Questions on lesson 2.3?

We will be having our concept mastery quiz shortly.

**Quiz questions online to correct mistakes for retaking quizzes.

Feb 27-8:47 AM

NO QUIZ TODAY!!

Sep 18-8:52 AM

FROM LESSON 2.3 - PG.80 IN YOUR BOOK

PROBLEM **2**   **Sweet Dreams: Exploring Continuous Data**

Just like with the categorical data, a more practical method for estimating the population mean amount of sleep for High Marks High School students is to use the sample mean to calculate an estimate for the standard deviation of the sampling distribution. The formula for the standard deviation of a sampling distribution for continuous data is $\frac{s}{\sqrt{n}}$ where s is the standard deviation of the original sample and n is the sample size.

NOT IN YOUR BOOK

2. Two hundred teenage boys were surveyed about the number of hours they spend each week playing video games. The sample mean was 11.7 hours and the standard deviation was 3.4 hours.

   a. Determine the standard deviation for the population mean.

   $$\frac{s}{\sqrt{n}} \rightarrow \frac{34}{\sqrt{200}} \approx 0.24$$

   b. Determine a 95% confidence interval for the population mean.

   $$11.7 \pm 2(0.24) \rightarrow 11.22 \text{ to } 12.18$$
   is the 95% C.I.

3. Five hundred teenage girls were surveyed about the number of hours they spend each week listening to music. The sample mean was 9.2 hours and the standard deviation was 2.7 hours.

   a. Determine the standard deviation for the population mean.

   $$\frac{2.7}{\sqrt{500}} \approx 0.12$$

   b. Determine a 95% confidence interval for the population mean.

   8.96 to 9.44 is the 95% C.I.

   $$9.2 \pm 2(0.12)$$

SM3H Ch 2 - Student Text.pdf - Adobe Reader

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2. Use the standard deviation from the original sample to determine the standard deviation for the sampling distribution. Explain your work.

$$\frac{s}{\sqrt{n}} = \frac{0.8}{\sqrt{50}} \approx 0.11 \text{ hour}$$

Recall that the formula for the standard deviation of a sampling distribution of categorical data is

$$\sqrt{\frac{\hat{p}(1 - \hat{p})}{n}}.$$

③ $\bar{x} = 7.7$ hrs.

95% C.I. → 7.48 to 7.92 hrs.

$7.7 \pm 2(0.11)$

Making Inferences and Justifying Conclusions

Sep 18-1:41 PM

How Much Different?
Using Statistical Significance to Make Inferences About Populations

2.4

pg. 87 in your book

The term **statistically significant** is used to indicate that a result is very unlikely to have occurred by chance. Typically, a result that is more than 2 standard deviations from the mean, or outside a 95% confidence interval, is considered statistically significant.

NOT IN YOUR BOOK

1. Legislators have been trying to increase public support for the construction of a new bridge in their state's largest city through a broad advertising campaign. Prior to the advertising campaign, 539 out of 1400 people that were polled said they supported the bridge project. Following the advertising campaign, 561 out of 1100 people that were polled said they supported the project.

   a. Determine the sample proportion of people who support the new bridge for each poll.

   b. Determine whether the results of the 2 polls are statistically significant. Use a 95% confidence interval when making your calculations.

   c. Based on your findings in part (b), what can you conclude about the impact of the ad campaign?

Sep 18-8:53 AM

Take 10 minutes to work on Problem 1 with your groups
on pgs.86-89

PROBLEM 1   Whatta Water: Exploring Categorical Data

Commercials on a local TV station claim that Whatta Water tastes better than tap water, but a local news anchor does not believe the claim. She sets up an experiment at a local grocery store to test the claim. A representative, unbiased sample of 120 shoppers participate in the tasting survey using unmarked cups. Out of the 120 people, 64 said Whatta Water tastes better than tap water.

1. If shoppers had to choose one or the other and there was no difference in the tastes of the two waters, what proportion of shoppers would you expect to say that Whatta Water tastes better? Explain your reasoning.

$$50\% \ldots$$

2. What is the sample proportion of shoppers who stated that Whatta Water tastes better?

$$\frac{64}{120} = 0.53 \approx 0.53$$

3. Based on your answers to Questions 1 and 2, what reason(s) can you give to doubt Whatta Water's claim? Explain your reasoning.

4. Use a 95% confidence interval to determine a range of values for the population proportion of people who prefer the taste of Whatta Water. Explain your work.

margin of error:
$$2(0.046) = 0.092$$

$$\sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \rightarrow \sqrt{\frac{0.53(1-0.53)}{120}} \approx 0.046$$

$$\rightarrow 0.53 \pm 2(0.046) =$$

5. Use the sample proportion and standard deviation of the sampling distribution to label the horizontal axis of the normal curve.

50%

39.2 43.8 48.4 53 57.6 62.2 66.8

Percent Who Prefer Whatta Water to Tap Water
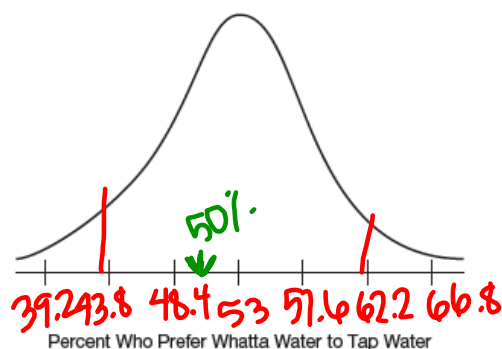
6. Based on the range of values of the 95% confidence interval, what conclusion can you make about Whatta Water's claim that their water tastes better than tap water?

Whatta Water's claim is probably not true, because 50% is in the 95% C.I. The sample proportion of 53% is not statistically significant.

Sep 18-8:59 AM

<p style="text-align: center; color: blue;">NOT IN YOUR BOOK</p>

2. A random sample of 150 qualifying speeds was collected from data on stock car races. The mean qualifying speed was 191.8 miles per hour with a standard deviation of 2.1 miles per hour.

   a. Determine a range of values for the population mean using a 95% confidence interval.

   b. Burn Rubber Tires introduces a new tire they claim is revolutionary. They guarantee these tires will increase the speeds of stock cars. A random sample of 150 qualifying speeds of cars using these new tires is collected. The average qualifying speed of cars with these tires is 192.08 miles per hour. Are the results of the sample using the new tires statistically significant? What can you conclude about the effectiveness of the new tires? Explain your reasoning.

3. On average, 48% of all babies born in the United States are girls. In the past year, 473 of the 860 babies born in one particular county were girls. Determine whether the birth rate for girls in this county is statistically significant. Use a 95% confidence interval when making your calculations.

Homework

Finish lesson 2.4 through pg. 99

Aug 24-2:00 PM