1 - Sejam $X_1, \ldots, X_{10}$ a.a $N(\mu, 20)$. Encontrar o teste MP para testar

$H_0: \mu = 6$ $\quad$ $H_1: \mu = 10$, com nível de significância de 0,05

$$\lambda = \frac{L_0}{L_1} = \frac{\prod_1^{10} \frac{1}{\sqrt{20\pi}} \cdot e^{-\frac{(x-\mu)^2}{20}}}{\prod_1^{10} \frac{1}{\sqrt{20\pi}} \cdot e^{\frac{(x-\mu)^2}{20}}} \leq K$$

$$\left(\frac{20\pi}{20\pi}\right)^{-10/2} \cdot \exp\left(\frac{-\sum (x-6)^2 \cdot (20)^{-1}}{-\sum (x-10)^2 \cdot (20)^{-1}}\right) \leq K$$

$$\exp\left(-\frac{1}{20}\left(\sum_1^{10}(x-6)^2 - \left(\sum (x-10)^2\right)\right)\right)$$

$$\exp\left(\frac{-1}{20}\left(\sum x^2 - 12\sum x + 3600 - \left(\sum x^2 - 20\sum x_i + 10\,000\right)\right) \leq K\right.$$

$$\frac{-1}{20}\left(8\sum x_i - 6400\right) \leq \ln K$$

$$-1(8\sum x_i - 6400) \leq \ln K\, 20$$

$$-8\sum x_i + 6400 \leq 20 \ln K$$

$$-8\sum x_i \leq 20 \ln K - 6400$$

$$\sum x_i \geq \frac{20 \ln K - 6400}{-(8)}$$

$$\bar{X} \geq K'$$

$$P_{0,6}(\bar{X} \geq K') = 0,05$$

$$P\left(\frac{\bar{X} - 6}{1} \geq \frac{K' - 6}{1}\right) = 0,05$$

$\Rightarrow K' - 6 = 1,645$

$K' = 7,645$

Rej $H_0$ caso $\bar{x} \geq 7,645$

2- Verifique se Rejeita $H_0$
a) População Normal, $n = 20$, $\bar{x} = 33$, $s = 9$.
$\alpha = 0,05$ sendo $H_0$: $\mu = 30$ , $H_1$: $\mu < 30$

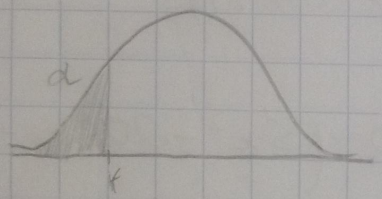
i:

$H_0$: $\mu = 30$ vs $H_1$: $\mu < 30$

ii) Variância desconhecida:

$$t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}} \sim t_{(n-1)}$$

iii) $\alpha = 0,05$




$RC\{T < K\}$
$P(T < K) = 0,05$

Pela Tabela $T_{19} = 1,7291$

iv)

$$T_{obs} = \frac{33 - 30}{9/\sqrt{20}} = 1,4907$$

$RC\{T < 1,4907\}$

Não Rejeita $H_0$

3 Os dados correspondem a uma $B(n, p)$ Retirando uma amostra de 100, se obtive $\hat{p} = 0,80$ e com um $\alpha = 0,05$ deseja-se testar as seguintes hipóteses

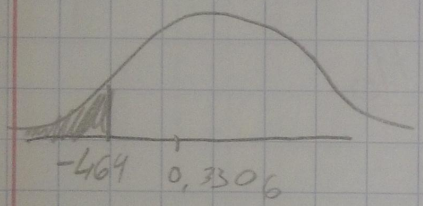
$H_0$ $u = 0,78$ vs $H_1$ $u < 0,78$

i) $H_0$ $u = 0,78$ vs $H_1$ $u < 0,78$

ii) Est de teste

$$\frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{100}}} \rightarrow \frac{0,8 - 0,78}{\sqrt{\frac{p(1-p)}{100}}} \sim N(0,1)$$

iii)
RC para $\alpha = 0,05$




$P(Z < -z) = 0,05$
$P(Z < -1,64)$

$$\frac{0,8 - 0,78}{\sqrt{\frac{0,78(1-0,78)}{100}}} = 0,3306$$

iv) Rejeita $H_0$

4) Sejam $X_1 \dots X_n$ a.a $N(\mu, \sigma^2)$ Foi retirada uma amostra de $n=65$ e $S^2 = 69$ e com um $\alpha = 0{,}05$ Se quer testar as hipoteses $H_0: \sigma^2 = 60$ e $\sigma^2 \neq 60$

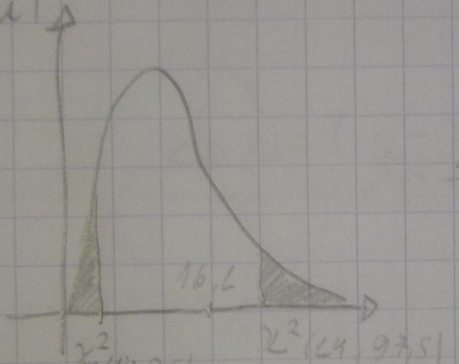
i) $H_0$ $\sigma^2 = 60$ vs $H_1$ $\sigma^2 \neq 60$

ii) Est do teste

$$Q = \frac{(n-1)S^2}{\sigma^2} \sim \chi^2_{(n-1)}$$

$$Q = \frac{(64)(69)}{60} = 76{,}4 \sim \chi^2_{(64)}$$

iii)




$\tilde{N}$ Rej $H_0$