13-14

a) $p = \frac{1}{3}$ parameter

b) CLT says the samp. dist. will be:

- approx. normal $\rightarrow$ $8000\left(\frac{1}{3}\right) \geq 10$ $\quad 8000\left(1-\frac{1}{3}\right) \geq 10$
- centered at $\frac{1}{3}\left(\mu_{\hat{p}} = \frac{1}{3}\right)$
- st. dev. of $\sigma_{\hat{p}} = \sqrt{\frac{\frac{1}{3}\left(1-\frac{1}{3}\right)}{80{,}000}} = .0017$

c) $.3333 \pm 2(.0017) = (.3299, .3367)$

d) huge n = tiny St. dev. = narrow interval

e) $\hat{p} = .316$ statistic

f) $z = \frac{.316 - .3333}{.0017} = -10.18$

g) YES! The $\hat{p} = .316$ is over 10 St. dev. from the mean. $P(z < -10.18) \approx 0$!

Ch. 13 - Review

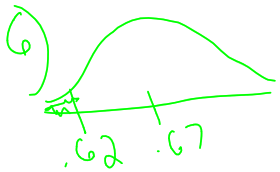
1) $37\% = .37 = \hat{p}$ (stat)
$41\% = .41 = p$ (param)

2) $128 = \mu$ (param)
$126.07 = \bar{x}$ (stat)
$15 = \sigma$ (param)

3) mean of all $\hat{p} = p = .67$

4) st. dev. of all $\hat{p} = \sqrt{\frac{.67(1-.67)}{100}} = .047$

5) approx. normal if n is large:
$np \geq 10$ and $n(1-p) \geq 10$
$100(.67) \geq 10$ $100(1-.67) \geq 10$
$67 \geq 10$ ✓ $33 \geq 10$ ✓

6) 

$z = \frac{.62-.67}{.047} = -1.06$

$P(z < -1.06) = .1446$