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

LittleTurtle

5.0

Solution

Population: people who signed a card saying that they intend to quit smoking. *Parameter of interest*: proportion of the population who signed the card saying they would not smoke who actually quit smoking. *Sample*: a random sample of 1000 people who signed the cards. *Sample statistic*: $\hat{p} = 0.21$.

See explanation for result. ...

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

LittleTurtle

5.0

Solution

Population: individuals in the US. *Parameter of interest*: proportion of the U. S. population who were unemployed. *Sample*: a random sample of individuals from 55,000 U.S. households. *Sample statistic*: $\hat{p} = 0.100$.

See explanation for result.

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

LittleTurtle

?

Solution

Population: all the turkey meat. *Parameter of interest*: minimum temperature. *Sample*: 4 randomly chosen points in the turkey. *Sample statistic*: sample minimum = 170°F.

See explanation for result.

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

LittleTurtle

5.0

Solution

Population: all gasoline stations in a large city. *Parameter of interest*: range of gas prices at the gasoline stations in the city. *Sample*: a random sample of 10 gas stations in the city. *Sample statistic*: sample range = 25 cents.

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

$\mu = 2.5003$ is a parameter (related to the population of all the ball bearings in the container) and
$\bar{x} = 2.5009$ is a statistic (related to the sample of 100 ball bearings).

See explanation for result.

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

LittleTurtle

5.0

Solution

$p = 0.41$ is a parameter (related to the population of all registered voters) and $\hat{p} = 0.33$ is a statistic (related to the sample of 250 registered voters).

See explanation for result.

0
Comments

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

LittleTurtle

?

Solution

$\hat{p} = 0.48$ is a statistic (related to the sample of 100 numbers dialed) and $p = 0.52$ is a parameter (related to the population of all residential phone numbers in Los Angeles).

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

$\bar{x} = 64.5$ inches is a statistic (related to the sample of female college students) and $\mu = 63$ inches is a parameter (related to the population of all adult American women).

See explanation for result.

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

LittleTurtle

5.0

Solution

This is not the exact sampling distribution because that would require a value of $\hat{p}$ for all possible samples of size 100. However, it is an approximation of the sampling distribution that we created through simulation.

See explanation for result.

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

LittleTurtle

5.0

Solution

The distribution is centered at 0.60 and is reasonably symmetric and bell-shaped. Values vary from about 0.47 to 0.74. The values at 0.47, 0.73 and 0.74 are outliers.

See explanation for result.

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

LittleTurtle 5.0

Solution

If we
found that only 45 students said that they did all their homework last week, we would be skeptical of the newspaper's claim that 60% of students did their homework last week. None of the simulated samples had a proportion this low.

See explanation for result.

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

LittleTurtle

5.0

Solution

This is not the exact sampling distribution because that would require a value of $\bar{x}$ for all possible samples of size 20. However, it is an approximation of the sampling distribution that we created through simulation.

See explanation for result.

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

LittleTurtle
3.7

Solution

The distribution is centered at 64 and is reasonably symmetric and bell-shaped. Values vary from about 62.4 to 65.7. There do not seem to be any outliers.

See explanation for result.

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

LittleTurtle

3.5

Solution

If we found that the sample mean was 64.7 inches, we would likely conclude that this population mean height for females at this school could be 64. In our simulation we found values of 64.7 or larger in about 10% of the samples.

See explanation for result.

0
Comments

Have a comment? Type it here ...

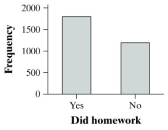
Submit

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

LittleTurtle

1.0

Solution



See explanation for result.

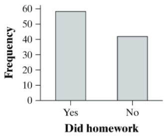
0
Comments

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

LittleTurtle
1.0

Solution

Answers will vary. An example bar graph is given.



See explanation for result.

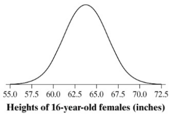
0

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

LittleTurtle

?

Solution



See explanation for result.

0
Comments

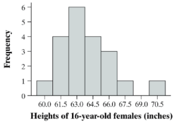
Have a comment? Type it here ...

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

LittleTurtle
1.0

Solution

Answers will vary. An example histogram 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

4.5

Solution

1

The approximate sampling distribution is skewed to the right with a center at $9(^\circ F)^2$. The values vary from about 2 to 27.5 $(^\circ F)^2$.

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
4.0

Solution

A sample variance of 25 is quite large compared with what we would expect, since only one out of 500 SRSs had a variance that high. It suggests that the manufacturer's claim is false and that the thermostat actually has more variability than claimed.

See explanation for result.

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

LittleTurtle

3.0

Solution

The approximate sampling distribution is reasonably symmetric and centered at 45.5°F. The values vary from about 39 to 50°F.

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 sample minimum of 40°F is quite low compared with what we would expect. This suggests that the manufacturer's claim is false.

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 population is the 12,000 students; the population distribution (Normal with mean 7.11 minutes and standard deviation 0.74 minutes) describes the time it takes randomly selected individuals to run a mile.

See explanation for result.

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

LittleTurtle

?

