Hoja de trabajo #10

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$\mu = 14$
$\sigma = 2$
$n = 100$
$\bar{x} = 14.5$

a) $$Z = \frac{14.5 - 14}{\frac{2}{\sqrt{100}}} = 2.5$$

$Z = 0.9938$

$1 - Z = 0.0062$

$P(x) = 0.0062$

b)

$Z_{\alpha/2} = 1.96$

$$\frac{\sigma}{\sqrt{n}} = 0.20$$

$$\bar{x} \pm Z_{\alpha/2} * \frac{\sigma}{\sqrt{n}} = (14.11, 14.89)$$

Limite inferior : 14.11
Limite Superior : 14.89

Problema II

$\sigma = 2.5$

$n = 100$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{2.5}{\sqrt{100}} = 0.25$$

$$P(-2 \leq \bar{x} - \mu \leq 2) =$$

$$P\left(\frac{-2}{\frac{1}{4}} \leq z \leq \frac{2}{\frac{1}{4}}\right)$$

$$P(-8 \leq z \leq 8) = 0.999$$

Problema III

$n = 500$

$\bar{x} = 5.4$

$\sigma = 3.1$

$1 - \alpha = .95$

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

$$\frac{\sigma}{\sqrt{n}} = 0.14$$

$$\bar{x} \pm z_{\alpha/2} * \frac{\sigma}{\sqrt{n}} = (5.13, 5.67)$$

Límite inferior: 5.13

Límite Superior: 5.67

Problema IV

$n = 21$

$S = 7.4$

$\bar{y} = 26.4$

$\frac{S}{\sqrt{n}} = 1.61$

$t_{0.025, 20} = 2.086$

$1 - \alpha = 0.95$

Grados de $L = 20$

$\bar{x} \pm t_{\alpha/2} * \frac{S}{\sqrt{n}} = (23.23, 29.97)$

{ Limite inferior: 23.23
{ Limite superior: 29.97

Problema V

$n = 1030$

$Z_{\alpha/2} = 1.645$

$P = 0.78$

$1 - \alpha = 0.90$

$\sigma_p = \sqrt{\frac{\bar{P}(1-\bar{P})}{n}} = 0.013$

$\hat{P} \pm Z_{\alpha/2}\, \sigma_p = (0.74, 0.80)$

a) Limite inferior: 0.74
Limite superior: 0.80

b) No, ya que con un 90% de confianza el mínimo es el 76%

Problema VI

$n_1 = 30$
$n_2 = 30$
$\bar{x}_1 = 167.1$
$\bar{x}_2 = 140.9$
$s_1 = 24.3$
$s_2 = 17.6$
$GL = 29$
$1 - \alpha = 0.95$

a1) $\frac{s}{\sqrt{n}} = 4.44$

$t_{0.025, 29} = 2.045$

$\bar{x} \pm t_{\alpha/2} * \frac{s}{\sqrt{n}} = (158.03, 176.17)$

a2) $\frac{s}{\sqrt{n}} = 3.21$

$t_{0.025, 29} = 2.045$

$\bar{x} \pm t_{\alpha/2} * \frac{s}{\sqrt{n}} = (134.33, 147.47)$

R/ Region I

Limite Inf : 158.03
Limite Sup : 176.17

Region II

Limite inf : 134.33
Limite sup : 147.47