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5. Confidence Intervals Concept  
> Checks Continued

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## 5. Confidence Intervals Concept Checks Continued

### Confidence Interval Concepts Review and Some Philosophical Remarks

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So I give you a confidence interval

### Exercises

**d)** If  $[0.34, 0.57]$  is a 95% confidence interval for an unknown proportion  $p$ , then the probability that  $p$  is in this interval is

1. 0.025
2. 0.05
3. 0.95
4. None of the above

**e)** If  $[0.34, 0.57]$  is a 95% confidence interval for an unknown proportion  $p$ , is it also a 98% confidence interval?

1. Yes
2. No

**f)** If  $[0.34, 0.57]$  is a 95% confidence interval for an unknown proportion  $p$ , is it also a 90% confidence interval?

1. Yes
2. No

at 95% for an unknown proportion piece, so 0.34, 0.37.

What is the probability that  $p$  is in this interval?

Who says it's 2.5%?

Probably led by  $q$  alpha over 2, right?

Who says that it's 5%?

Very good.

Who says that it's 95%?



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## More explanation and Some Philosophical Remarks

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So the answer here is none of the above.

Is anybody completely confused?

Yes.

Very good.

So the probability that p--  
anybody is confused by this?

OK.

This is fine.

This is a probability about some random  
variable  $R_n$ .



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## Confidence Interval Concept Check 5

2/2 points (graded)

Based on some data gathered by your company, you produce a (realization of a) confidence interval  $[0.34, 0.57]$  that has (asymptotic) level 95%. Upon presenting your data and confidence interval to your employers, they ask you two questions:

Can the interval  $[0.34, 0.57]$  also be used as a (realization of a) confidence interval of (asymptotic) level 98 % ?

☐ Yes☒ No

Can the interval  $[0.34, 0.57]$  also be used as a (realization of a) confidence interval of (asymptotic) level 90 % ?

☒ Yes☐ No**Solution:**

A confidence interval  $\mathcal{I}$  at level 95% for the parameter  $p$  satisfies

$$\mathbf{P}[\mathcal{I} \ni p] \geq 0.95 \geq 0.90.$$

By definition,  $\mathcal{I}$  is also a confidence interval of (asymptotic) level 90%.

However, a confidence interval at level 95% may be too small to also be a confidence interval at level 98%. Hence, the first statement is not true in general: the answer to the first question is "No."

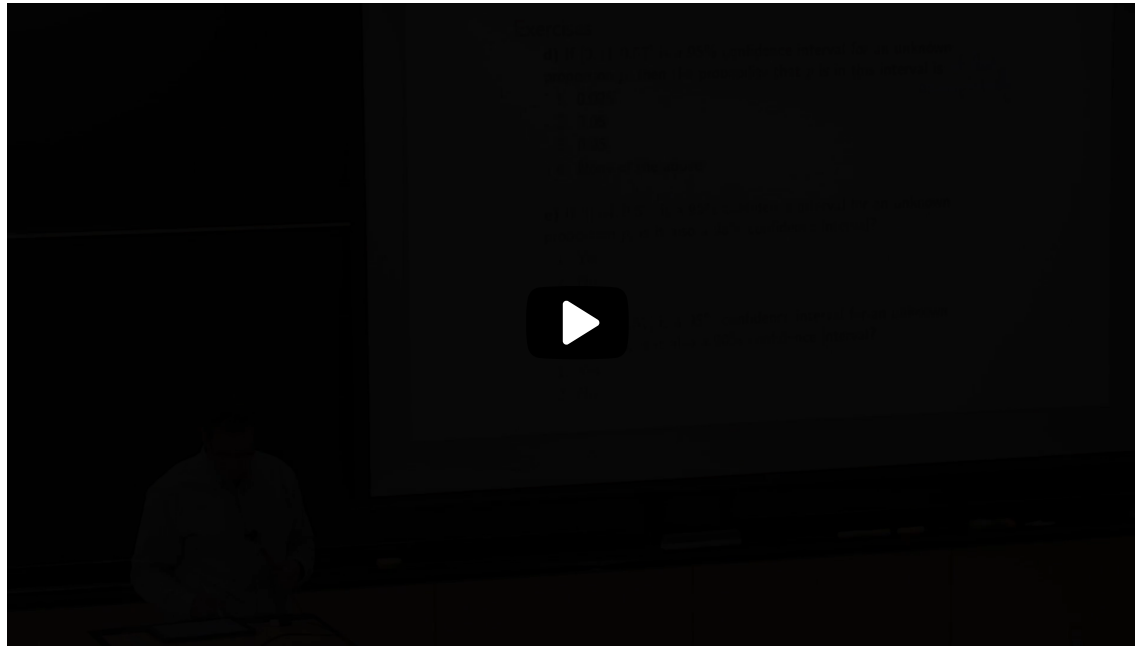
You have used 1 of 1 attempt

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**i** Answers are displayed within the problem

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## Confidence Interval Concepts Review (Continued)



No, right because the other way around definitely

works, but this way just does not.

So that's probably the next question.

So if now if I have a 95% confidence interval, is it also a confidence interval at a lower confidence level?

Yes.

I'm just surrendering width, right.

I'm surrendering accuracy by using a 95% confidence

**interval to make a 90% confidence statement.**

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