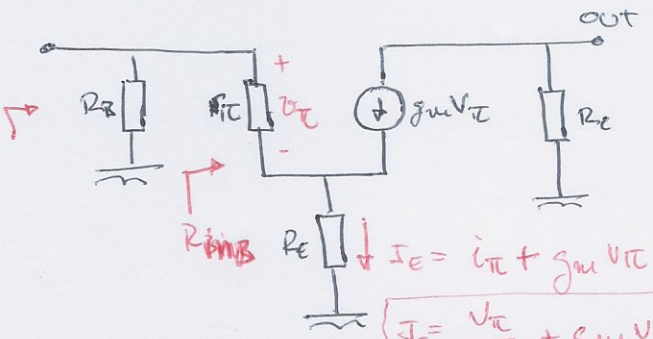
→ Agora precisamos calcular os parâmetros do amplificador. (Rin, Rout, Av)

$$A_V = \frac{V_{out}}{V_{in}}$$



$$V_{RE} = R_E I_E$$

$$\boxed{V_{RE} = R_E b_\pi \left(\frac{1}{r_\pi} + g_m\right)}$$

$$V_{in} = b_\pi + V_{RE}$$

$$\boxed{V_{in} = b_\pi \left[1 + R_E\left(\frac{1}{r_\pi} + g_m\right)\right]}$$

$$\boxed{V_{out} = -g_m b_\pi \cdot R_C}$$

$$I_E = \frac{V_\pi}{r_\pi} + g_m V_\pi$$

$$\boxed{A_V = \frac{V_{out}}{V_{in}} = \frac{-g_m R_C}{1 + \left(\frac{1}{r_\pi} + g_m\right) R_E}}$$

→ Utilizando nossos parâmetros conhecidos, temos que:

$r_\pi = 12,918\,k\Omega$

$g_m = 38,705\,mS$

$R_B = 661,01\,\Omega$

$R_C = 2,2\,k\Omega$

$R_E = 300\,\Omega$

$$|A_V| = \frac{-38,705 \times 10^{-3} \cdot 2200}{1 + \left(\frac{1}{12,918} + 38,705 \times 10^{-3}\right) 300}$$

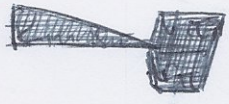
$$* \quad |A_V| = 6,739\ V/V$$

→ Sabemos que:

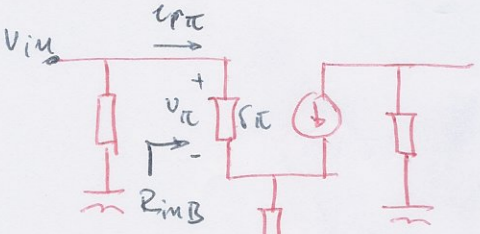
$$R_B = R_{in_B} \,||\, R_{II}$$

conhecemos: $R_B = 661,01\,\Omega$

DEVEMOS calcular



$$i_{r\pi} = \frac{V_\pi}{r_\pi}$$



$$V_{RE} = \left(\underbrace{\frac{b_\pi}{r_\pi}}_{i_{r\pi}} + \underbrace{g_m b_\pi}_{\text{fonte corrente}}\right) R_E$$

$$V_{RE} = b_\pi \left(\frac{1}{r_\pi} + g_m\right) R_E$$

$$V_{in} = b_\pi \left[1 + \left(\frac{1}{r_\pi} + g_m\right) R_E\right]$$

$$R_{in_B} = \frac{b_{in}}{i_{r\pi}}$$

$$\boxed{R_{in_B} = r_\pi \left[1 + \left(\frac{1}{r_\pi} + g_m\right) R_E\right]}$$

$$R_{in_B} = 163,2\,k\Omega$$

$$\boxed{V_{in} = V_\pi + V_{RE}}$$

$$\boxed{R_{in_B} = \frac{V_{in}}{i_{r\pi}}}$$