Confidence Intervals take 2   Name:_____

You've just listened to Toby Keith's new song "Made in America" and think it is the most American song written in the last 50 years. You are curious how many other students at Iowa State also share this view.

1. How many students must you sample if you want to make a 95% confidence interval with a margin of error of at most 0.025? *hint: use $\hat{p} = 0.5$ to be conservative.*

$$n \geq \hat{p}(1 - \hat{p}) \left(\frac{z^*}{ME} \right)^2 =$$

2. Name the 3 conditions that must be satisfied for your confidence interval to be valid.

    (a)

    (b)

    (c)

Here we are interested in the proportion, p, of all students at Iowa State who think "Made in America" is the most American song written in the last 50 years. But we do not know the value of this proportion and consequently do not know the sampling distribution for $\hat{p}$.

3. Below are five 95% confidence interval generated from the unknown sampling distribution. Which of the following intervals contain the population proportion, p.

95% Confidence Interval	Does the interval contain p?		
(0.288, 0.334)	☐ Yes	☐ No	☐ Don't Know
(0.260, 0.305)	☐ Yes	☐ No	☐ Don't Know
(0.310, 0.357)	☐ Yes	☐ No	☐ Don't Know
(0.287, 0.334)	☐ Yes	☐ No	☐ Don't Know
(0.295, 0.341)	☐ Yes	☐ No	☐ Don't Know

4. Calculate the Margin of Error of the first interval (0.288, 0.334).

5. Confidence refers to the "capture rate" of the intervals. While we can never know if any one particular interval contains the population proportion, in the long run (sampling many many times), what percentage of these 95% confidence intervals will contain the population proportion?