# TP 9

11. $\mu = 16$ [x 100 horas]

$X_{Ai}$ - "Vida de duração de sensores ultrassom"

$$\overline{X_A} = \frac{1}{n} \sum_{i=1}^{n} X_{Ai} \left( 16, \frac{s^2}{n} \right) \text{ [x100 horas]}$$

| classe | Marca | $n_i$ |
|---|---|---|
| 0 - 10 | 5 | 30 |
| 10 - 20 | 15 | 16 |
| 20 - 30 | 25 | 8 |
| 30 - 40 | 35 | 5 |
| 40 - 50 | 45 | 1 |
| | | $n = 60$ |

$$\overline{x}_o = \frac{1}{60} \left( 30 \times 5 + 16 \times 15 + 8 \times 25 + 5 \times 35 + 1 \times 45 \right)$$
$$= 13,5$$

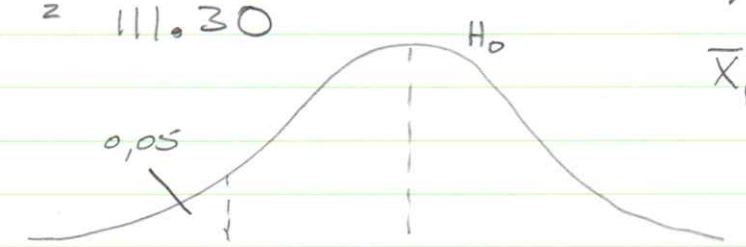
$$s^2 = \frac{1}{n-1} \sum (x_i - \overline{x}_o)^2 \times n_i$$
$$s^2 \tilde{=} (10,55)^2$$

a) $$\overline{X}_A = \frac{1}{n} \sum_{i=1}^{n} X_{Ai} \left( 16, \frac{111,30}{n} \right)$$

$$\begin{cases} 13,5 = \overline{x}_o \\ n = 60 \\ s^2 = 111,30 \end{cases}$$

$H_0 : \mu = 16$
$H_1 : \mu < 16$

$\overline{X}_{H_0} \sim N(16, \frac{111,30}{60})$ " 1,855




| | | |
|---|---|---|
| X | 13,76 | 16 |
| Z | -1,6448 | 0 |

$RC_x$ $]-\infty, 13,76]$ 13,5 Rejeita $H_0$

$RC_z$ $]-\infty, 1,6448]$

TP9

11.

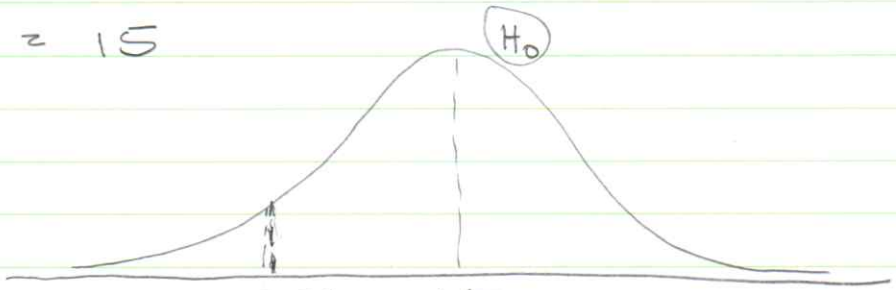
b) $IC_{x?}$ $]-\infty, 13,5]$

$IC_{z?}$ $]-\infty, -1,835]$

$P(\bar{X} \leq 13,5) = 0,033211\overline{5}$

$\alpha = 3,32\%$ $\quad s^2 = 1.854$ ; $s = 1.3619$

c) $\mu_R = 15$




Potencia de la prueba

$Z_0$ $\quad -0,910$

$\beta = P(\text{Aceptar } H_0 \mid H_0 \text{ Falso})$

$= P(\bar{X}_{H_1} \geq 13,76)$ $\quad \mu = 15$

$= 81,87\%$

$1-\beta = P(\text{Rechazar } H_0 \mid H_0 \text{ Falso})$