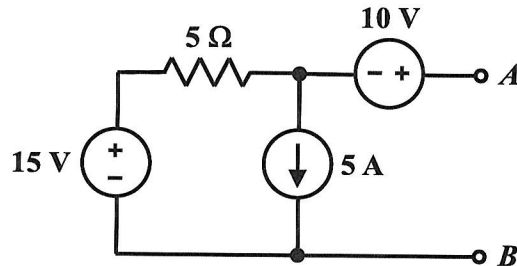
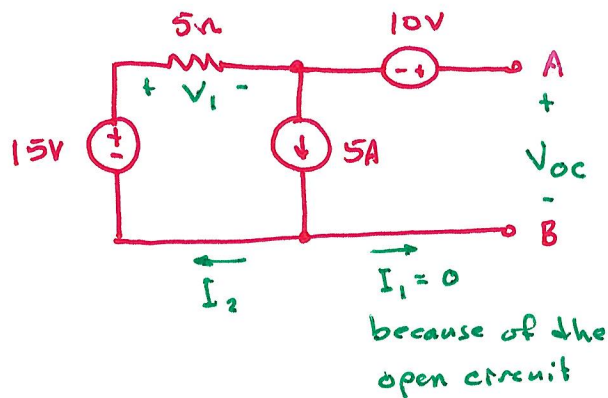


EE 2240
Homework Problem #036



Determine the Thévenin equivalent circuit with respect to terminals A and B .

Under open-circuit conditions:

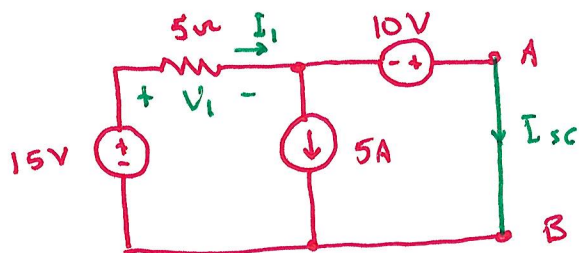


$$I_2 = 5A - I_1 = 5A \quad (\text{KCL})$$

$$V_1 = (5\Omega)I_2 = 25V$$

$$V_{oc} = 10V - V_1 + 15V = 0V$$

Under short-circuit conditions:



$$V_1 = 15V + 10V = 25V$$

$$I_1 = \frac{V_1}{5\Omega} = 5A$$

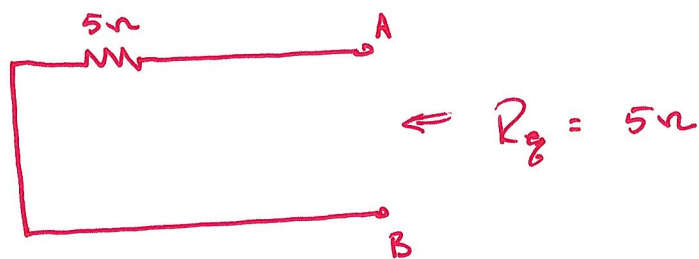
$$I_{sc} = I_1 - 5A = 0A$$

$$V_T = V_{oc} = 0V$$

$$R_T = \frac{V_{oc}}{I_{sc}} = \frac{0V}{0A} \text{ is undefined.}$$

So, how can we find the Thévenin resistance?

Turn off all independent sources and then calculate the equivalent resistance between terminals A and B:



$$R_T = R_g = 5\Omega$$

So, we have the following Thévenin equivalent circuit:

