures the true propotion of U.S. college students who are abstainers.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

The value 25% does not appear in our 99% confidence interval.
While it is certainly possible that 25% are abstainers, it is not very likely. We are quite confident that it is less than that – somewhere between 18.3% and 20.3%.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.

Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

State: We want to estimate the actual proportion of all teens who have a photo of themselves on their online profiles at a 95% confidence level. *Plan*: We should use a one-sample z-interval for p if the conditions are satisfied. Random: the teens were selected randomly. Normal: there were 385 successes (teens with photos on profile) and 102 failures (teens without photos on profile). Both are at least 10. Independent: the sample is less than 10% of the population of all American teens. The conditions are met. *Do*: A 95% confidence interval is given by $0.791 \pm 1.96\sqrt{\frac{0.791(0.209)}{487}} = 0.791 \pm 0.036$. The confidence interval, therefore, is from 0.755 to 0.827. *Conclude*: We are 95% confident that the interval from 0.755 to 0.827 captures the true proportion of teens who have online profiles that have a photo of themselves on their profile.

See explanation for result.

There is 1 solution for this exercise.

Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

The value 75% does not appear in our 95% confidence interval. While it is certainly possible that 75% have photos, it is not very likely. We are reasonably confident that it is more than that – somewhere between 75.5% and 82.7%.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

The margin of error will not include, as a source of error, whether the students told the truth in the survey or not. When questions about personal behavior involving alcohol or drugs are asked, there is always a concern about the answers being truthful.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

There could be sources of error due to many sampling issues such as undercoverage (if calls were only made on certain days or time of day) and non-response bias (many people will not participate in telephone or mail-in surveys).

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

State: We want to estimate the actual proportion of all students taking the SAT twice who use coaching at a 99% confidence level. *Plan*: We should use a one-sample z-interval for p if the conditions are satisfied. Random: the students were selected randomly. Normal: there were 427 successes (students who used coaching) and 2733 failures (students who didn't use coaching). Both are at least 10. Independent: the sample is less than 10% of the population of all students taking the SAT twice. The conditions are met. *Do*: A 99% confidence interval is given by

$$0.135 \pm 2.576\sqrt{\frac{0.135(0.865)}{3160}} = 0.135 \pm 0.016.$$ The confidence interval, therefore, is from 0.119 to 0.151.

Conclude: We are 99% confident that the interval from 0.119 to 0.151 captures the true proportion of students taking the SAT twice who receive coaching.

See explanation for result.

0
Comments

Have a comment? Type it here ...

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

State: We want to estimate the actual proportion of all adults who are satisfied with the way things are going in the United States at this time at a 90% confidence level. *Plan*: We should use a one-sample z-interval for p if the conditions are satisfied. Random: the adults were selected randomly. Normal: there were 256 successes (adults who were satisfied) and 769 failures (adults who were not satisfied). Both are at least 10. Independent: the sample is less than 10% of the population of all adults. The conditions are met. *Do*: A 90% confidence interval is given by $0.25 \pm 1.645\sqrt{\frac{0.25(0.75)}{1025}} = 0.25 \pm 0.02$. The confidence interval, therefore, is from 0.23 to 0.27. *Conclude*: We are 90% confident that the interval from 0.23 to 0.27 captures the true proportion of adults who are satisfied with the way things are going in the United States at this time.

See explanation for result.

0
Comments

Have a comment? Type it here ...

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

No, the data are not based on an SRS, and therefore inference procedures are not reliable in this case.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

No. Not only is the margin of error suspect, but a voluntary response sample is typically biased as well.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

We do not know the sample sizes for the men and for the women.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

The margin of error for
women alone would be greater than 0.03 because the sample size for women alone is smaller than 1019.

See explanation for result.

1 Comment

Maleek Mayers 1yr
How does the sample size determine the margin of error?

