Confidence Interval for P.

Pope High School Administrators are interested in the proportion of the student body ~~upperclassmen~~ are going to prom. In the past they expect 35% of the student body to attend prom. The administrators do a simple random sample of 137 students and find that 59 students are going to prom. Is there convincing evidence that there are more than 35% of Pope's student body going to prom? Use a 96% confidence interval.

$\hat{p} = \frac{59}{137} = .43$

LYA: SRS – stated in problem.

Ind: Safely Assume pop Pope > 1370

show $n\hat{p} \geq 10$ $(n\hat{q}) \geq 10$

$137(.43) = 58.91 > 10$ $137(.57) = 78.09$

$\hat{p} \pm z^* \left(\sqrt{\frac{\hat{p}\hat{q}}{n}}\right)$ magic bottom 1-prop z-interval

$.43 \pm 2.054 \left(\sqrt{\frac{.43(.57)}{137}}\right)$

$(.344, .518)$

With 96% confidence the prop of PHS students going to prom is btwn .344 to .518

Answer the Question

Since .35 is in the interval there is NOT convincing evidence that true proportion is not .35

We want 96% confidence but ME to be t .04 How big sample size?

$\hat{p} \pm z^* \left(\sqrt{\frac{\hat{p}\hat{q}}{n}}\right)$ → $z^* \sqrt{\frac{\hat{p}\hat{q}}{n}} = E$

$z^* \sqrt{\hat{p}\hat{q}} = \sqrt{n}\,(E)$

$n = \left[\frac{z^* \sqrt{(\hat{p}\hat{q})}}{E}\right]^2$

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$n = \left[\frac{2.054\sqrt{.43(.57)}}{.04}\right]^2$

$= 646.29 \rightarrow \boxed{647}$ people

if no idea what $\hat{p}$ is.

use $\hat{p} = .5$

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