Solution

The sampling distribution (Normal with mean of 7.11 minutes and standard deviation of 0.074 minutes) describes the average mile-time for 100 randomly selected students. This is different from the population distribution in that it has a smaller standard deviation and it describes the mean of 100 mile times rather than individual mile times.

See explanation for result.

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

LittleTurtle
1.8

Solution

The population is the 4000 beads in the container. 1000 of the beads are white and 3000 are red.

See explanation for result.

2 Comments

Gouss 1 yr
this is 16

teaspoon 1 yr
Here is the answer: Since the smallest number of total tax returns is still more than 10 times the sample size, the variability of the sample proportion will be approximately the same for all states.

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

LittleTurtle

?

Solution

Yes. It will change—the sample taken from Wyoming will be about the same size, but the sample in, for example, California will be considerably larger, and therefore the variability of the sample proportion will be smaller.

See explanation for result.

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

LittleTurtle

?

Solution

A larger sample does not reduce the bias of a poll result. If the sampling technique results in bias, simply increasing the sample size will not reduce the bias.

See explanation for result.

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

LittleTurtle

?

Solution

A larger sample will reduce the variability of the result. More people means more information which means less variability.

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

Graph (c) shows an unbiased estimator because the mean of the distribution is very close to the population parameter.

See explanation for result.

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

LittleTurtle

3.0

Solution

The graph in (b) shows the statistic that does the best job at estimating the parameter. Although it is biased, the bias is small and the statistic has very little variability.

See explanation for result.

1 Comment

Prongs 4 days
I feel like B would have less bias than C
but the book agrees with this answer too. :/

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 choose many samples, the average of the $\bar{x}$-values from these samples will be close to μ. In other words, the sampling distribution of $\bar{x}$ is centered at the population mean μ we are trying to estimate.

See explanation for result.

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

LittleTurtle

?

Solution

A larger sample will give more information and, therefore, more precise results. The variability in the distribution of the sample average decreases as the sample size increases.

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

1

Answer: d

See explanation for result.

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

LittleTurtle 5.0

Solution

Answer: e

See explanation for result.

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.

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.

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

LittleTurtle

5.0

Solution

This is the same thing as asking what percent of Normal scores are more than 2.5 standard deviations below the mean. In other words, what is $P(z < -2.5)$? Using Table A, this value is 0.0062.

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 distribution for the older women, based on the standard scale for younger women, is Normal with mean -2 and standard deviation 1. So the question is asking for the probability of getting a standard score of less than -2.5. This is $P(X<-2.5)=P\left(z<\frac{-2.5-(-2)}{1}\right)=P(z<-0.5)=0.3085$. So, based on this criterion, about 31% of women aged 70-79 have osteoporosis.

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 equation for the least squares regression line is: $\hat{y} = 1.4146 + 0.4399x$ where $\hat{y}$ is the predicted average number of offspring per female and x is the index of the abundance of pine cones.

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 points in the residual plot are well scattered so this tells us that the linear model is appropriate for the data.

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

57.2% of the variation in the average number of offspring can be accounted for by the linear model relating average number of offspring to abundance of pine cones, and we expect individual predictions to be off by an average of about 0.6.

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

We would not be surprised to find 8 (32%) orange candies. From the graph in figure 7.11 there were a fair number of simulations in which there were 8 or fewer orange candies. On the other hand, there were only a couple of simulations where there were 5 (20%) or fewer so if this occurred, we should be surprised.

See explanation for result.

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

LittleTurtle

5.0

Solution

It is more surprising to get 32% orange candies in a sample of 50 than it is in a sample of 25. Comparing the graphs in figures 7.11 and 7.12, there were a fair number of simulations in 7.11 (sample size 25) with 32% or less, but very few in 7.12 (sample size 50) with 32% or less.

See explanation for result.

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

LittleTurtle

5.0

Solution

We would be surprised to find 32% orange candies in this case. Very few of the simulations with sample size 25 had 32% or more orange candies. However, we would not be surprised to find 20% orange candies. This is very near the center of the distribution.

See explanation for result.

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

LittleTurtle

5.0

Solution

We would be surprised to find 32% orange candies in either case since neither simulation had many samples with 32% or more orange candies. However, it is even rarer when the sample size is 50.

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 of the sampling distribution is the same as the population proportion so $\mu_{\hat{p}} = p = 0.45$.

See explanation for result. ...

0
Comments

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

LittleTurtle

4.5

Solution

The standard deviation of the sampling distribution is

$\sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}} = \sqrt{\frac{0.45(0.55)}{25}} = 0.0995.$ In this case the 10% condition is met because it is very likely true that there are more than 250 candies.

See explanation for result.

0
Comments

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

LittleTurtle
5.0

Solution

The sampling distribution is approximately Normal because $np = 25(0.45) = 11.25$ and $n(1-p) = 25(0.55) = 13.75$ are both at least 10.

See explanation for result.

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

LittleTurtle

5.0

Solution

If the sample size were 50 rather than 25, the sampling distribution would still be approximately Normal with mean 0.45, but the standard deviation would be $\sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}} = \sqrt{\frac{0.45(0.55)}{50}} = 0.0704$.

See explanation for result.