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

Our guess is $p^* = 0.75$, so we need $1.645\sqrt{\frac{0.75(0.25)}{n}} \le 0.04$ or $n \ge \left(\frac{1.645}{0.04}\right)^2 (0.75)(0.25) = 317.11$. Take an SRS of $n = 318$ Americans with at least one Italian grandparent.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

If we use $p^* = 0.5$ instead we get $n \geq \left(\frac{1.645}{0.04}\right)^2 (0.5)(0.5) = 422.82$. Under this scenario take an SRS of n = 423 Americans with at least one Italian grandparent. Notice that in this case the sample size needed is larger because the value of p^* was 0.5. The sample sizes differ by 105.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

To meet the specifications, we need $2.576\sqrt{\frac{0.44(0.56)}{n}} \le 0.03$ or

$n \ge \left(\frac{2.576}{0.03}\right)^2 (0.44)(0.56) = 1816.73$. Take a sample of n = 1817 adults.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

With the conservative guess, we need $n \geq \left(\frac{2.576}{0.03}\right)^2 (0.5)(0.5) = 1843.27$ or 1844 adults. The conservative approach requires 27 more adults.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 3.0

Solution

Since we do not have a best guess for p, we will need to use $p^* = 0.5$. To meet the specifications, we need $1.96\sqrt{\frac{0.5(0.5)}{n}} \le 0.03$ or $n \ge \left(\frac{1.96}{0.03}\right)^2 (0.5)(0.5) = 1067.11$. Take an SRS of n = 1068 registered voters in the city.

See explanation for result.

2 Comments

Maleek Mayers 1 yr
Where does the 1.96 come from?

Purestlight 1 wk
Z score of 95% confidence level. Can be found on a T table with the infinity.

Have a comment? Type it here ...

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Our guess is $p^* = 0.7$, so we need $1.645\sqrt{\frac{0.7(0.3)}{n}} \le 0.04$ or $n \ge \left(\frac{1.645}{0.04}\right)^2 (0.7)(0.3) = 355.17$.

Take an SRS of $n = 356$ students.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

1.0

Solution

The margin of error is stated to be 0.03 and the sample proportion is $\hat{p} = 0.64$. We know that the margin of error is $z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$ so filling in what we know gives $0.03 = z^* \sqrt{\frac{0.64(0.36)}{1028}}$. When we solve this for z^* we get 2.00. This is close to the typical 1.96 used for a 95% interval and is different only because of roundoff error. The confidence level is likely 95%.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

Teens are hard to reach and
often unwilling to participate in surveys, so nonresponse bias is a major "practical difficulty" for this type of poll. Teens can also be sensitive so response bias associated with the wording of the question or the verbal emphasis by the interviewer may be a problem.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

The margin of error is stated to be 0.01 and the sample proportion is $\hat{p} = \frac{3547}{5594} = 0.6341$. We know that the margin of error is $z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$ so filling in what we know gives $0.01 = z^* \sqrt{\frac{0.6341(0.3659)}{5594}}$. When we solve this for z^* we get 1.55. The area between -1.55 and 1.55 under the Standard Normal curve is 0.8788. The confidence level is likely 88%.

See explanation for result.

0
Comments

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

We do not know if those who *did* respond can reliably represent those who did not.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Answer: a

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

Ex. 50

Go to Page: 498 Go

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 3.5

Solution

Answer: d

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Answer: c

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

Answer: a

See explanation for result.

0
Comments

Have a comment? Type it here ...

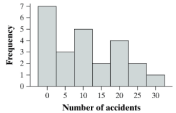
Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 1.0

Solution

A histogram of the number of accidents per hour is given below.



See explanation for result.

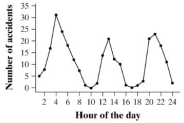
0
Comments

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

A time plot of the number of accidents is given below.



See explanation for result.

0
Comments

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

The histogram in part (a) shows that the number of accidents has a distribution that is skewed to the right.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

The time plot in (b) shows that there is a cyclical nature to the number of accidents. It looks like there are three shifts and that there are relatively few accidents when the shifts change, but the number of accidents increases over the shift.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

Based on the time plot in Exercise 8.53(b), it does look like there are more accidents right in the middle of the midnight to 8:00 am shift than the 4:00 pm to midnight shift. But the rest of the time during the two shifts, the number of accidents is relatively similar.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

The margin of error is defined to be $1 \le z^* \frac{\sigma}{\sqrt{n}}$. We are told that $\sigma = 7.5$ and for 99% confidence $z^* = 2.576$. Putting those numbers into the equation for the margin of error we get $1 \le 2.576 \frac{7.5}{\sqrt{n}}$. Solving this for n gives $n \ge 373.26$ so take a sample of 374 women.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

1.0

Solution

The margin of error is defined to be $2 \le z^* \frac{\sigma}{\sqrt{n}}$. We are told that $\sigma = 50$ and for 95% confidence $z^* = 1.96$. Putting those numbers into the equation for the margin of error we get $2 \le 1.96 \frac{50}{\sqrt{n}}$. Solving this for n gives $n \ge 2401$ so take a sample of 2401 students who took the SAT a second time.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 2.5

Solution

$df = 9,\ t^* = 2.262$

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.

Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

$df = 19,\ t^* = 2.861$

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.

Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

$df = 11,\ t^* = 1.796$

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.

Please see your textbook for the exercise prompt.

LittleTurtle

3.0

Solution

$df = 29,\ t^* = 2.045$

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There are 2 solutions for this exercise.
Please see your textbook for the exercise prompt.

zstevens

4.7

Solution

$$SE = \frac{s_x}{\sqrt{n}}$$

$$SE = \frac{9.3}{\sqrt{27}} \approx 1.789$$

Recall the formula for standard error.

Note: s = sample standard deviation and n = size of the sample.

Interpret

In repeated sampling the average distance between the sample means and the population mean is approximately 1.789

See explanation

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

$SEM = \frac{21.88}{\sqrt{20}} = 4.8925$. In repeated sampling, the average distance between the sample means and the population mean will be about 4.8925 minutes.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

Since $SEM = 19.03 = \frac{s}{\sqrt{n}} = \frac{s}{\sqrt{23}}$ we can solve for $s = 19.03\sqrt{23} = 91.26$

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

This interval is

not a confidence interval because it has no t as part of the calculation. This means that it does not take into consideration the shape of the distribution of the sample means.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

Since $SEM = 45 = \frac{s}{\sqrt{n}} = \frac{s}{\sqrt{12}}$ we can solve for $s = 45\sqrt{12} = 155.88$

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

This interval is not a confidence interval because it has no t^* as part of the calculation. This means that it does not take into consideration the shape of the distribution of the sample means.

See explanation for result.

0 Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

224049 3.2

Solution

State

Given in the stem.

Plan

One-sample t interval for μ.
Random: The data comes from a random sample.
Normal: The histogram does not show any strong skewness or outliers, so this condition is met.
Independent: We have less than 10% of the possible records for mpg

Do

18.48 ± 2.093(3.116/sqrt(20))
(17.022,19.938)

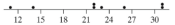
There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

4.2

Solution

State: We want to estimate the true mean amount of vitamin C μ in the CSB from this production run at the 95% confidence level. *Plan*: We should construct a one-sample t-interval for μ if the conditions are met. Random: The data come from a random sample. Normal: There are only 8 measurements so we must check the shape. The dotplot does not show any strong skewness or outliers so this condition is met. Independent: We have less than 10% of the possible samples from this production run. The conditions are met.



Vitamin C (mg/100 g)

Do: From the data we find that $\bar{x} = 22.5$ and $s = 7.19$ and we have a sample of $n = 8$ observations. This mean that we have 7 degrees of freedom and $t^* = 2.365$. The confidence interval, then, is

$22.5 \pm 2.365\left(\frac{7.19}{\sqrt{8}}\right) = 22.5 \pm 6.01 = (16.49, 28.51)$. *Conclude*: We are 95% confident that the interval from 16.49 to 28.52 mg/100 g captures the true mean amount of vitamin C in this production run.

See explanation for result.

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 1.0

Solution

Since 57 degrees of freedom is not in the table, we use 50 df and $t^* = 2.678$. Using technology with the exact degrees of freedom we find $t^* = 2.665$. If we are able to use the exact degrees of freedom we will have a slightly shorter interval with the same level of confidence.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

Since 76 degrees of freedom is not in the table, we use 60 df and $t^* = 1.671$. Using technology with the exact degrees of freedom we find $t^* = 1.665$. If we are able to use the exact degrees of freedom we will have a slightly shorter interval with the same level of confidence.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

State: We want to estimate the true mean percent change in BMC μ in the population at the 99% confidence level. *Plan*: We should construct a one-sample t-interval for μ if the conditions are met. Random: The data come from a random sample. Normal: We have a sample size that is larger than 30. Independent: We have data from less than 10% of nursing mothers. The conditions are met. *Do*: We are told that $\bar{x} = -3.587$ and $s = 2.506$ and we have a sample of $n = 47$ observations. This mean that we have 46 df and $t^* = 2.704$ from Table B (with 40 df). The confidence interval, then, is $-3.587 \pm 2.704\left(\frac{2.506}{\sqrt{47}}\right) = -3.587 \pm 0.988 = (-4.575, -2.599)$. Using technology, the confidence interval is (-4.459,-2.605). *Conclude*: We are 99% confident that the interval from -4.575 to -2.599 captures the true mean percent change in BMC.

