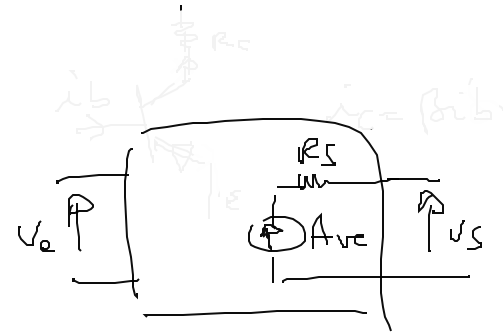
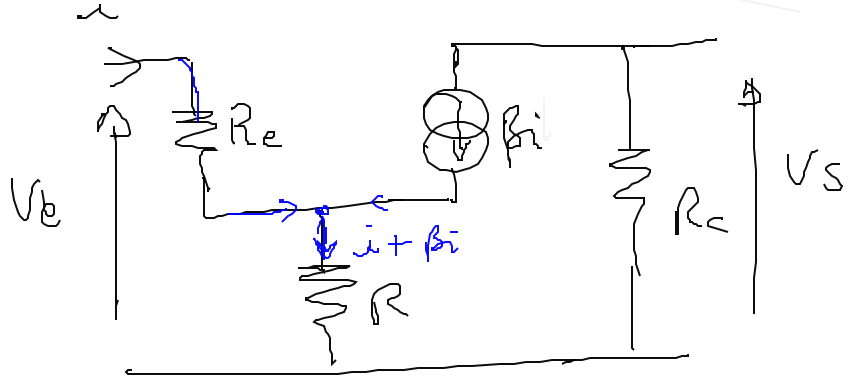
5.1

$$G_0 = -\frac{\beta R_c}{R_e}$$

$i_c = \beta i_b$





$$\left.\begin{aligned} V_s &= -\beta R_c i \\ V_e &= R_e i + R(i+\beta i) \end{aligned}\right\} \quad G = \frac{V_s}{V_e} = -\frac{\beta R_c}{R_e + R(\beta+1)}$$

$\beta = 100 \Rightarrow \beta + 1 \# \beta \Rightarrow G = -\dfrac{\beta R_c}{R_e + \beta R}$

$$G_1 = -\beta\frac{R_c}{R_e} \cdot \frac{1}{\left(1+\frac{\beta R}{R_e}\right)} = G_0 \frac{1}{1+\frac{\beta R}{R_e}} = \frac{G_0}{1+G_0 H}$$

$$G_0 H = \beta\frac{R}{R_e} \Rightarrow H = \frac{\beta R}{R_e} \cdot \frac{R_e}{(-\beta R_c)} = -R/R_c$$