Students Born in Virginia   **Math 121 - Workshop**

Last year, 29 out of the 47 students in my statistics class were born in Virginia.

1. What is the sample proportion $\hat{p}$ that were born in Virginia?

2. Hopefully my students are a reasonably representative sample of all students at Hampden-Sydney. Assuming this is the case, make a 95% confidence interval for the proportion of all Hampden-Sydney students that were born in Virginia.

3. What are we 95% sure is in this confidence interval?

4. In this situation, we had 29 students who were born in Virginia and 18 who were not. This sample size is big enough that we can probably trust our confidence interval, but a plus-4 method confidence interval would be more robust. To make a **plus-4 confidence interval**, add two fake "successes" and two fake "failures" to the data, and then recalculate the confidence including the fake data (so $\hat{p}$ will be change and n will increase by 4). Make the plus-4 confidence interval.

5. What is the margin of error of the plus-4 confidence interval?