See explanation for result.

1 Comment

cobith18 6 days
real interval is -4.469 to -2.605

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

Yes. The interval includes only negative numbers which represent bone mineral loss, so we are quite confident that nursing mothers lose bone mineral.

See explanation for result.

0 Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.

Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

State: We want to estimate the true mean HAV angle μ in the population of all such patients at the 90% confidence level. *Plan*: We should construct a one-sample t-interval for μ if the conditions are met. Random: The data come from a random sample. Normal: The sample size is less than 30 but we are told that there are no large outliers or strong skewness. Independent: We must assume that we have data fro less than 10% of patients under the age of 21 who came to a medical center for surgery to correct HAV. Conditions are met. *Do:* We are told that $\bar{x} = 24.76$ and $s = 6.34$ and we have a sample of $n = 21$ observations. This mean that we have 20 df and $t^* = 1.725$. The confidence interval, then, is $24.76 \pm 1.725\left(\frac{6.34}{\sqrt{21}}\right) = 24.76 \pm 2.39 = (22.37, 27.15)$. *Conclude:* We are 90% confident that the interval from 22.37 to 27.15 degrees captures the true mean HAV angle.

See explanation for result.

0

Comments

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

Adding back the outlier would
increase both the mean and the standard deviation. It would also make the t-distribution inappropriate so
the confidence interval would have no meaning.

See explanation for result.

0
Comments

Have a comment? Type it here ...

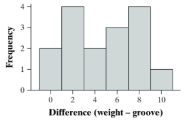
Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

State: We want to estimate the true mean difference μ in the estimates from these two methods in the population of tires at the 95% confidence level. *Plan*: We should construct a one-sample t-interval for μ if the conditions are met. Random: The data come from a random sample. Normal: After we calculate the differences (we used weight – groove) we plot a histogram of those differences. The graph (below) indicates that there is no strong skewness or outliers. Independent: We have data from less than 10% of tires. The conditions are met



Do: We compute from the differences that $\bar{x} = 4.556$ and $s = 3.226$ and we have a sample of $n = 16$ observations. This mean that we have 15 df and $t^* = 2.131$. The confidence interval, then, is
$\left(3.226\right)$

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

Since the entire interval is positive, and we measured weight – groove, we are reasonably sure that the measurement by the weight method is giving larger numbers than the measurement by the groove method, on average.

See explanation for result.

0
Comments

Have a comment? Type it here ...

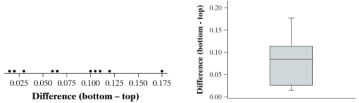
Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

State: We want to estimate the true mean difference μ in the amount of zinc in the top and the bottom of wells in this large region at the 95% confidence level. *Plan*: We should construct a one-sample t-interval for μ if the conditions are met. Random: The data come from a random sample. Normal: After we calculated the differences (we used bottom - top) we constructed a dotplot of those differences which indicates that there is no strong skewness but we might have an outlier at 0.175. So we also created a boxplot to check to see if it is an outlier or not. The boxplot (below right) shows that the point in question is not an outlier. Independent: We have data from less than 10% of wells. Conditions are met.



Do: We compute from the differences that $\bar{x} = 0.0804$ and $s = 0.0523$ and we have a sample of $n = 10$ observations. This mean that we have 9 df and $t^* = 2.262$. The confidence interval, then, is

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

Since the entire interval is positive, and we measured bottom – top, we are reasonably sure that, on average, the amount of zinc at the bottom of the wells is greater than the amount of zinc at the top of the wells.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

The t-procedure is only valid if the original measurements follow a Normal distribution (or are at least approximately Normally distributed). In this case there are far too many outliers with only 20 measurements for us to think the Normal distribution is plausible.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

The t-procedure is only valid if the original measurements follow a Normal distribution (or are at least approximately Normally distributed). In this case there are strong outliers and 28 observations. The sample data are too far from a Normal distribution to comfortably assume that the population values come from a Normal distribution.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

