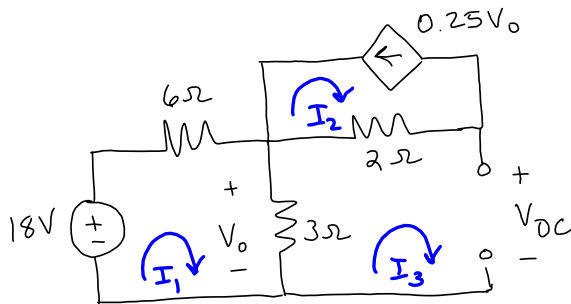


Find R_L for maximum power.

$$R_L = R_{TH} = \frac{V_{OC}}{I_{SC}}$$



Know

$$I_2 = -0.25V_0$$

$$I_3 = 0$$

$$V_0 = 3(I_1 - I_3)$$

$$V_0 = 3I_1$$

$$m1: 18 - 6I_1 - 3(I_1 - I_3) = 0$$

$$-9I_1 = -18$$

$$I_1 = 2A$$

$$V_0 = 6V$$

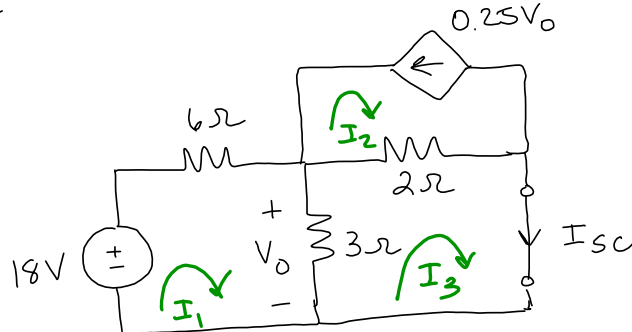
$$I_2 = -0.25V_0$$

$$= -1.5A$$

$$m3: -3(I_3 - I_1) - 2(I_3 - I_2) - V_{OC} = 0$$

$$6 - 3 - V_{OC} = 0$$

$$\boxed{V_{OC} = 3V}$$

Find I_{sc} Know

$$\begin{cases} V_0 = 3(I_1 - I_3) \\ I_2 = -0.25V_0 \end{cases}$$

$$I_{sc} = I_3$$

$$m1: 18 - 6I_1 - 3(I_1 - I_3) = 0$$

$$m3: -3(I_3 - I_1) - 2(I_3 - I_2) = 0$$

$$I_2 = -0.25(3(I_1 - I_3))$$

$$I_2 = -.75I_1 + .75I_3$$

$$-9I_1 + 3I_3 = -18$$

$$3I_1 + 2I_2 - 5I_3 = 0$$

$$.75I_1 + I_2 - .75I_3 = 0$$

$$I_3 = 1A \quad I_2 = -1A$$

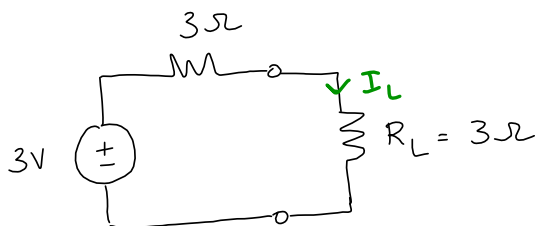
$$I_1 = 2.33A$$

$$I_{sc} = I_3 = 1A$$

$$R_{TH} = \frac{V_{oc}}{I_{sc}} = \frac{3}{1} = 3\Omega$$

 $R_L = R_{TH}$ for max power.

$$R_L = 3\Omega$$

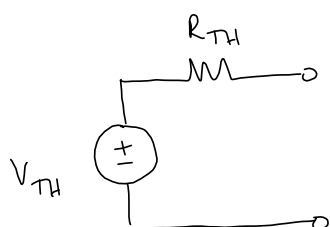


$$I_L = \frac{3}{6} = 0.5A$$

$$\begin{aligned} P_L &= I_L^2 \cdot R_L \\ &= (0.5)^2 (3) \\ &= 0.75W \end{aligned}$$

Quiz 3: Wednesday, March 4th
Thevenin Eq ccts
Maximum power transfer.

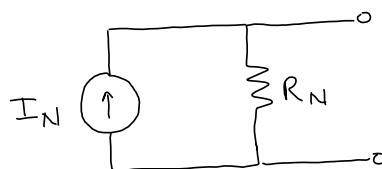
Norton Equivalent.



$$R_{TH} = \frac{V_{OC}}{I_{SC}}$$

$$I_{SC} = 1 \text{ A}$$

$$R_{TH} = 3 \Omega$$



$$I_N = I_{SC}$$

$$R_N = \frac{V_{OC}}{I_{SC}}$$

$$I_{SC} = \frac{V_{OC}}{R_N}$$

