Guided Thought Questions

MATH 322: Mathematical Statistics II
Learning Module 2: Intervals

All textbooks are written at two cognitive levels. The surface level is the literal information provided in the book. The deeper level is the connections between the topics. Textbooks are excellent at the surface level, rarely good at the deeper level. To help with the deeper levels, I am providing several questions for each section of the textbook.

　　You should take time to answer these questions after reading the section. Answer them in your notes. Make sure that you are able to confidently answer them. In fact, you should feel pressure to ask these questions in class if you cannot answer them.

Readings: Sections 5.4 to 5.7

§4: The Pivotal Method

1. What are the requirements for something to be a pivotal quantity?
2. Why are those the requirements?
3. How are confidence intervals related to probabilities?

§5: One-Sample Confidence Intervals

1. Why is n = 30 "large enough"?
2. What is the pivotal quantity for the population mean if the population variance is known?
3. What is the pivotal quantity for the population mean if the population variance is *not* known?
4. Why does the sample size affect the margin of error?

§6: A Confidence Interval for the Population Variance

1. Compare and contrast the Chi-square and Normal distributions.
2. What is the pivotal quantity for the population variance?
3. Why is χ^2_U associated with the lower bound and not χ^2_L?

§7: Confidence Interval Concerning Two Population Parameters

1. Explain the parts of the pooled variance formula.
2. Why is it that when the population variances are the same, we do not have to approximate the number of degrees of freedom?