A t-procedure would not be appropriate here because we are trying to estimate a population proportion, not a population mean.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

The t-procedure would not be appropriate here because the sample (male athletes) is not representative of the whole population (all male college students at this school). The sample was not selected randomly.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

The t-procedure would not be appropriate here because there are too many outliers with only 25 observations. We cannot assume that the population values can be described by a Normal distribution.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

The t-procedure is not appropriate here because we have measurements on the entire population.
We do not need to estimate the population mean – we can calculate it.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

The t-procedure is not appropriate here because the sample (members of the AP statistics class) may not be representative of the population of students. The sample was not selected randomly.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

The t-procedure is appropriate here, but only for estimating the mean word length in the entire article, not the whole journal, because the sample was selected only from the article. Random: The words were selected at random. Normal: The sample size was 100 which is large enough to use the t-procedures. Independent: There will be more than 1000 words in a multi-page article so she has sampled less than 10% of the possible words.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

Ex. 75

Go to Page: 520 Go

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Answer: b

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

Ex. 76

Go to Page: 520 Go

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

Answer: a

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

Ex. 77

Go to Page: 520 Go

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 4.0

Solution

Answer: b

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 3.8

Solution

Answer: a

See explanation for result.

0
Comments

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

We know that the sum of the probabilities must be 1, so

$$P(X=7)=1-(P(X=0)+P(X=1)+P(X=2)+P(X=3)+P(X=4)+P(X=5)+P(X=6))$$
$$=1-(0.04+0.03+0.06+0.08+0.09+0.08+0.05)$$
$$=1-0.43=0.57$$

See explanation for result.

0 Comments

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

The mean number of days that a randomly selected young person (aged 19 to 25) watched television is 5.44.

$$\mu_X = \sum_{i=1}^{7} x_i p_i$$
$$= 0(0.04) + 1(0.03) + 2(0.06) + 3(0.08) + 4(0.09) + 5(0.08) + 6(0.05) + 7(0.57)$$
$$= 0 + 0.03 + 0.12 + 0.24 + 0.36 + 0.40 + 0.30 + 3.99$$
$$= 5.44$$

See explanation for result.

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Comments

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

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Solution

First we need to find the standard deviation for X.

$$\sigma_X = \sqrt{\sum_{i=1}^{n}(x_i - \mu_X)^2 p_i}$$
$$= \sqrt{(0-5.44)^2\,0.04 + \cdots + (7-5.44)^2\,0.57}$$
$$= \sqrt{4.5664}$$
$$= 2.14$$

We would expect the mean $\bar{x}$ of 100 randomly selected young people (aged 19 to 25) to be approximately Normally distributed with mean $\mu_{\bar{x}} = \mu_X = 5.44$ and standard deviation

$\sigma_{\bar{x}} = \frac{\sigma_X}{\sqrt{n}} = \frac{2.14}{\sqrt{100}} = 0.214$. Standardize $\bar{x} = 4.96$: $z = \frac{\bar{x} - \mu_{\bar{x}}}{\sigma_{\bar{x}}} = \frac{4.96 - 5.44}{0.214} = -2.24$

The area to the left of $z = -2.24$ is 0.0125. We would expect to see results as extreme as or more extreme than ours about 1.25% of the time. The average number of days spent watching TV seems unusually low for this group.

See explanation for result.

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

There will be 8 treatment groups, with 25 people randomized into each treatment group. The treatments are:
Treatment 1: 25% of food on sale, 60% off
Treatment 2: 50% of food on sale, 60% off
Treatment 3: 75% of food on sale, 60% off
Treatment 4: 100% of food on sale, 60% off
Treatment 5: 25% of food on sale, 40-70% off
Treatment 6: 50% of food on sale, 40-70% off
Treatment 7: 75% of food on sale, 40-70% off
Treatment 8: 100% of food on sale, 40-70% off
Researchers will compare the mean attractiveness rating given by individuals in the eight groups.

See explanation for result.

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Comments

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

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Solution

Since there are 200 subjects, we label the subjects 001, 002, ..., 200. The labels 000 and 201 to 999 are not used in this example, so we ignore them. We also ignore any repeats of a label, since that subject is already in a treatment group. Once we have 25 subjects for the first treatment, we select 25 subjects for the second treatment, and so on, until all subjects have been assigned to a treatment group. Here we pick only the first 3 subjects. The first three-digit group is 457, which we ignore. The second three-digit group is 404, which we ignore. The third three-digit group is 180, so subject 180 is the first person assigned to Treatment 1. The fourth three-digit group is 765, which we ignore. We also ignore 561 and 333 until we get to 020, which means subject 020 is in Treatment 1. We then ignore 705 and assign the subject with label 193 to Treatment 1.

