

MATH 156.3 — QUIZ IX

An article in the *Washington Post* claimed that 15% of high school students used cursive writing on the essay part of the SAT exam in 2005/6. Suppose you want to design a study to estimate the proportion of cursive writers for the following year. How many essays would you need to sample in order to estimate this proportion to within a margin of error of ± 0.01 with 99% confidence? (Use the 2005/6 sample proportion as a reasonable starting guess for how the next year's proportion will turn out.)

Remember:

$$\text{CI: } \hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = \hat{p} \pm \text{MoE}$$

$$\text{CLT: } \hat{p} \text{ is Normal } \left(\pi, \sqrt{\frac{\pi(1-\pi)}{n}} \right)$$

$$\begin{array}{l} \text{Conf. level:} \quad 80\% \quad 90\% \quad 95\% \quad 99\% \quad 99.9\% \\ \text{Crit. val. } z^*: \quad 1.282 \quad 1.645 \quad 1.960 \quad 2.576 \quad 3.291 \end{array}$$

$$\text{LSRL: } \hat{y} = a + bx; \quad b = r \frac{s_y}{s_x}, \quad a = \bar{y} - b\bar{x}$$