Answer on Question #55872 – Math – Statistics and Probability

A market researcher for a provider of ipod accessories wants to know the proportion of customers who own cars to access the market for a new ipod car charger. A survey of 500 customers indicates that 76% own cars.

How large would the standard deviation have to be if he had surveyed only 125 customers assuming the proportion is about the same?

Solution

This is a binomial distribution with a sample proportion of $p = 0.76$ and the sample size of $n = 125$. Thus, the standard deviation of a sample proportion is

$$s = \sqrt{\frac{p(1-p)}{n}} = \sqrt{\frac{0.76(1-0.76)}{125}} = 0.038 \; or \; 3.8\%.$$

Answer: $\mathbf{0.038}$ $\boldsymbol{or}$ $\mathbf{3.8}\%$.