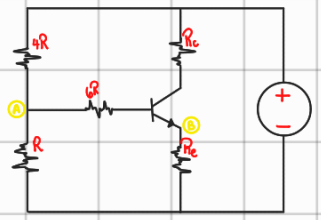
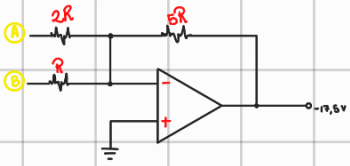
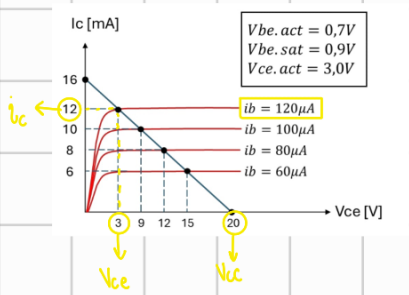
(i) Se tienen 2 circuitos uno transistoriado y otro con amplificador operacional, el segundo depende del primero, se desea obtener una salida de -17,5V calcule los valores de las resistencias: R, R_c y R_e ademas obtener voltaje en (A) y (B)





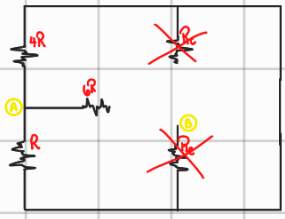


R

R_e

R_c

paso 1 : thevelin :

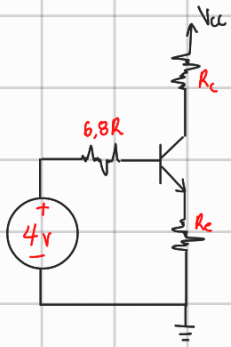


Resistencia th:

$$\Rightarrow \frac{4R \cdot R}{4R+R} + 6R \qquad \frac{4R}{5} + \frac{30R}{5} = \frac{34R}{5} = \boxed{6,8R}$$

Voltaje th :

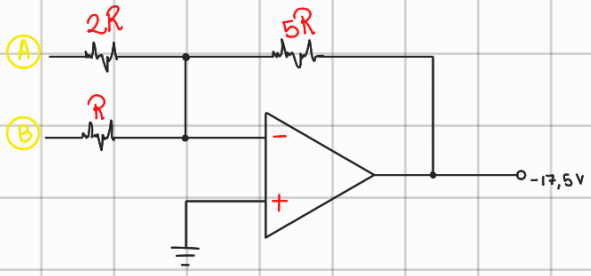
$$\frac{V_{cc} \cdot R}{4R+R} = \frac{V_{cc}}{5}$$; pero V_{cc} : 20 entonces $\boxed{V_{Th} = 4v}$



$$I_c = I_B \cdot \beta$$

$$I_e = I_c + I_B$$

$$V_- = V_+$$



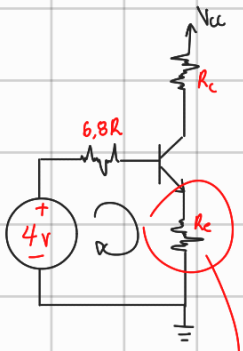
$$i_A + i_B = i_C$$

$$\frac{A}{2R} + \frac{B}{R} = \frac{-V_0}{5R} \quad / \cdot 5R$$

$$2{,}5A + 5B = -V_0$$

$$2{,}5 \cdot 4 + 5B = 17{,}5 \qquad B = \boxed{1{,}5\ V}$$

del transistorizado $i_e = i_C + i_B$



$$i_e = i_B \cdot \beta + i_B$$

$$i_e = i_B (\beta + 1)$$

$$i_e = 120\mu A \cdot \left(\frac{12\ mA}{120\mu A} + 1 \right)$$

$$\frac{V_B}{i_e} = R_e = 124\ \Omega$$

malla colector

$$V_{CC} = i_C \cdot R_C + V_{CE} + B$$

$$\frac{V_{cc} - B - V_{ce}}{I_c} = \frac{20 - 1{,}5 - 3}{12} = \boxed{1292}$$