AMS 102: QUIZ 4

SOLUTIONS

In recent elections Henry Fielding received 60% of all votes, while his opponent Sam Richardson got only 40%. What is the probability that out of 24 randomly selected voters more than 70% voted for Mr. Fielding?

The true proportion of votes for Fielding is $p = 0.6$ *(that is, 60%). We are interested in the sample proportion* $\hat{p} = 0.7$ *(that is, 70%).*

The sample proportion is approximately normally distributed with a mean $p = 0.6$ *and standard deviation* $\sqrt{\frac{p(1-p)}{n}} = \sqrt{\frac{0.6 \cdot 0.4}{24}} = \sqrt{0.01} = 0.1.$

The $z - score$ *for* 0.7 *is* $\frac{0.7 - 0.6}{0.1} = \frac{0.1}{0.1} = 1.$

The probability $P(\hat{p} > 0.7)$ *equals* $P(z > 1) = 1 - P(z < 1) = 1 - 0.8413 = 0.1587.$