

$$R_{in} = \frac{V_T}{i_T}$$

$$R_{in} = \frac{V_T}{i_T} = \frac{V_T}{i_A + \frac{V_T}{1000[\Omega]}}$$

$$i_A = \frac{V_T}{1000[\Omega]}$$

$$V_T$$

$$\left(\frac{V_T}{1000[\Omega]} \right) + \left[\left(50 \left(\frac{V_T}{1000[\Omega]} \right) \left(\frac{1000[\Omega]}{3200[\Omega]} \right) \right) + \left(50 \left(\frac{V_T}{1000[\Omega]} \right) \left(\frac{2200[\Omega]}{3200[\Omega]} \right) \right) \right]$$

$$50 \left(\frac{V_T}{1000[\Omega]} \right) = R_{in} =$$

$$V_T$$

$$\left(\frac{V_T}{1000[\Omega]} \right) + \left[V_T \left[\left(\frac{50}{1000[\Omega]} \right) \left(\frac{1000[\Omega]}{3200[\Omega]} \right) + \left(\frac{50}{1000[\Omega]} \right) \left(\frac{2200[\Omega]}{3200[\Omega]} \right) \right] \right]$$

$$\left(\frac{50}{1000[\Omega]} \right)$$

$$= 1000[\Omega]$$