warm-up

An opinion poll asks, "Are you afraid to go outside at night within a mile of your home because of crime?" Suppose that the proportion of all adults who would say Yes to this question is p = 0.4.

Explain what the sampling distribution of the sampling proportions means.

graph of all possible samp. prop. ($\hat{p}$) of size n from this population.

What does the Central Limit Theorem say about the sampling distribution of the sample proportions from SRSs of size 30 from this population? (Hint: check the conditions, describe the shape, center, and spread, and draw a sketch - pg. 265)

p = .4
n = 30

The CLT says the samp. dist. of $\hat{p}$ will be:

- approx normal if n is large → $30(.40) \geq 10$, $12 \geq 10$ ✓; $30(1-.4) \geq 10$, $18 \geq 10$ ✓
- mean of $\hat{p}$ = $\mu_{\hat{p}}$ = .4
- st. dev. of $\hat{p}$ = $\sigma_{\hat{p}} = \sqrt{\frac{.4(1-.4)}{30}} = .089$

Based on this information, what values of $\hat{p}$ would be surprising?

$.4 \pm 2(.089)$

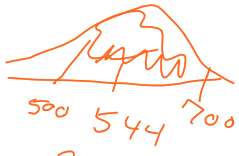
(.222, .578)

above .578
below .222

GRE scores range from 200 - 900

normal w/ a mean of 544
and st. dev. of 103.

- what prop. score between 500 and 700?



$z = \frac{500 - 544}{103} = -.43$ $P(z < -.43) = .3336$

$z = \frac{700 - 544}{103} = 1.51$ $P(z < 1.51) = .9345$

$.9345 - .3336 = .6009$

- what score would a student need to be in top 10%.

invnorm(.9) = 1.28 = z

$z = 1.28 = \frac{x - 544}{103}$

$x = 675.84$