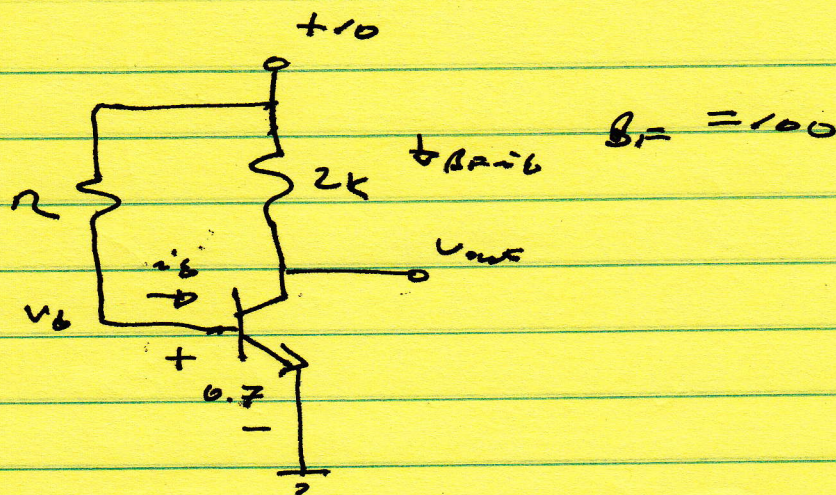


6.30



$$a) \quad 10 = 2i_b + 0.7 \rightarrow i_b = \frac{9.3}{2}$$

$$V_{out} = 10 - 2\beta \left(\frac{9.3}{2} \right)$$

$$R = 470k \rightarrow V_{out} \approx 6V$$

$$b) \quad R_F = 125 \rightarrow V_{out} \approx 7V$$

c) Add 1k emitter resistor

$$V_{out} = 6V \rightarrow i_c = 2mA$$

$$V_b = 2 \times 1 + 0.7 = 2.7V$$

$$i_b = i_c / \beta = 0.02mA$$

$$R = \frac{10 - 2.7}{0.02} = 365k$$

$$d) \quad 10 = 365i_b + 0.7 + \overset{126}{\cancel{100}} i_b \times 1$$

$$\rightarrow i_b = \frac{9.3}{\cancel{465} 491} \approx \cancel{20\mu A} 18.9\mu A$$

$$R_F = 125 \rightarrow i_c = \cancel{1.89mA} 2.37mA$$

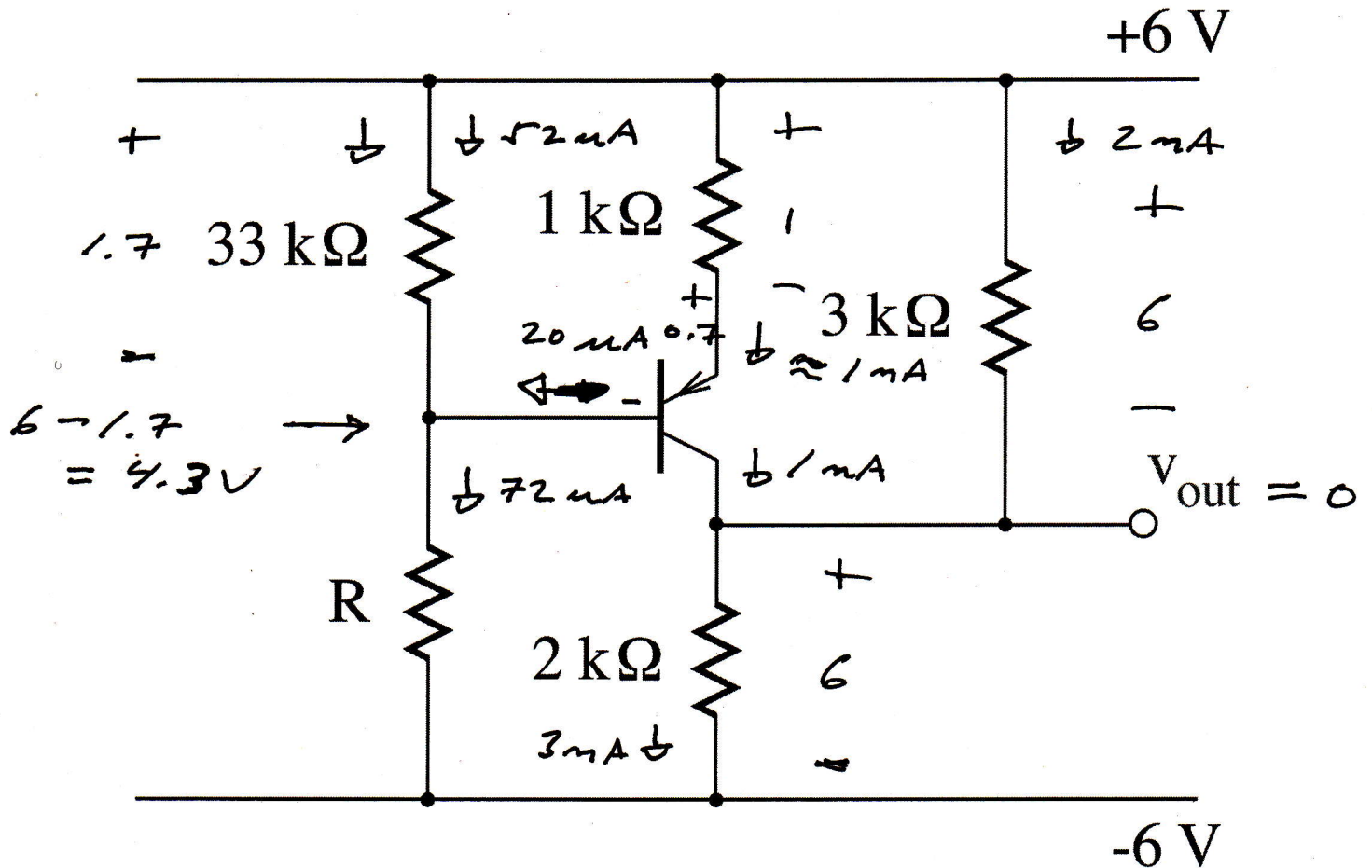
$$V_{out} = \cancel{10 - 2 \times 2.37}$$

