

Ch 18 Confidence Intervals Practice #1

Directions: Read each question carefully. Be sure to use proper notation, write your answer as indicated, and show work as needed to indicate your understanding of the concepts.

1) Pew Research reports that 63% of the U.S. adult cell phone owners use their phone to go online. A company wants to target 16- to 24-year olds for advertising and they wonder if that age group has a similar pattern of phone use.

<p>a) The company wants to estimate the true percentage of 16- to 24-year old cell phone owners who use their phone to go online to within $\pm 7.5\%$, with 95% confidence. How many cell phone owners in this age group should they sample?</p>	
<p>b) They ignore your advice in Question 1 and just select a random sample of 300 cell phone users aged 16 to 24, and find that 206 of those surveyed use their phone to go online. Create the confidence interval.</p>	<p><u>Check Conditions:</u></p> <p><u>Confidence Interval:</u></p> <p><u>Conclusion in Context (formal sentence):</u></p>
<p>c) Interpret the confidence interval in this context.</p>	
<p>d) Explain what 95% confidence means in this context.</p>	
<p>e) Should the company conclude that the percentage of cell phone owners in this age group who use their phone to go online is different from 63%? Explain.</p>	

2) A state's Department of Education reports that 12% of the high school students in that state attend private high schools. The State University wonders if the percentage is the same in their applicant pool. Admissions officers plan to check a random sample of the over 10,000 applications on file to estimate the percentage of students applying for admission who attend private schools.

<p>a) The admissions officers want to estimate the true percentage of private school applicants to within $\pm 4\%$, with 90% confidence. How many applications should they sample? <i>Round to the nearest whole number.</i></p>	
<p>b) They actually select a random sample of 450 applications, and find that 46 of those students attend private schools. Create the confidence interval. <i>Round decimal to nearest thousandth (3 places), and round the nearest tenth of a percent.</i></p>	
<p>c) Interpret the confidence interval in this context.</p>	
<p>d) Explain what 90% confidence means in this context.</p>	
<p>e) Should the admissions officers conclude that the percentage of private school students in their applicant pool is lower than the statewide enrollment rate of 12%? Explain.</p>	

3) What does the Central Limit Theorem (CLT) tell us about sampling distribution? (Ch 17)

4) Why are confidence intervals relevant for analyzing data and drawing conclusions? Explain.

5) What is a confidence interval and how does it connect to the CLT?
