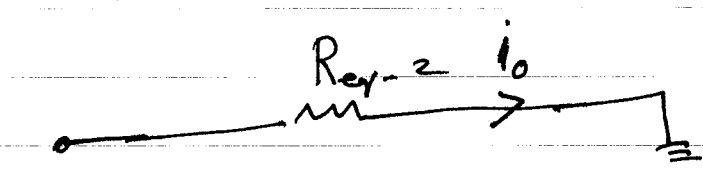
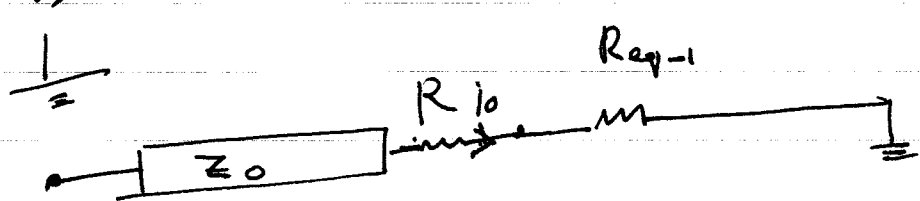
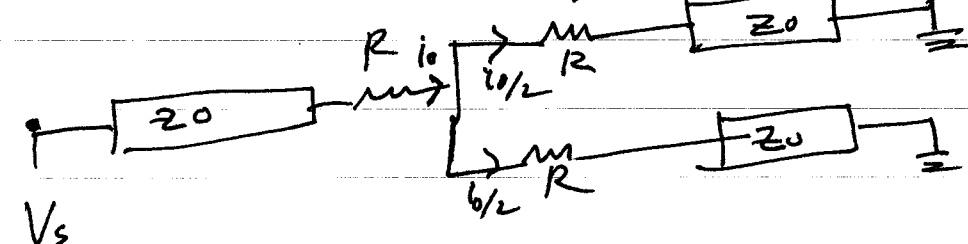
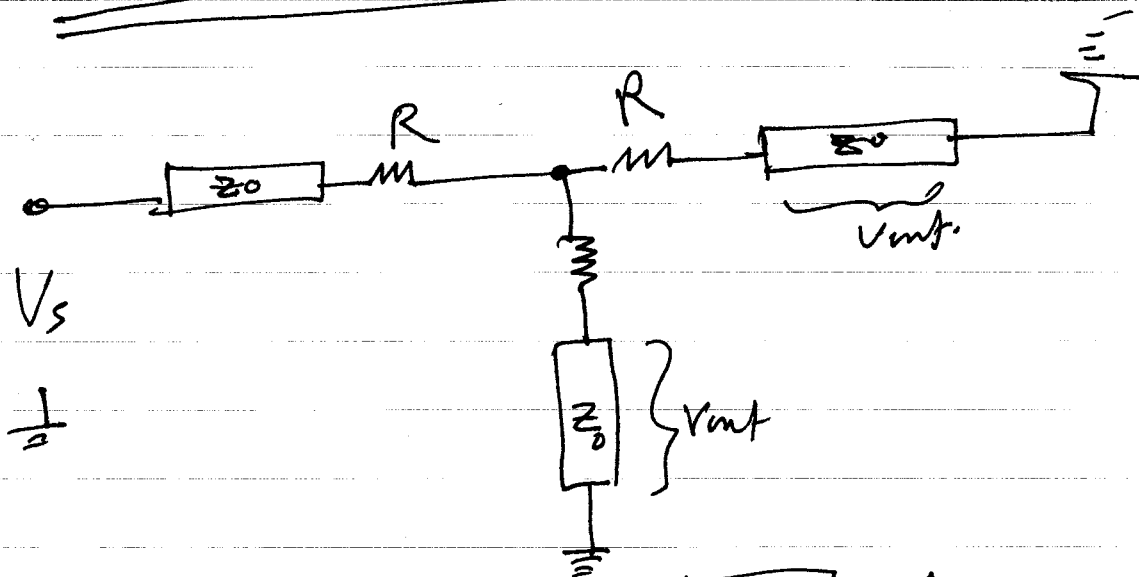


Solution: Problem #16.6 ⇒ G.K. HW #2



$$R_{eq-2} = Z_0 + R + R_{eq-1} = Z_0 + R + \frac{Z_0 + R}{2}$$

$$= \frac{3}{2}(Z_0 + R)$$

$$i_0 = \frac{V_s}{R_{eq-2}} = V_s \times \frac{2}{3} \frac{1}{(Z_0 + R)}$$

$$\text{Then } \frac{V_{out}}{V_s} = \frac{i_0 \times Z_0}{V_s} = \frac{V_s \times \frac{2}{3} \times \frac{1}{(Z_0 + R)} \times Z_0}{V_s} = \frac{Z_0}{3(Z_0 + R)}$$

$$\text{but } \frac{V_{out}}{V_s} = \frac{1}{2} = \frac{Z_0}{3(Z_0 + R)} \Rightarrow 3(Z_0 + R) = 2Z_0$$

$$|R| = \frac{3Z_0 - 2Z_0}{3} = \frac{Z_0}{3} = \frac{50}{3} = 16.66 \Omega$$