

Answer on Question #48383 – Math - Statistics and Probability

Find the minimum sample size you should use to assure that your estimate of P will be within the required margin of error around the population p. Margin of error: 0.02; confidence interval: 95%; from a prior study, P is estimated by the decimal equivalent of 57%

Solution

Confidence interval for population proportion is

Sample proportion \pm Margin of error.

Margin of error = z – score for 95% confidence \cdot Standard error of p.

$$0.02 = 1.96 \cdot \sqrt{\left(\frac{0.57 \cdot 0.43}{n}\right)},$$

where Standard error of p is $\sqrt{\frac{p(1-p)}{n}}$.

$$n = 0.57 \cdot 0.43 \cdot \left(\frac{1.96}{0.02}\right)^2 = 235.$$

Therefore the minimum sample size, that can be used, is $n = 235$.

Answer: 235.