MAT 135, Discussion Questions 4.08

1. In July, PPP polled 1072 Michigan residents about the support for LGBT employment rights: 68% support a law making it illegal to fire or deny housing in Michigan because someone is gay, lesbian, or transgender. What is the standard deviation of this sampling distribution?

$$\sqrt{\frac{p(1-p)}{n}} = \sqrt{\frac{.68(.32)}{1072}} = .0142$$

2. In March, PPP polled 691 Americans and asked them which was the better book: *To Kill a Mockingbird* or *Fifty Shades of Gray*. 63% said *To Kill a Mockingbird* was better. What is the standard deviation for this sampling distribution?

$$\sqrt{\frac{.63(.37)}{691}} = .01837$$

3. Gallup surveyed 3499 people in August to determine if there was public support for standardized tests in school. They found that 78% reported "No". What is the probability that a majority of Americans actually support standardized tests? (i.e. what is the probability that this value was obtained from a distribution with a mean of 50% or lower.)

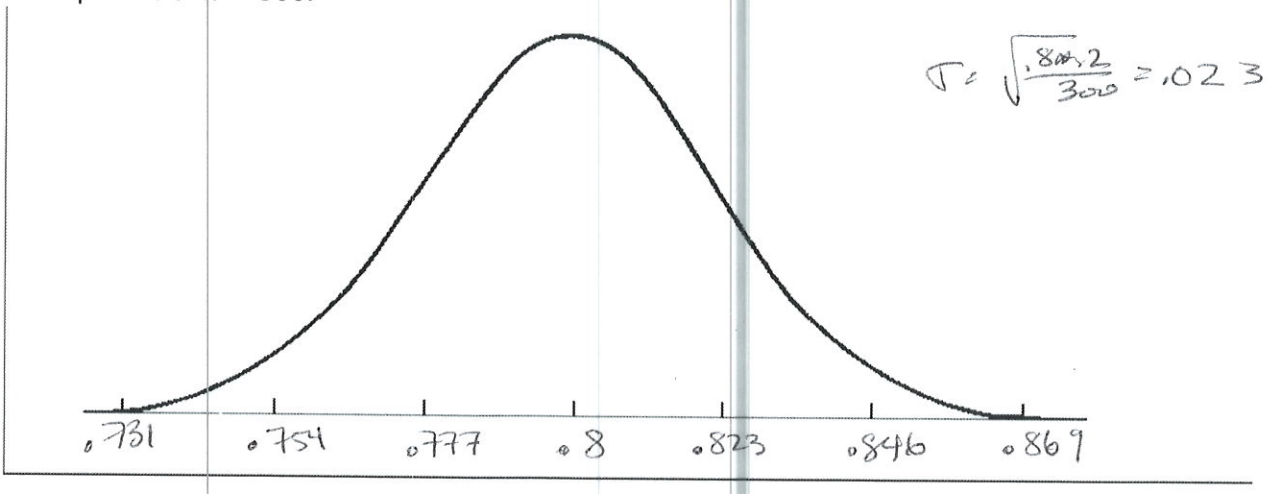
$$\text{normalcdf}\left(.78, E99, .5, \sqrt{\frac{.5(.5)}{3499}}\right) = 0$$

4. When working with proportions, how does the Central Limit Theorem relate to the Law of Large Numbers?

the law of large #'s is a general statement of qualities but the CLT is the same thing w/ specifics LLN also tends to be about proportions, while CLT applies to more statistics

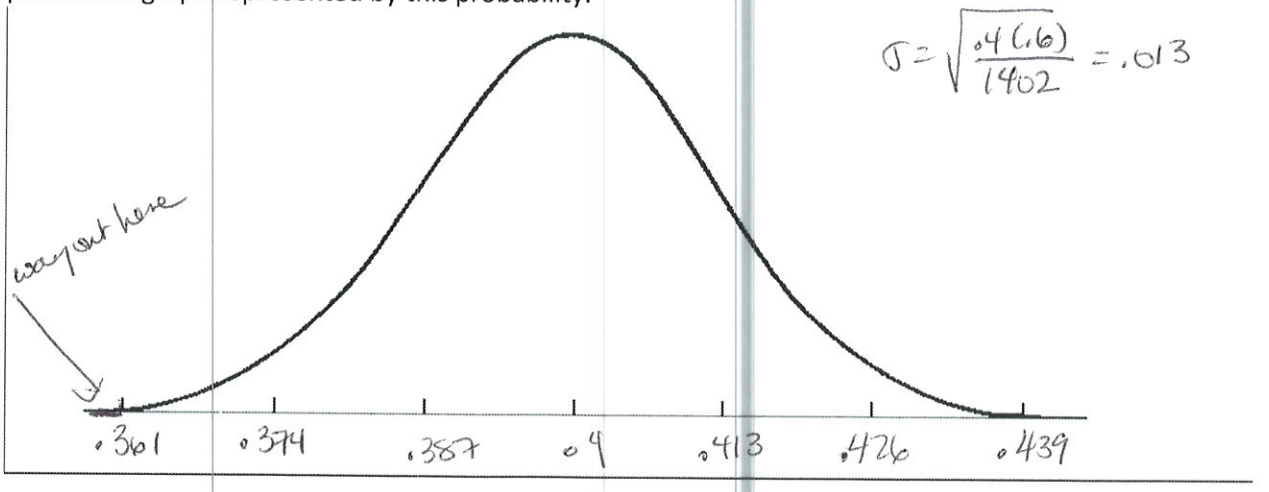
5. On the blank graph below, plot the sampling distribution of a proportion centered at $p = .80$ for a sample size of $n = 300$.

$\sigma = \sqrt{\frac{.8(.2)}{300}} = .023$



6. Graph the sampling distribution of the proportion centered at $p = 0.4$ with a sample size of $n = 1402$. Find the probability that the sample proportion will be less than $\hat{p} = 0.36$. Shade the part of the graph represented by this probability.

$\sigma = \sqrt{\frac{.4(.6)}{1402}} = .013$



shade part here

normalcdf(-E99, .36, .4, .013) = .0010458

0.1%