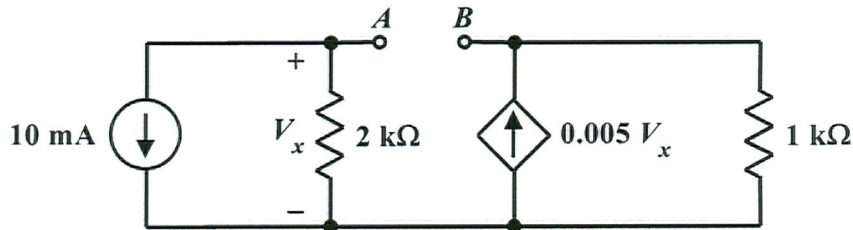
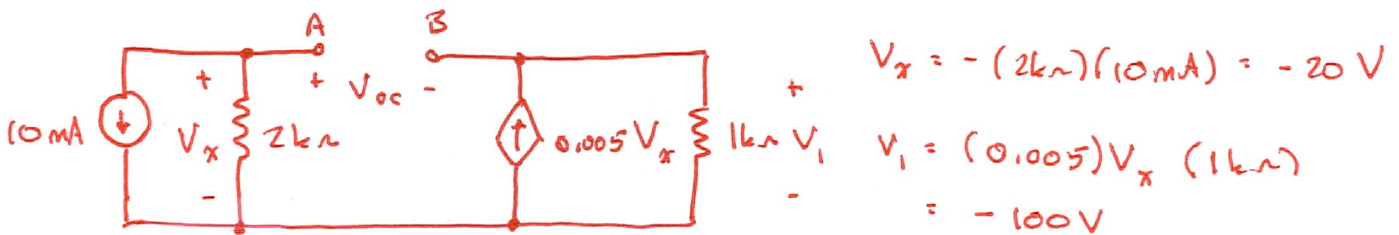


Homework Problem #33



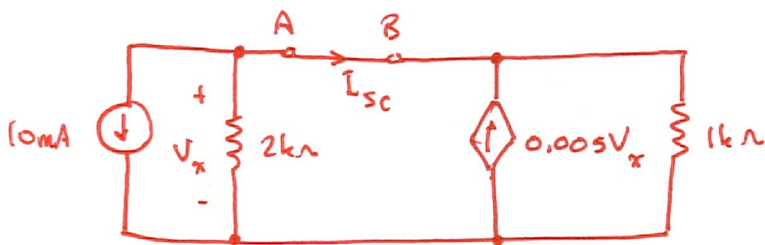
a. Find the Thévenin equivalent with respect to terminals A and B .



$$V_x = -(2\text{k}\Omega)(10\text{mA}) = -20\text{V}$$

$$V_1 = (0.005)V_x (1\text{k}\Omega) = -100\text{V}$$

$$V_{oc} = V_x - V_1 = 80\text{V}$$



$$10\text{mA} + \frac{V_x}{2\text{k}\Omega} - 0.005V_x + \frac{V_x}{1\text{k}\Omega} = 0$$

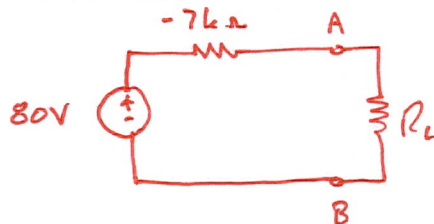
$$\Rightarrow 0.0035 V_x = 10\text{mA}$$

$$V_x = \frac{20}{7}\text{V}$$

$$I_{sc} = -10\text{mA} - \frac{V_x}{2\text{k}\Omega} = -\frac{80}{7}\text{mA}$$

$$V_T = V_{oc} = 80\text{V}, \quad R_T = \frac{V_{oc}}{I_{sc}} = \frac{80\text{V}}{-80/7} \times 10^3 = -7\text{k}\Omega$$

b. If connected between terminals A and B , what value of R_L will absorb maximum power from the remainder of the circuit?



According to the Maximum Power Transfer Theorem,

$R_L = R_T = -7\text{k}\Omega$ will absorb maximum power.

But a negative resistor doesn't satisfy the PSC and, therefore, doesn't absorb power. We cannot answer the question as posed.