2 Comments

breezyanna13 1 yr
No, because the question is "If the sample size were 50 rather than 25, how would this change the sampling distribution of p?"

flyingcow143 1 mth
No, because the question is, "No, because the question is "If the sample size were 100 rather than 25, how would this change the sampling distribution of p?"

Honestly thought it's 100 not 50

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

LittleTurtle

5.0

Solution

The mean of the sampling distribution is the same as the population proportion so $\mu_{\hat{p}} = p = 0.15$.

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 standard deviation of the sampling distribution is

$\sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}} = \sqrt{\frac{0.15(0.85)}{25}} = 0.0714$. In this case the 10% condition is met because it is very likely true that there are more than 250 candies.

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 sampling distribution is not approximately Normal because $np = 25(0.15) = 3.75$ is less than 10. Note that $n(1-p) = 25(0.85) = 21.25$ is at least 10 but for the Normal approximation to be correct, both numbers must be at least 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

If the sample size were 75 rather than 25, the sampling distribution would now be approximately Normal with mean 0.15 and standard deviation $\sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}} = \sqrt{\frac{0.15(0.85)}{75}} = 0.0412$, since $np = 75(0.15) = 11.25$ and $n(1-p) = 75(0.85) = 63.75$ are both at least 10.

See explanation for result. ...

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

LittleTurtle

5.0

Solution

The 10% condition is not met here. Out of the population of 76 passengers, 10 people were screened (13%). This means that they sampled more than 10% of the 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

No. The Normal
condition is also not met since the total sample size was 10. Necessarily, both np and $n(1-p)$ will be less than 10, violating the condition for Normality.

See explanation for result.

0
Comments

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

LittleTurtle

5.0

Solution

The 10% condition is met here. We are drawing a sample of 7 out of 100 tiles. This is less than 10% of the population.

See explanation for result.

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

LittleTurtle
4.0

Solution

The Normal condition is not met here since the total sample size was 7. Necessarily, both np and $n(1-p)$ will be less than 10, violating the condition for Normality.

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 Normal condition is not met here. $np = 15(0.3) = 4.5 < 10$. *Challenge*: Let X be the number of Hispanic workers in the sample. X has an approximate binomial distribution with $n = 15$ and $p = 0.3$.

$$P(X \leq 3) = \binom{15}{0}(0.3)^{0}(1-0.3)^{15} + \cdots + \binom{15}{3}(0.3)^{3}(1-0.3)^{12} = 0.2969.$$

See explanation for result.

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

LittleTurtle

5.0

Solution

The 10% condition is not met here. The sample of 50 is more than 10% of the population (which is of size 316).

See explanation for result.

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

LittleTurtle

4.0

Solution

The mean of the sampling distribution is the same as the population proportion so it is $\mu_{\hat{p}} = p =$ 0.70.

See explanation for result.

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

LittleTurtle

5.0

Solution

The standard deviation of the sampling distribution is

$\sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}} = \sqrt{\frac{0.7(0.3)}{1012}} = 0.0144.$ The population (all U.S. adults) is clearly at least 10 times as large as the sample (the 1012 surveyed adults) so the 10% condition is 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

1

The sampling distribution is approximately Normal since $np = 1012(0.70) = 708.4$ and $n(1-p) = 1012(0.30) = 303.6$ are both at least 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

$P(\hat{p} \leq 0.67) = P(z \leq -2.08) = 0.0188$. This is a fairly unusual result if 70% of the population actually drink the cereal milk.

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 the same as the population proportion so it is $\mu_{\hat{p}} = p = 0.4$.

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 standard deviation is $\sigma_{\hat{p}} = \sqrt{\frac{0.4(0.6)}{1785}} = 0.0116$. Since the population is clearly at least 10 times bigger than the sample, the 10% condition is 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

The sampling distribution is approximately Normal since
$np = 1785(0.4) = 714$ and $n(1-p) = 1785(0.6) = 1071$ are both at least 10.

See explanation for result.

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

Ian Normile

5.0

Solution

$P(\hat{p} > .44) = P(z > 3.45) = 0.0003$. The probability of actually getting a result of 44% is highly unlikely.

see explanation for result.

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

LittleTurtle

5.0

Solution

Since the standard deviation is found by deviding by $\sqrt{n}$, using $4n$ for the sample size halves the standard deviation $\left(\sqrt{4n}=2\sqrt{n}\right)$; we would need to sample $1012(4)=4048$ 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

5.0

Solution

Since the standard deviation is found by deviding by $\sqrt{n}$, using $9n$ for the sample size halves the standard deviation $\left(\sqrt{9n} = 3\sqrt{n}\right)$; we would need to sample $9(1785) = 16,065$ adults.

See explanation for result.

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

LittleTurtle

?

