LESSON 6

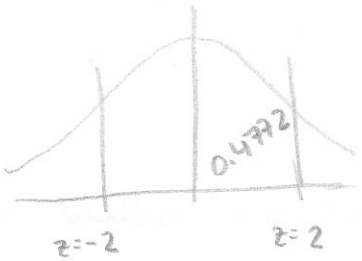
EXERCISE 1

$n = 10$

$\bar{X} = 7$

$S^2 = 9 \rightarrow S = \sqrt{9} = 3$

$\bar{X} - \mu = 2$



$$z = \frac{\bar{X} - \mu}{\sigma_{\bar{x}}} = \frac{2}{1} = 2$$

$$\sigma_{\bar{x}} = \frac{S}{\sqrt{n-1}} = \frac{3}{\sqrt{10-1}} = \frac{3}{3} = 1$$

$$p = 0.4772 \cdot 2 = 0.9544$$

- The probability of finding that the mean of the workers in included in the defined interval is 0.9544

EXERCISE 2

$n = 100$

$p = \frac{70}{100} = 0.7$

$\alpha = 0.05 \rightarrow z = 1.96$

$$p \pm z_{\alpha/2} \sqrt{\frac{p(1-p)}{n}} = 0.7 \pm 1.96 \sqrt{\frac{0,7 \cdot (1-0,7)}{100}} = 0'7 \pm 1.96 \sqrt{\frac{0.21}{100}} =$$

$$= 0'7 \pm 0.09 \begin{cases} 0.79 \\ 0.61 \end{cases}$$

- The percentage of Andalusian that were satisfied with their lives was between 61% and 79%

EXERCISE 3

$n = 150$

$p = \frac{21}{150} = 0.14$

$\alpha = 0.05 \rightarrow z_{\alpha/2} = 1.96$

$$p \pm z_{\alpha/2}\sqrt{\frac{p(1-p)}{n}} = 0.14 \pm 1.96\sqrt{\frac{0.14(1-0.14)}{150}} =$$

$$= 0.14 \pm 0.056 \begin{cases} 0.196 \\ 0.084 \end{cases}$$

- The percentage of Spanish ex-marriages that continue having a friendly relationship is between 8.4 an 19.6%.

EXERCISE 4

$n = 360$

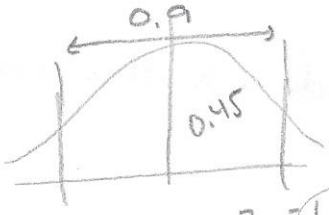
$\bar{X} = 39$

$S^2 = 121 \rightarrow S = \sqrt{121} = 11$

$LC = 0.9 \rightarrow z_{\alpha/2} = 1.645$

$$\bar{X} \pm z_{\alpha/2} \cdot \frac{S}{\sqrt{n-1}} = 39 \pm 1.645 \cdot \frac{11}{\sqrt{360-1}} =$$

$$= 39 \pm 0.96 \begin{cases} 39.96 \\ 38.04 \end{cases}$$



$z_{\alpha/2} = 1.645$ → value obtained in standardized normal table for a probability of 0.45

- Mean in stress of Spanish adults is between 38.04 and 39.96.

Ex 5

$\sigma = 8$

$E = 2$

$\alpha = 0.05 \rightarrow z_{\alpha/2} = 1.96$

$$n = \frac{z_{\alpha/2}^2 \sigma^2}{E^2} = \frac{1.96^2 \cdot 8^2}{2^2} = 61.466 \simeq 62$$

LESSON 7

LESSON 6

Ex 6 (SLIDE 7)

$n = 50$

$\bar{x} = 13.5$

$s^2 = 25 \rightarrow s = 5$

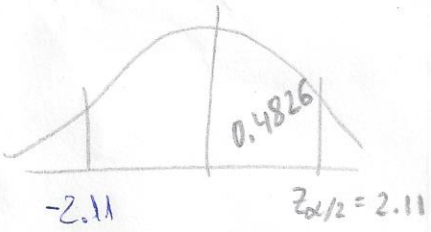
$E = 1.5$

$p = ?$ → 1º, averiguar $z_{\alpha/2}$, luego, buscar en tablas

$$E = z_{\alpha/2} \cdot \sigma_{\bar{x}} \rightarrow 1.5 = z_{\alpha/2} \cdot 0.71 \rightarrow \frac{1.5}{0.71} = z_{\alpha/2}$$

$$2.11 = z_{\alpha/2}$$

$$\sigma_{\bar{x}} = \frac{s}{\sqrt{n-1}} = \frac{5}{\sqrt{50-1}} = 0.71$$



NOTA: Cuando $\alpha = 0.05$, $z_{\alpha/2} = 1.96$ y $p = CL = 0.95$
Aquí es el camino opuesto; sabes E, xo no sabes ni α, ni $z_{\alpha/2}$

$p = 0.4826 \cdot 2 = 0.9652$

Ex 7

$p = 0.4$

$E = 0.03$

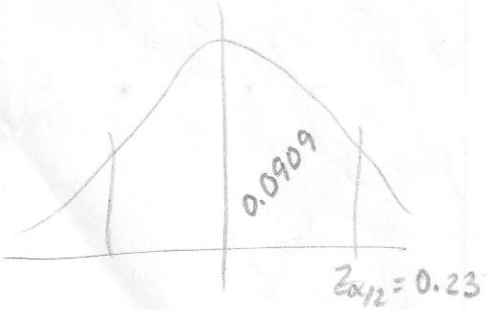
$p = ?$ → 1º, averiguar $z_{\alpha/2}$, luego, buscar en tablas

$n = 15$

$$E = z_{\alpha/2} \cdot \sigma_p \rightarrow 0.03 = z_{\alpha/2} \cdot 0.13 \rightarrow \frac{0.03}{0.13} = z_{\alpha/2}$$

$$0.23 = z_{\alpha/2}$$

$$\sigma_p = \sqrt{\frac{p(1-p)}{n}} = \sqrt{\frac{0.4(1-0.4)}{15}} = 0.13$$



$p = 0.0909 \cdot 2 = 0.1818$