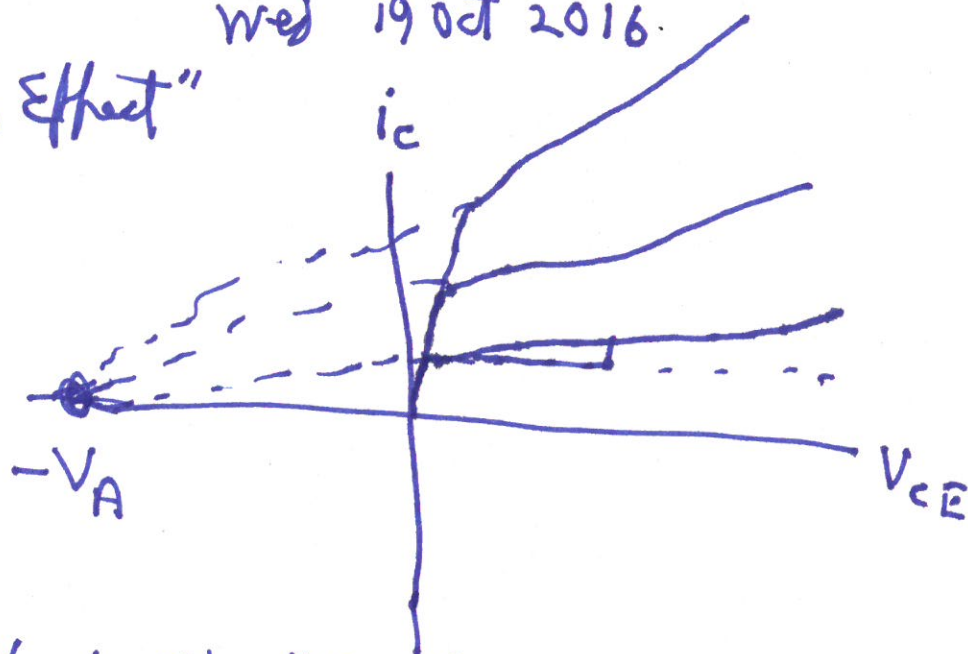


wed 19 Oct 2016.

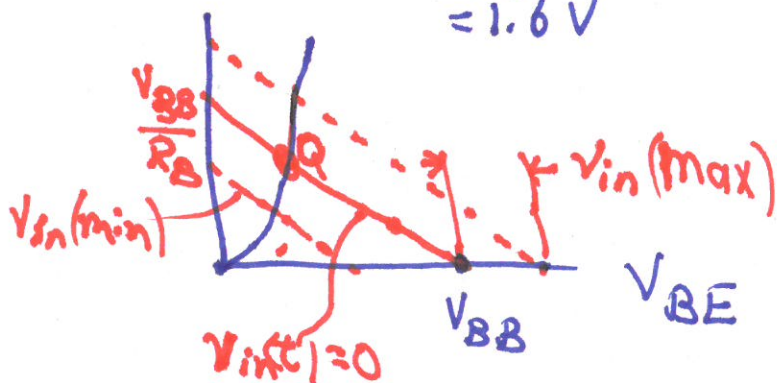
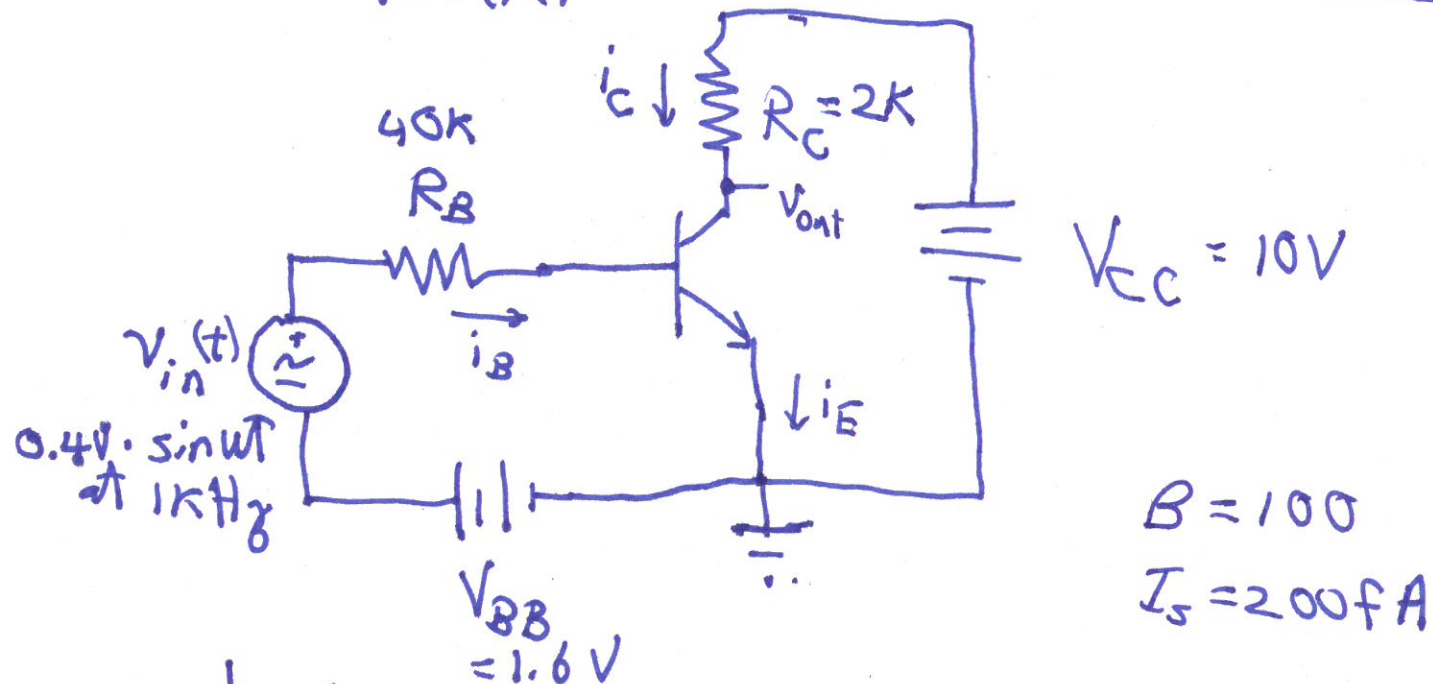
67