Solution

State: We want to find the probability that $\hat{p}$ is at least 0.75. In symbols, that's $P(\hat{p} \geq 0.75)$. *Plan*: We have an SRS of size 267 drawn from a population in which the proportion $p = 0.70$ of college women have been on a diet within the past 12 months. This means that $\mu_{\hat{p}} = 0.70$ and since the population clearly contains more than $267(10) = 2670$ college women, $\sigma_{\hat{p}} = \sqrt{\frac{0.7(0.3)}{267}} = 0.0280$. We also check the Normal condition: $np = 267(0.7) = 186.9$ and $n(1-p) = 267(0.3) = 80.1$ are both at least 10, so the distribution of $\hat{p}$ can be approximated by a Normal distribution. *Do*: $P(\hat{p} \geq 0.75) = P\left(z \geq \frac{0.75 - 0.7}{0.0280}\right) = P(z \geq 1.79) = 0.0367$. *Conclude*: About 3.67% of all SRSs of size 267 will give a sample proportion that is 0.75 or greater.

See explanation for result.

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

LittleTurtle

5.0

Solution

State: We want to find the probability that $\hat{p}$ is at least 0.20. In symbols, that's $P(\hat{p} \geq 0.20)$. *Plan*: We will have an SRS of size 500 drawn from a population in which the proportion $p = 0.14$ of motorcycle owners own Harleys. This means that $\mu_{\hat{p}} = 0.14$ and since the population clearly contains more than $500(10) = 5000$ motorcycle owners, $\sigma_{\hat{p}} = \sqrt{\dfrac{0.14(0.86)}{500}}$. We also check the Normal condition: $np = 500(0.14) = 70$ and $n(1-p) = 500(0.86) = 430$ are both at least 10, so the distribution of $\hat{p}$ can be approximated by a Normal distribution. *Do*: $P(\hat{p} \geq 0.20) = P\left(z \geq \dfrac{0.20 - 0.14}{0.0155}\right) = P(z \geq 3.87) \approx 0$. *Conclude*: While it is possible, it is extremely unlikely that we would get a sample of 500 motorcycle owners in which at least 20% own Harleys.

See explanation for result.

0
Comments

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

LittleTurtle

5.0

Solution

State: We want to find the probability that $\hat{p}$ is at most 0.86. In symbols, that's $P(\hat{p} \le 0.86)$. *Plan*: We have an SRS of size 100 drawn from a population in which $p = 0.90$ of orders are shipped within three working days. This means that $\mu_{\hat{p}} = 0.90$ and since the population contains more than $100(10) = 1000$ orders in the last week (we are told there were 5000), $\sigma_{\hat{p}} = \sqrt{\frac{0.9(0.1)}{100}} = 0.03$. We also check the Normal condition: $np = 100(0.9) = 90$ and $n(1-p) = 100(0.1) = 10$ are both at least 10, so the distribution of $\hat{p}$ can be approximated by a Normal distribution. *Do*: $P(\hat{p} \le 0.86) = P\left(z \le \frac{0.86 - 0.9}{0.03}\right) = P(z \le -1.33) = 0.0918$. *Conclude*: There is a 9.18% chance that we would get a sample in which 86% or fewer of the orders were shipped within three working days.

See explanation for result.

0
Comments

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

LittleTurtle

?

Solution

If
the claim is correct, then we can expect to observe 86% or fewer orders shipped on time in about 9.18% of the samples of this size. Getting a sample proportion at or below 0.86 is not an unlikely event.

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 find the probability that $\hat{p}$ is at most 0.62. In symbols, that's $P(\hat{p} \le 0.62)$. *Plan*: We have an SRS of size 100 drawn from a population in which $p = 0.67$ of students support efforts to crack down on underage drinking. This means that $\mu_{\hat{p}} = 0.67$ and since the population contains more than $100(10) = 1000$ students, $\sigma_{\hat{p}} = \sqrt{\frac{0.67(0.33)}{100}} = 0.0470$. We also check the Normal condition: $np = 100(0.67) = 67$ and $n(1-p) = 100(0.33) = 33$ are both at least 10, so the distribution of $\hat{p}$ can be approximated by a Normal distribution. *Do*:
$P(\hat{p} \le 0.62) = P\left(z \le \frac{0.62 - 0.67}{0.0470}\right) = P(z \le -1.06) = 0.1446$. *Conclude*: There is a 14.46% chance that we would get a sample in which 62% or fewer of the students supported efforts to crack down on underage drinking.

See explanation for result.

0

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

LittleTurtle

5.0

Solution

Getting a sample proportion at or below 0.62 is not an unlikely event. The sample results are lower than the national percentage, but the sample was so small that such a difference could arise by chance even if the true campus proportion is the same.

See explanation for result.

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

LittleTurtle

?

Solution

1

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

Answer: c

See explanation for result.

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

LittleTurtle

3.7

Solution

Answer: b

See explanation for result.

2 Comments

Cynthia He 1 yr
How did you get b?

Mythmonger Admiralus 17 hrs
Answer is B. When the sq rt of 2 multiplies the standard deviation of a sample of 750 (Which is 0.0167), the result is 0.02366, which also happens to be the standard deviation of a sample of 375.

Have a comment? Type it here ...

Submit

Ex. 46 Go to Page: 441 Go

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

LittleTurtle

3.0

Solution

Answer: b

See explanation for result.

3 Comments

Cynthia He 1 yr
How did you get b?

