Group Members: _____

Introduction to Confidence Intervals. Social networking sites have become fixtures in the social lives of many people around the world. A Pew Research poll surveyed U.S. residents to ask about their use of social media and study trends in usage. Of the 156 respondents aged 18 to 22 who use Facebook, 30.77% stated that they updated their Facebook status at least once per day.

1. Is 0.3077 a parameter or a statistic? Explain.

2. Does this finding necessarily **prove** that 30.77% of all U.S. residents aged 18–22 years old update their Facebook status at least once per day? Explain why or why not.

3. We call the sample proportion $\hat{p}$ a **point estimate** for the population proportion p. The <u>**estimated standard error**</u> of this sample statistic is defined as

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

   What is the difference between this estimate of standard error and the standard error $\sigma_{\hat{p}}$ we calculated in Chapter 8 for the sampling distribution of $\hat{p}$? (Hint: See page 124 of your Lecture Guide and compare.)

4. Compute the estimated standard error of our sample statistic, $\hat{p} = 0.3077$. Show your work and round to four decimal places.

5. Let's say we want to estimate **within two standard errors** of $\hat{p}$. We can do so by calculating $\hat{p} - 2(SE)$ and $\hat{p} + 2(SE)$. Find these values and write your result as an interval in the format (lower, upper). This is called an **interval estimate** of p.

6. Do you know for **certain** if p, the true proportion of **all** U.S. adults aged 18–22 who update their Facebook status at least one time per day, is contained in the interval? Why or why not?

   Congratulations! You just constructed a **confidence interval**!