$$10 - 2 \times 2.37 = 5.3V$$

6.33 a

$$R_F = 50$$

Mark up diagram.



$$R = \frac{4.3 - (-6)}{0.072} = \underline{\underline{143\text{ k}}}$$

6.33

$$\beta_F = 50$$

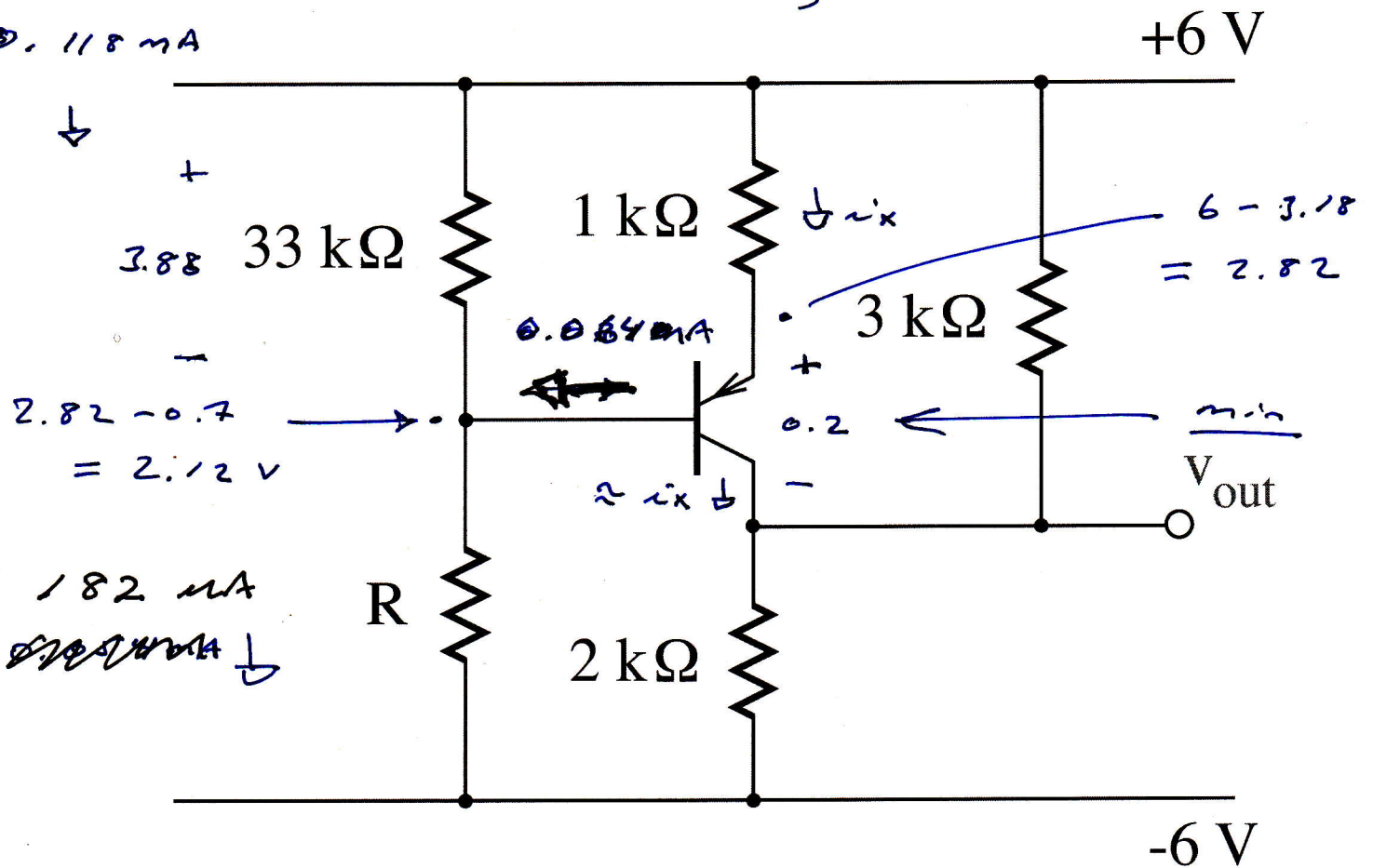
b)