None 11 mths
because you check if the 10% condition are met (np), n(1-p)

potatobun 1 mth
^ that is actually the normal condition. the 10% condition is whether it is reasonable that the sample size is less than 10% of the total population. since n*p=225 and n*(1-p)-525 and both are larger than 10, be can say the sampling distribution is approximately normal. The correct answer is n*p=225 and n*(1-p)-525; however this may be a different letter in different versions of the textbook

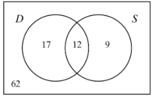
Have a comment? Type it here

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

LittleTurtle

?

Solution



62% neither download nor share music files.

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

Assign numbers 01-14 to the animals (01 to the desert tortoise, 02 to the Olive Ridley sea turtle,…, 14 to the San Francisco garter snake). Starting at line 111 in Table D, read pairs of numbers until you get three different numbers between 01 and 14. These numbers represent the animals chosen.

See explanation for result.

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

LittleTurtle

5.0

Solution

Using Table D, the animals chosen are 12, 04, and 11 which represent the blunt-nosed leopard lizard, the flat-tailed horned lizard and the Coachella Valley fringe-toed lizard.

See explanation for result.

There is 1 solution for this exercise.

Please see your textbook for the exercise prompt.

LittleTurtle

3.0

Solution

The mean is $\mu_{\bar{x}} = \mu_X = 225$ seconds, and the standard deviation is $\sigma_{\bar{x}} = \frac{\sigma_X}{\sqrt{n}} = \frac{60}{\sqrt{10}} = 18.974$ seconds. These results do not depend on the shape of the distribution of the individual play times.

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 $\mu_{\bar{x}} = \mu_x = 40.125\,\text{mm}$, and the standard deviation is $\sigma_{\bar{x}} = \frac{\sigma_x}{\sqrt{n}} = \frac{0.002}{\sqrt{4}} = 0.001\,\text{mm}$.
These results do not depend on the shape of the distribution of the individual axele diameters.

See explanation for result.

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

LittleTurtle

5.0

Solution

If we want $\sigma_{\bar{x}} = 30$, then we need to solve the following equation for n:

$30 = \frac{60}{\sqrt{n}} \to \sqrt{n} = \frac{60}{30} = 2 \to n = 4$. So we need a sample of size 4.

See explanation for result.

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

LittleTurtle

5.0

Solution

If we want $\sigma_{\bar{x}} = 0.0005$, then we need to solve the following equation for n:

$$0.0005 = \frac{0.002}{\sqrt{n}} \rightarrow \sqrt{n} = \frac{0.002}{0.0005} = 4 \rightarrow n = 16.$$ So we need a sample of size 16.

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 Normal with $\mu_{\bar{x}} = \mu_X = 188\,\text{mg/dl}$ and

$$\sigma_{\bar{x}} = \frac{\sigma_X}{\sqrt{n}} = \frac{41}{\sqrt{100}} = 4.1\,\text{mg/dl}.$$

See explanation for result.

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

LittleTurtle

5.0

Solution

$$P(185 \le \bar{x} \le 191) = P\left(\frac{185-188}{4.1} \le z \le \frac{191-188}{4.1}\right) = P(-0.73 \le z \le 0.73) = 0.7673 - 0.2327 = 0.5346$$

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

In this case $\sigma_{\bar{x}} = \frac{\sigma_X}{\sqrt{n}} = \frac{41}{\sqrt{1000}} = 1.30$ mg/dl. So now the probability becomes $P(185 \le \bar{x} \le 191) = P\left(\frac{185-188}{1.30} \le z \le \frac{191-188}{1.30}\right) = P(-2.31 \le z \le 2.31) = 0.9896 - 0.0104 = 0.9792$. The larger sample is better since it is more likely to produce a sample mean within 3 mg/dl of the 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

5.0

Solution

The sampling distribution of $\bar{x}$ is Normal with $\mu_{\bar{x}} = \mu_X = 55{,}000$ miles and

$$\sigma_{\bar{x}} = \frac{\sigma_X}{\sqrt{n}} = \frac{4500}{\sqrt{8}} = 1591 \text{ miles.}$$

See explanation for result.

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

LittleTurtle

5.0

Solution

$$P(\bar{x} < 51{,}800) = P\left(z < \frac{51{,}800 - 55{,}000}{1591}\right) = P(z < -2.01) = 0.0222$$

Getting a sample mean this low would be a surprising result if the company's claim was true. Thus, I would doubt the company's claim.

See explanation for result.

0
Comments

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

zoeprecalc

5.0

Solution

$P(\bar{x} < 295)$

$$Z = \frac{295-298}{3} = -1$$

$P(Z < -1) = \boxed{.1587}$

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

zoeprecalc

5.0

Solution

1

b. $z = \dfrac{295-298}{(3/\sqrt{6})} = -2.45$

$P(Z < -2.45) = \boxed{.0071}$

0.0071

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

LittleTurtle

5.0

Solution

Let X denote the ACT score of a randomly selected test taker.

$$P(X>23)=P\left(z>\frac{23-21.1}{5.1}\right)=P(z>0.37)=0.3557$$

See explanation for result.

There is 1 solution for this exercise.

Please see your textbook for the exercise prompt.