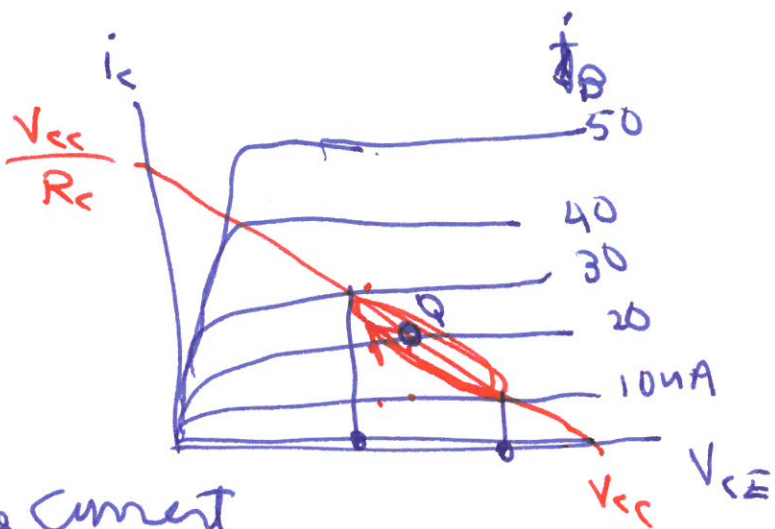
"Early Effect"



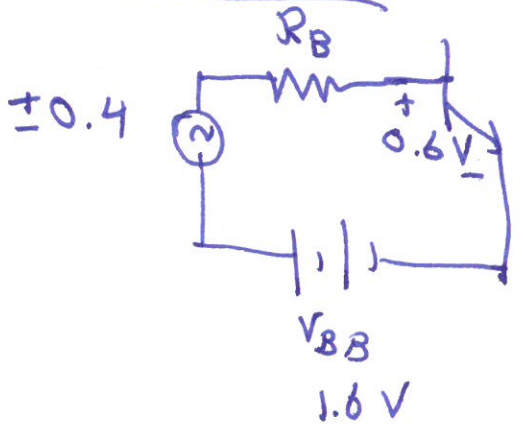
V_A is the "Early Voltage"
ideally $V_A \rightarrow \infty$

CE Amplifier





Base Current



$$i_B = \frac{V_{BB} + V_{in} - 0.6 V}{R_B}$$

$$i_B = \frac{1 \text{ Volt} + \begin{Bmatrix} 0.4 \\ 0 \\ -0.4 \end{Bmatrix}}{40 \text{ k}\Omega} = \begin{Bmatrix} 35 \\ 25 \\ 15 \end{Bmatrix} \mu\text{A}$$

DC $I_B = 25 \text{ } \cancel{\text{mA}} \text{ } \mu\text{A}$

AC $i_b = 10 \text{ } \mu\text{A}$

Collector Current

$$i_c = \beta i_B = \begin{Bmatrix} 3.5 \\ 2.5 \\ 1.5 \end{Bmatrix} \text{ mA}$$

$$I_C = 2.5 \text{ mA}$$

$$i_c = 1 \text{ mA}$$

Collector Voltage

$$V_{CE} = V_{CC} - i_c R_c$$

$$= 10V - i_c \times 2K$$

$$= \begin{Bmatrix} 3 \\ 5 \\ 7 \end{Bmatrix} V$$

DC $V_{CE} = 5 \text{ volts}$

AC $V_{CE} = 2 \text{ volts}$

Gain

$$A_v = \frac{V_{out}}{V_{in}} = \frac{-2V}{0.4V} = -5$$