See explanation for result.

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

The range "40% to 70% off" slowly decreases in attractiveness to customers as the percent of food on sale increases. However, the precise "60% off" grows increasingly attractive to customers as the percent of food on sale increases. When only 25% of food is on sale, customers rate the "40% to 70% off" range as more attractive than the precise "60% off." For all other percents of foods on sale, the precise "60% off" is more attractive to customers and becomes more and more attractive than the range "40% to 70% off" as the percent of food items on sale increases.

See explanation for result.

0
Comments

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

Random is the most important condition because it assures us that the sample is chosen in such a way that it will typically be representative of the population. This means that we can use the data to make inferences about the population (sampling) or about cause-and-effect (experiment). Otherwise we are stuck making conclusions only about the data at hand which means the confidence interval does us no good. Normality is the second most important condition because our stated confidence level will not be correct if this condition is violated. Finally, Independence is the third most important condition. Our methods of computing the standard error require independence of observations. If this condition is violated because we are sampling without replacement, the standard error we are using is actually larger than the true standard error. Note that there are other methods that can be used if either the Normal condition or the Independent condition are not met. They are not covered in this text.

See explanation for result.

0
Comments

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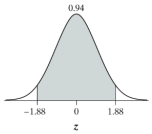
There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

2.0

Solution

To estimate a population proportion, we need a z^* and for 94% confidence, $z^* = 1.88$. To find this, note that we want a center area of 94% on the standard normal curve. The graph below shows this.



See explanation for result.

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

To estimate a population mean we need a t^* and since we have a sample size of 58, we need 57 degrees of freedom. From Table B, using 50 degrees of freedom we find $t^* = 2.678$. Using technology we get $t^* = 2.665$.

See explanation for result.

1 Comment ▲

teaspoon 1 yr
While using Table B, you should use 60 degrees of freedom to more accurately find the correct critical value for [math]t/math] which would give you... 2.660

Have a comment? Type it here ...

Submit

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

2.2

Solution

The sample mean is $\frac{430+470}{2} = 450$ minutes. The margin of error is 20 minutes, so $2.023\frac{s}{\sqrt{40}} = 20$ minutes. Thus, the standard deviation is $s_x = \frac{20\sqrt{40}}{2.023} = 62.527$ minutes.

See explanation for result.

1 Comment

AzariusMaximus 1 yr
n=30, not 40

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Ex. 3b

Go to Page: 522 Go

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

Solution

This
interpretation is incorrect. The confidence interval provided gives an interval estimate for the mean lifetime of batteries produced by this company, not individual lifetimes.

See explanation for result.

0
Comments

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 1.0

Solution

No. A confidence interval
provides a statement about an unknown population mean, not another sample mean.

See explanation for result.

0
Comments

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Ex. 3d

Go to Page: 523 Go

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 1.0

Solution

We are 95%
confident that the interval from 430 to 470 minutes captures the true mean lifetime of all AA batteries produced by this company is between 430 and 470 minutes.

See explanation for result.

0
Comments

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There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

The parameter p refers to the proportion of all adults aged 18 and older who say that football is their favorite sport to watch on television. If we take a different sample, then we will probably get a different estimate. There is variability from sample to sample.

See explanation for result.

0
Comments

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Ex. 4b

Go to Page: 523 Go

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 3.0

Solution

Random: The sample was random.

Normal: There were 370 successes (football is their favorite sport to watch) and 630 failures (football is not their favorite sport to watch) which are both at least 10. Independent: We have less than 10% of all adults in our sample.

See explanation for result.

0
Comments

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There is 1 solution for this exercise.

Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

$$0.37 \pm 1.96\sqrt{\frac{0.37(0.63)}{1000}} = (0.3401, 0.3999).$$

See explanation for result.

0
Comments

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Ex. 4d

Go to Page: 523 Go

There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle 5.0

Solution

We are 95% confident that the interval from 0.3401 to 0.3999 captures the true proportion of all adults who say football is their favorite sport to watch on television.

See explanation for result.

0 Comments

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