LittleTurtle

5.0

Solution

For a sample of size 50, the sampling distribution is Normal with mean $\mu_{\bar{x}} = 21.1$ and standard deviation $\sigma_{\bar{x}} = \frac{5.1}{\sqrt{50}} = 0.7212$. (10% condition OK since there are more than 500 ACT test takers).

$P(\bar{x} > 23) = P\left(z > \frac{23-21.1}{0.7212}\right) = P(z > 2.63) = 0.0043.$

See explanation for result.

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

LittleTurtle

?

Solution

No. The histogram of the sample values will look like the population distribution, whatever it might happen to be. The central limit theorem says that the histogram of the distribution of *sample means* (from many large samples) will look more and more Normal.

See explanation for result.

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

LittleTurtle

?

Solution

When the sample size is small, the sampling distribution is still skewed ot the right, but less so than the population. As the sample size n gets larger, the sampling distribution of the sample mean will more closely follow a Normal distribution,.

See explanation for result.

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

LittleTurtle

?

Solution

Since the distribution of the play times of the population of songs is heavily skewed to the right, a sample size of 10 will not be enough for the Normal approximation to be appropriate.

See explanation for result.

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

LittleTurtle

1.0

Solution

With a
sample size of 36, we now have enough observations in our sample for the Central Limit Theorem to apply. $P(\bar{x} > 240) = P\left(z > \frac{240-225}{60/\sqrt{36}}\right) = P(z > 1.5) = 0.0668.$

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 $\bar{x}$ is the mean number of strikes per square kilometer, then $\mu_{\bar{x}} = 6$ strikes/km^2 and

$$\sigma_{\bar{x}} = \frac{2.4}{\sqrt{10}} = 0.7589 \text{ strikes/km}^2.$$

See explanation for result.

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

LittleTurtle

5.0

Solution

We cannot calculate the probability, because we do not know the shape of the distribution of the number of lightning strikes. If we were told that the population is Normal, then we would be able to compute the probability.

See explanation for result.

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

LittleTurtle

5.0

Solution

With a sample size of 50, the Central Limit
Theorem assures us that the Normal approximation is valid for the sampling distribution of $\overline{x}$.

$$P(\overline{x} < 5) = P\left(z < \frac{5-6}{2.4/\sqrt{50}}\right) = P(z < -2.95) = 0.0016.$$

See explanation for result.

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

LittleTurtle

?

Solution

This probability cannot be calculated, because we do not know the shape of the distribution of the weights.

See explanation for result.

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

LittleTurtle

?

Solution

If W is total weight and $\bar{x} = W/30$, the central limit theorem says that $\bar{x}$ is approximately Normal with mean 190 lb and standard deviation $\sigma_{\bar{x}} = \frac{35}{\sqrt{30}} = 6.3901$ lb assuming the weights are independent. Thus, $P(W > 6000) = P(\bar{x} > 200) = P\left(z > \frac{200-190}{6.3901}\right) = P(z > 1.56) = 0.0594$. There is about a 6% chance that the total weight exceeds the limit of 6000 lb.

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. A count only takes on whole-number values, so it cannot be normally distributed.

See explanation for result.

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

LittleTurtle

?

Solution

The approximate distribution of $\bar{x}$ is Normal with mean $\mu_{\bar{x}} = 1.5$ people and standard deviation $\sigma_{\bar{x}} = \frac{0.75}{\sqrt{700}} = 0.0283$. Thus,

$$P(X > 1075) = P\left(\bar{x} > \frac{1075}{700}\right) = P(\bar{x} > 1.5357) = P\left(z > \frac{1.5357 - 1.5}{0.0283}\right) = P(z > 1.26)$$

$$= 0.1038.$$

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: What is the probability that the average loss will be no greater than \$275? *Plan*: The sampling distribution of the sample mean loss $\bar{x}$ has mean $\mu_{\bar{x}} = \mu_X = \$250$ and standard deviation $\sigma_{\bar{x}} = \frac{300}{\sqrt{10,000}} = \$3$. (10% condition is met assuming at least 100,000 policies). Since the sample size is so large (10,000>30) we can safely use the Normal distribution as an approximation for the sampling distribution of $\bar{x}$. *Do*: $P(\bar{x} > 275) = P\left(z > \frac{275-250}{3}\right) = P(z > 8.33) \approx 0$. *Conclude*: It is very, very unlikely that the company would have an average loss of more than \$275.

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: What is the probability that the mean number of flaws per square yard of carpet is more than 2? *Plan*: The sampling distribution of the sample mean number of flaws per square yard has mean $\mu_{\bar{x}} = 1.6$ and standard deviation $\sigma_{\bar{x}} = \frac{1.2}{\sqrt{200}} = 0.085$. (10% condition OK since there are more than 2000 square yards of material). Since the sample size is so large (200 > 30) we can safely use the Normal distribution as an approximation for the sampling distribution of $\bar{x}$. *Do*:

$P(\bar{x} > 2) = P\left(z > \frac{2-1.6}{0.085}\right) = P(z > 4.71) \approx 0$. *Conclude*: There is virtually no chance that the average number of flaws per yard in the sample will be found to be greater than 2.

