

Jaeger 3rd ed.

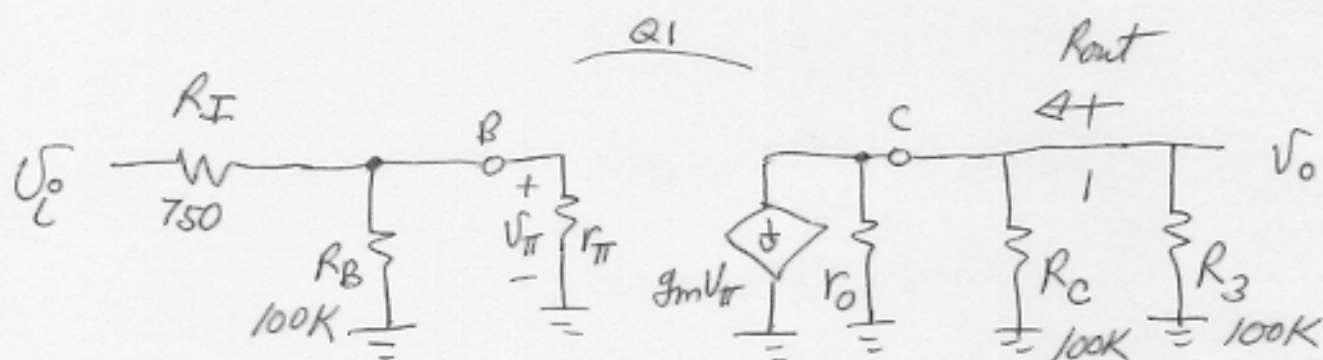
13.60

$$I_C = 50 \mu A$$

$$\beta_0 = 100$$

$$V_{CE} = 10V$$

$$V_A = 75V$$



$$g_m = \frac{I_C}{V_T} = 2 \text{ mS}$$

$$r_o = \frac{V_A + V_{CE}}{I_C} = 1.7 \text{ M}\Omega$$

$$r_{\pi} = \frac{\beta_0}{g_m} = 50 \text{ K}\Omega$$

$$\begin{aligned} A_V \equiv \frac{v_o}{v_i} &= \left( \frac{R_B \parallel r_{\pi}}{R_I + R_B \parallel r_{\pi}} \right) (-g_m) (r_o \parallel R_C \parallel R_3) \\ &= (0.978) (-2 \text{ mS}) (48.57 \text{ K}\Omega) \\ &= -95 \quad (+39.5 \text{ dB}) \end{aligned}$$