

MAT 223, Discussion Questions 11.06

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?

$$S_{\hat{p}} = \sqrt{\frac{.68(.32)}{1072}} = .01424$$

1.4%

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?

$$S_{\hat{p}} = \sqrt{\frac{.63(.37)}{691}} = .018366..$$

1.8%

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.)

$$\hat{p} = 22\% \quad (\text{get same answer using } 78\% \text{ of appropriate inequality})$$

$$S_{\hat{p}} = \sqrt{\frac{.5(.5)}{3499}} = .00845..$$

Normalcdf(-E99, .22, .5, .00845...) = 0  
 or Normalcdf(.78, E99, .5, .00845...)

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

When working with proportions, the central limit theorem explains the law of large numbers. as the sample size grows, the proportion of the samples gets closer to the mean (the classical value), and does so as  $1/\sqrt{n}$  as sample size increases.

5. Comment on the article at <http://www.niemanlab.org/2013/11/matt-waite-how-i-faced-my-fears-and-learned-to-be-good-at-math/>. Compare to this one: [http://www.huffingtonpost.com/apryl-delancey/girls-arent-good-at-math\\_b\\_8005068.html](http://www.huffingtonpost.com/apryl-delancey/girls-arent-good-at-math_b_8005068.html)