Date - 4.18.19
Mr. Aguirre
Math 1342-13

8.2: Distribution of the sample proportion:

∴ sample proportion, $\hat{p}$, is given by $\hat{p} = \frac{x}{n}$.

p = proportion of population that plans to work on vacation.

n = 1200 Adult Americans
552 planed to work on vacation.

$$\hat{p} = \frac{x}{n} = \frac{552}{1200} = 0.46$$

about 46% of population plans to work on vacation.

* Sampling Distribution of $\hat{p}$.

* $np(1-p) \geq 10$.

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

* $\sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}}$

$\boxed{\text{Exercise 3:}}$

$p = 0.76$

$n = 60$

$\hat{p} =$ describe

60 is less than 5% of the population of Adult Americans.

$\therefore$ samples are independent.

is $\hat{p}$ approximately normal?

$np(1-p) \geq 10$

$(60)(0.76)(0.24) \geq 10$

$10.944 \geq 10$

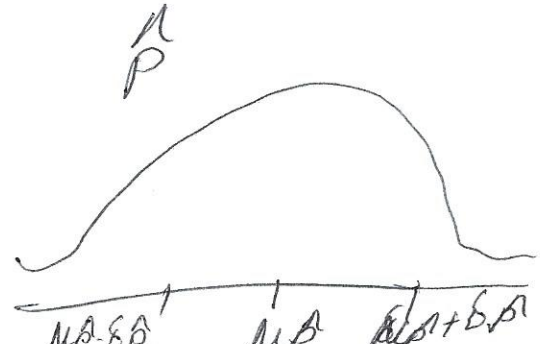
↳ is normal.

$\mu_{\hat{p}} = p = 0.76$

$\sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}} = \sqrt{\frac{(0.76)(0.24)}{60}} = 0.055$

$\boxed{ex4}$

$p = 15\% = 0.15$



(a) $n = 120$

$P(\hat{p} \leq 0.12)$

$np(1-p) \geq 10$

$(120)(0.15)(0.85) \geq 10$

$15.3 \geq 10$

if $\hat{p}$ is approximately normal, we use z-scores and standard normal table.

$\mu_{\hat{p}} = p = 0.15$

$\sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}} = \sqrt{\frac{(0.15)(0.85)}{120}} \approx \boxed{0.033}$

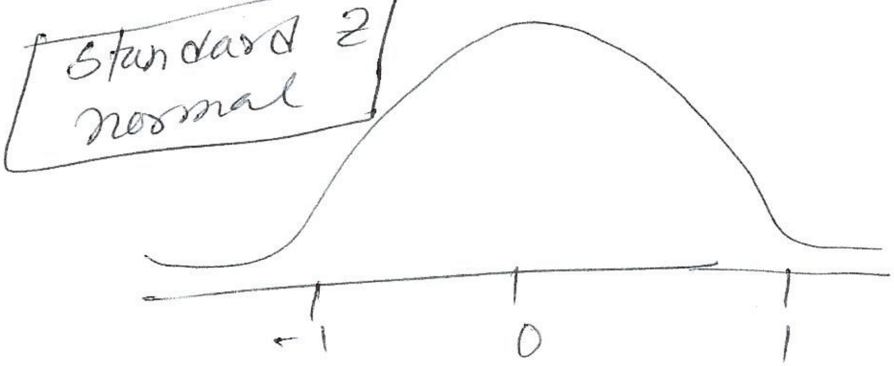
$$z = \frac{x - \mu}{\sigma}$$

$$z = \frac{\hat{p} - \mu_{\hat{p}}}{\sigma_{\hat{p}}}$$

$$z = \frac{(0.12)\ (0.15)}{0.0033}$$

$$z = -0.91$$

from table V, area under curve to the left of $z = -0.91$ is 0.1814



probability that is $\hat{p}$ is no more than 12%. 0.1814 or 18.14%

(b) $n = 120$

$x = 26$ have hearing trouble after listing to headphones.

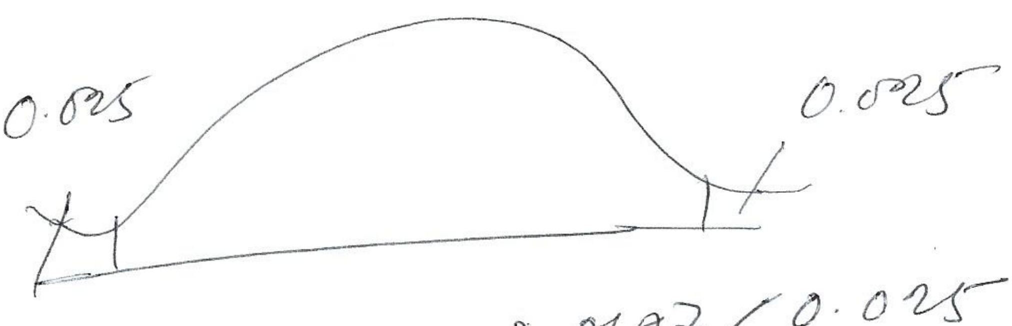
What can we conclude?

$p = 0.15$

$$\hat{p} = \frac{26}{120} = \frac{x}{n} = 0.217$$

$$z = \frac{\hat{p} - \mu_{\hat{p}}}{\sigma_{\hat{p}}} \qquad z = \frac{0.217 - 0.15}{0.033}$$

$$z = 2.06$$



$0.0197 < 0.025$

unusual result for hearing loss.