

Homework Solutions

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Exercise 8

- (a) Check that $(40)(0.60) = 24 > 5$ and $(40)(.40) = 16 > 5$, so \hat{p} has a normal distribution. That means that we can use `normalcdf` to find the probability. The mean and standard deviation of \hat{p} are

$$\mu_{\hat{p}} = 0.60$$

and

$$\sigma_{\hat{p}} = \sqrt{\frac{(0.60)(0.40)}{40}} = 0.07746.$$

Then the probability that \hat{p} will be greater than 0.75 is

$$\text{normalcdf}(.75, \text{E99}, .60, .07746) = 0.0264.$$

- (b) Find the probability of fewer than 25%. If it is really small, then it would be quite unusual.

$$\text{normalcdf}(-\text{E99}, .25, .60, .07746) = 3.117 \times 10^{-6} = 0.000003117.$$

That's pretty unusual.