$$i_x = \frac{6 - (v_{out} + 0.2)}{1}$$

$$i_x + \frac{6 - v_{out}}{3} = \frac{v_{out} - (-6)}{2}$$

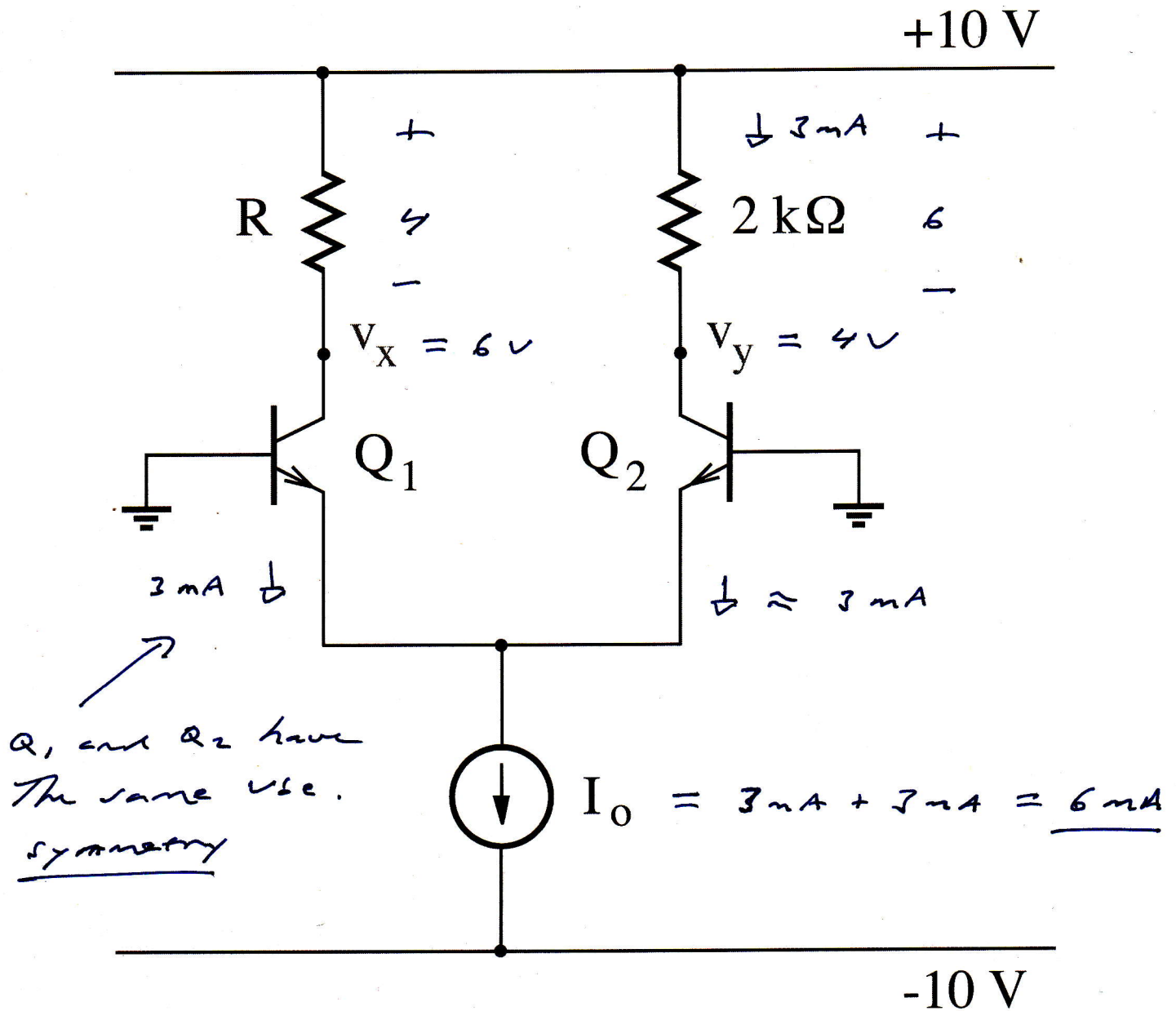
$$\rightarrow v_{out} = 2.62 \text{ V}, \quad i_x = 3.18 \text{ mA}$$

0.118 mA



$$R = \frac{8.12 \text{ V}}{0.182 \text{ mA}} = 44.6 \text{ k}\Omega$$

$$\beta_F = 100$$



$$R = \frac{4\text{ V}}{3\text{ mA}} = 1.33\text{ k}$$