

# Exemplo 5

$X_i$  - "V.a que representa o PH de umca garrafeira de agave"

$$X_A \sim N(\bar{x}, s^2)$$

$$s^2 \approx s^2 \text{ pq } n \geq 30$$

$$\bar{X}_A = \frac{1}{120} \sum_{i=1}^{120} X_i \sim N\left(\mu, \frac{2,8^2}{120}\right)$$

A.W  
n ≥ 30

a)

$\alpha = 0,01$  - significância

$$\begin{cases} n=120 \\ \bar{x}=6,8 \\ s^2=s^2=2,8^2 \end{cases}$$

$$\bar{X}_A = \frac{1}{120} \sum_{i=1}^{120} X_i \sim N\left(\mu, \frac{7,84}{120}\right)$$

0,0653

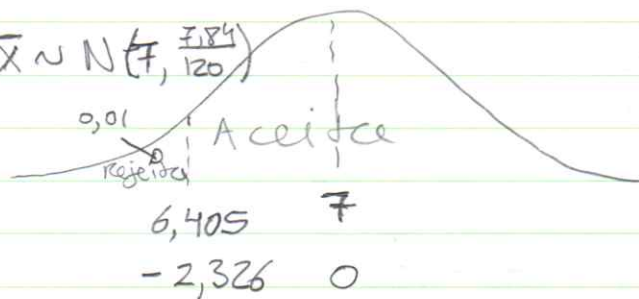
$$H_0: \mu = 7 \rightarrow \bar{X} \sim N\left(7, \frac{7,84}{120}\right)$$

$$H_1: \mu < 7$$

RC

X

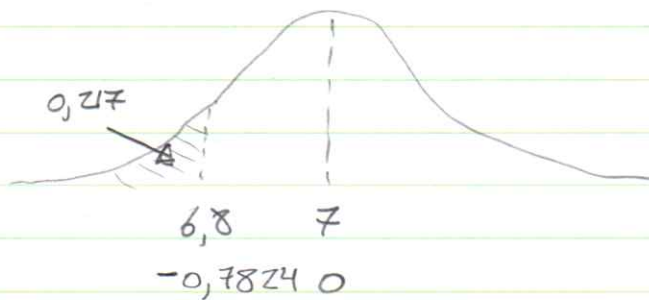
Z



$$\Delta \approx -0,595$$

$$RC_{X_{0,01}} = ] -\infty, 6,405 ]$$

$$RC_{Z_{0,01}} = ] -\infty, -2,326 ]$$



$X_0$

$Z_0$

$$\begin{aligned} \text{p-value} &= 0,217 > 0,01 \notin RC \\ -0,7824 &< -2,326 \notin RC_Z \\ 6,8 &> 6,405 \notin RC_X \end{aligned}$$

aceite - de  $H_0$  com significância de 0,01.

b)

$$X_B \sim \text{i.i.d.}$$

$$\begin{cases} n_B = 50 \\ \bar{x}_B = 7.1 \\ s^2 = 2.1^2 \end{cases}$$

$$\bar{X}_B = \frac{1}{50} \sum_{i=1}^{50} X_i \sim N(\mu_B, \frac{2.1^2}{50})$$

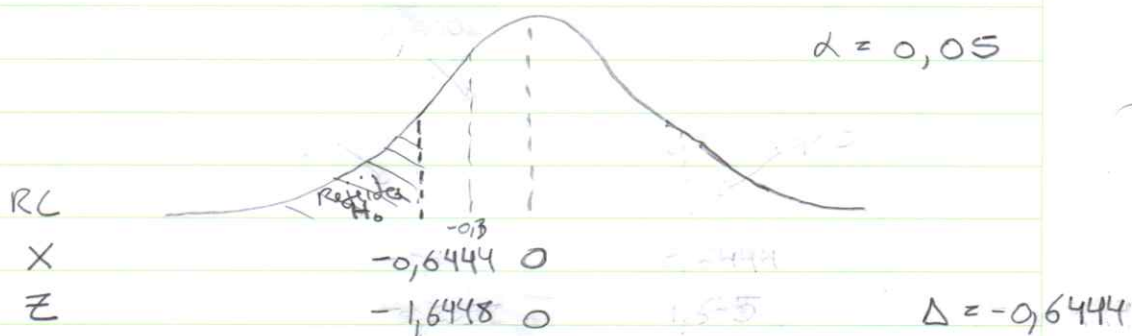
AN 17,30

$$\bar{X}_A \sim N(\mu_A, \frac{7.84}{120})$$

$$\begin{cases} H_0: \mu_A - \mu_B = 0 \\ H_1: \mu_A - \mu_B < 0 \end{cases}$$

$$X_{H_0} = \bar{X}_A - \bar{X}_B \sim N(0, \frac{7.84}{50} + \frac{2.1^2}{120})$$

AN 0,1535



$$RC_x \in ]-\infty, -0,6444]$$

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

$$\bar{x}_A - \bar{x}_B = 6,8 - 7,1$$

$$= -0,3 \rightarrow z_0 = -0,76571$$

$$z_0 \notin RC$$

Não rejeita-se  $H_0$ , logo se pode dizer que não é mais ácido com significância de 0,05.

c) "realidade é sempre o  $H_1$ ".

$$H_0: \mu = 6,93 \rightarrow \bar{X}_{H_0} \sim N(6,93, \frac{7.84}{120})$$

$\alpha = 0,05$

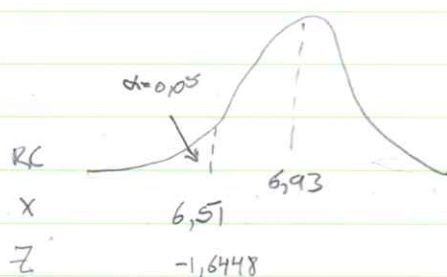
$$H_1: \mu = 6,7$$

$$\beta = \text{Prob}(\text{Aceitar } H_0 \mid H_0 \text{ é Falso})$$

$$P(\bar{X}_{H_1} > c) = 77,13\%$$

$$6,51$$

$$z_0 = -0,743$$



$$\beta = 77,13\%$$

$$\text{poder test} = 1 - \beta = 22,87\%$$