

Answer on Question #42116-Math-Statistics and Probability

A random sample of 30 companies dealing in network products was selected to determine the proportion of such companies that have implemented new software to improve productivity. It turned out that 8 had implemented such software. A) Find a 95% confidence interval on p , the true proportion of such companies that have implemented new software and B) how many companies would need to be sampled in order to have a 95% confident that the estimate of p is within 0.05 of the true value?

Solution

A) $n = 30, x = 8$, and $z_{0.025} = 1.96$. So, limits of confidence intervals are

$$\frac{4}{15} \pm (1.96) \sqrt{\frac{\frac{4}{15} \cdot \frac{11}{15}}{30}} = \frac{4}{15} \pm 0.158,$$

which yields $0.108 < p < 0.425$.

B)

$$n = \frac{(1.96)^2 \cdot \frac{4}{15} \cdot \frac{11}{15}}{0.05^2} = 301, \text{ when round up.}$$

Answer: A) $0.108 < p < 0.425$; B) 301.