Long Question 3 - Scrabble Pizza Party

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You and your friend decide throw a scrabble pizza party. You don't know how many pizzas to order, so you want to obtain an estimate of slices each person would eat. You perform a poll of ten randomly selected patrons to see how many slices they each ate. Their responses are denoted X_i, $i = 1, \ldots, 10$, and

$$\bar{X} = \frac{1}{10} \sum_{i=1}^{10} X_i = 4.3$$

$$s^2 = \frac{1}{9} \sum_{i=1}^{10} (X_i - \bar{X})^2 = 2.7$$

Question 11

0.0/1.0 point (graded)

Assuming that the X_is are *i.i.d.* normal, construct a 95 confidence interval for the mean of the X_is. Enter the lower and upper bounds on the interval $[a, b]$.

Please round your answer to 2 decimal points

Lower bound **a**:

3.28

✖ **Answer:** 3.12

3.28

Upper bound **b**:

5.32

✖ **Answer:** 5.48

5.32

Explanation

$$\bar{X} \pm t_{0.025,n-1} \frac{s}{\sqrt{n}}$$

Plugging in the relevant numbers from the table:

$$4.3 \pm 2.26 \frac{\sqrt{2.7}}{\sqrt{10}}$$

$$[3.12, 5.48]$$

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Question 12

0.0/1.0 point (graded)

How many patrons would you have had to poll to limit the width of the confidence interval to one slice?

Please round your answer to the nearest whole number.

42 ✖ **Answer:** 692

42

Explanation

$$2\frac{2\sqrt{2.7}}{\sqrt{n}} < 0.25 \implies n > (\frac{4\sqrt{2.7}}{0.25})^2 \implies n > 692$$

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Question 13

1.0/1.0 point (graded)

True or False? Suppose your friend gives you the additional information that the X_is have a uniform distribution on $[0, \theta]$ instead. Unfortunately, he has already thrown away the original data and kept the sample mean and the sample variance he computed. You can still construct a 95% confidence interval for the mean of the X_is.

- (•) True ✔
- ( ) False

Explanation

You can still construct a 95% confidence interval for the mean of the X_i, you can just use $2\bar{X}$ as an estimate for θ.

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