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

Answer: a

See explanation for result.

0
Comments

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

LittleTurtle

5.0

Solution

1

Answer: c

See explanation for result.

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

LittleTurtle

3.2

Solution

Answer: b

See explanation for result.

1 Comment

Cynthia He 1 yr
Can you explain how you got b?

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

Answer: d

See explanation for result.

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

LittleTurtle
4.0

Solution

The unemployment rates for each level of education are:

$$P(\text{unemployed}|\text{didn't finish HS}) = \frac{(12,470-11,408)}{12,470} = \frac{1062}{12,470} = 0.0852$$

$$P(\text{unemployed}|\text{HS but no college}) = \frac{1977}{37,834} = 0.0523$$

$$P(\text{unemployed}|\text{less than bachelor's degree}) = \frac{1462}{34,439} = 0.0425$$

$$P(\text{unemployed}|\text{college graduate}) = \frac{1097}{40,390} = 0.0272$$

The unemployment rate decreases with additional education

See explanation for result.

0
Comments

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

LittleTurtle

?

Solution

$$P(\text{in labor force}) = \frac{12,470 + 37,834 + 34,439 + 40,390}{27,669 + 59,860 + 47,556 + 51,582} = \frac{125,133}{186,667} = 0.6704$$

See explanation for result.

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

LittleTurtle

?

Solution

$$P(\text{in labor force} \mid \text{college graduate}) = \frac{40,390}{51,582} = 0.7830$$

See explanation for result.

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

LittleTurtle

?

Solution

The events "in the labor force" and "college graduate" are not independent, since the probability of being in the labor force (0.6704) does not equal the probability of being in the labor force given that the person is a college graduate (0.7830).

See explanation for result.

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

LittleTurtle

?

Solution

The population is the set of all eggs shipped on the day in question. The sample consists of the 200 eggs examined. The parameter is the proportion $p = 0.001$ of eggs shipped that day that had salmonella.

The statistic is the sample proportion $\hat{p} = \frac{9}{200} = 0.045$ of eggs in the sample that had salmonella.

See explanation for result.

0
Comments

Have a comment? Type it here ...

Submit

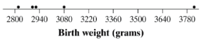
There is 1 solution for this exercise.
Please see your textbook for the exercise prompt.

LittleTurtle

?

Solution

Answers will vary. An example dotplot is given.



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 dotplot does not show the range of every possible sample of size 5 from the population. Instead it shows the ranges from 500 SRSs from the population. This is a very small subset of the values that make up the sampling 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

The sample range is not an unbiased estimator of the population range. If it were unbiased, then the sampling distribution would have 3417 (the actual range) as its mean. But, according to the graph, none of the 500 observations were greater than 3000 (and certainly none were greater than 3417). The mean in the graph is closer to 1200 which means that the sample range underestimates the value of the population range.

See explanation for result.

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

LittleTurtle

?

Solution

1

If we want to reduce the variability of the sampling distribution of the sample range, we should take larger samples.

See explanation for result.

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

LittleTurtle

5.0

Solution

The mean is $\mu_{\hat{p}} = p = 0.15$.

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 mean is $\mu_{\hat{p}} = p = 0.15$. (b) Since the population (all adults) is considerably larger than 10 times the sample size ($n = 1540$), the standard deviation is $\sigma_{\hat{p}} = \sqrt{\frac{0.15(0.85)}{1540}} = 0.0091$.

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
$np = 1540(0.15) = 231$ and $n(1-p) = 1540(0.85) = 1309$ are both at least 10, the sampling distribution is approximately Normal.

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

$$P(0.13 \le \hat{p} \le 0.17) =$$

$$P\left(\frac{0.13-0.15}{0.0091} \le z \le \frac{0.17-0.15}{0.0091}\right) = P(-2.20 \le z \le 2.20) = 0.9722$$

See explanation for result.

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

LittleTurtle

5.0

Solution

We are looking for the probability that, in random sample of 100 travelers, 20 or fewer get a red light. This is equivalent to finding $P(\hat{p} \le 0.20)$. First we need the sampling distribution of $\hat{p}$. The mean is $\mu_{\hat{p}} = p = 0.3$. Since the population (all travelers passing through Guadalajara, Mexico) is considerably larger than 10 times the sample size ($n = 100$), the standard deviation is $\sigma_{\hat{p}} = \sqrt{\frac{0.3(0.7)}{100}} = 0.0458$. Since $np = 100(0.3) = 30$ and $n(1-p) = 100(0.7) = 70$ are both at least 10, the sampling distribution is approximately Normal. This means that the probability can be computed as $P(\hat{p} \le 0.20) = P\left(z \le \frac{0.20 - 0.30}{0.0458}\right) = P(z \le -2.18) = 0.0146$.

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

1

The claim is unlikely to be true. There is only a 1.5% chance that we would find a sample with as few red lights as we saw in our sample if their claim was true.

See explanation for result.

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

LittleTurtle

5.0

Solution

Let X denote the WAIS score for a randomly selected individual.

$$P(X \geq 105) = P\left(z \geq \frac{105-100}{15}\right) = P(z \geq 0.33) = 0.3707.$$

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 $\mu_{\bar{x}} = 100$ and the standard deviation is $\sigma_{\bar{x}} = \frac{15}{\sqrt{60}} = 1.9365$.

See explanation for result.

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

LittleTurtle

?

Solution

$$P(\bar{x} \geq 105) = P\left(z \geq \frac{105-100}{1.9365}\right) = P(z \geq 2.582) = 0.0049$$

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

1

The
answer to (a) could be quite different. The answer to (b) would be the same because the mean and standard deviation do not depend on the shape of the population. Because of the large sample size, the answer we gave for (c) would still be fairly reliable because of the central limit theorem.

See explanation for result.

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

LittleTurtle

5.0

Solution

The mean is $\mu_{\bar{x}} = 0.5$ and the standard deviation is $\sigma_{\bar{x}} = \dfrac{0.7}{\sqrt{50}} = 0.0990$

See explanation for result.

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

LittleTurtle

5.0

Solution

Because we have a
large sample size (larger than 30), the Central Limit Theorem applies and

$$P(\bar{x} \geq 0.6) = P\left(z \geq \frac{0.6 - 0.5}{0.0990}\right) = P(z \geq 1.01) = 0.1562.$$

See explanation for result.

There is 1 solution for this exercise.

Please see your textbook for the exercise prompt.

LittleTurtle

3.0

Solution

The central limit theorem is not needed when the original distribution is Normal; the distribution of the sample mean is always Normal in that case.

See explanation for result.

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

LittleTurtle

5.0

Solution

b. Since a sample of 3% of the undergraduates from Ohio State University consists of approximately 1200 students whereas a sample of 3% of the undergraduates from Johns Hopkins consists of just 60 students, the estimate from Ohio State University will have less sampling variability.

See explanation for result.

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

Solution

b. The variation in the sample mean is related to the square root of the sample size, so if you double the sample size, the variation is reduced by the square root of 2.

See explanation for result.

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

LittleTurtle

5.0

Solution

b. The sampling distribution would be only approximately Normal with mean equal to the population proportion (0.55 in this case) and standard deviation equal to $\sqrt{\frac{(0.55)(0.45)}{250}} = 0.03$.

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

e. The sampling distribution has information about how the sample mean varies from sample to sample, not what any sample itself looks like.

See explanation for result.

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

LittleTurtle

?

Solution

1

e. We do not have a sample size large enough to use the central limit theorem and we do not know that the distribution of fill amounts is Normally distributed.

See explanation for result.

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

LittleTurtle

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Solution

e. The distribution of the average amount of pay will not be Normal because there are only three possible outcomes, $\bar{x}$ = 40, 60, or 80.

See explanation for result.

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

LittleTurtle

5.0

Solution

Sample statistic A provides the best estimate of the parameter. Both statistics A and B appear unbiased, while statistic C appears to be biased (low). In addition, statistic A has lower variability than statistic B. In this situation, we want low bias and low variability, so statistic A is the best choice.

See explanation for result. ...

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

LittleTurtle

5.0

Solution

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We cannot calculate this probability because we do not know the shape of the distribution of the amount that individual households pay for internet service. For instance, we know that "many households pay about $10" but we don't know what percent of households are in this category.

See explanation for result.

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

LittleTurtle

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Solution

The
mean of the sampling distribution of the sample mean is the same as the mean of the original distribution.
Therefore $\mu_{\bar{x}} = \mu_x = \$28$. Also we know that $\sigma_{\bar{x}} = \frac{10}{\sqrt{500}} = 0.4472$ because there are at least 10(500) = 5000 households with internet access.

See explanation for result.

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Comments

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There is 1 solution for this exercise.
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Solution

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Since the sample size is large (much more than 30), the central limit theorem tells us that the sampling distribution of the sample mean is approximately Normal.

See explanation for result.

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Comments

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

LittleTurtle

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Solution

$P(\bar{x} > 29) = P\left(z > \dfrac{29-28}{0.4472}\right) = P(z > 2.24) = 0.0125$. There is about a 1.25% chance of getting a sample of 500 in which the average amount paid for the Internet is more than \$29.

See explanation for result.

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Comments

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There is 1 solution for this exercise.
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LittleTurtle

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Solution

We know that $\mu_{\hat{p}} = p = 0.22$. Since the population size (all children under 6 years old) is much more than 10 times the sample size (300), we know that $\sigma_{\hat{p}} = \sqrt{\frac{0.22(0.78)}{300}} = 0.0239$.

$\sigma_{\hat{p}} = \sqrt{\frac{0.22(0.78)}{300}} = 0.0239$. Finally, since $np = 300(0.22) = 66$ and $n(1-p) = 300(0.78) = 234$ are both at least 10, the sampling distribution of the sample proportion is approximately Normal. This leads to the following probability calculation: $P(\hat{p} > 0.2) = P\left(z > \frac{0.2 - 0.22}{0.0239}\right) = P(z > -0.84) = 0.7995$. There is about an 80% chance that a sample of 300 children will yield more than 20% who live in households with incomes less than the official poverty level.

See explanation for result.

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