National University

faculty of Engineering and Architecture

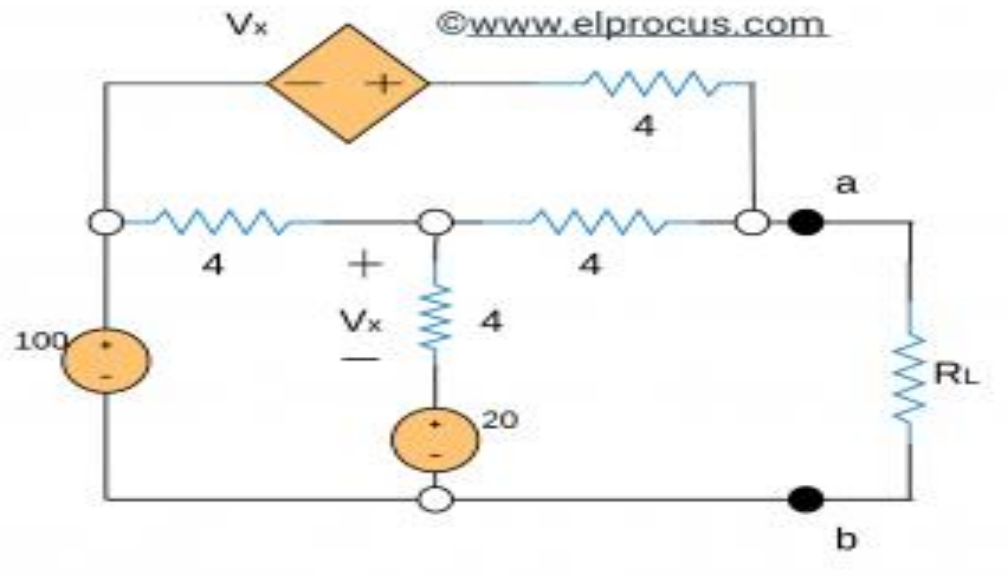
Maximum Power Transfer Theorem

Introduction:

- The Maximum Power Transfer Theorem can be defined as, a resistive load is connected to a DC-network, when the load resistance (RL) is equivalent to the internal resistance then it receives highest power is known as Thevenin's equivalent resistance of the source network.

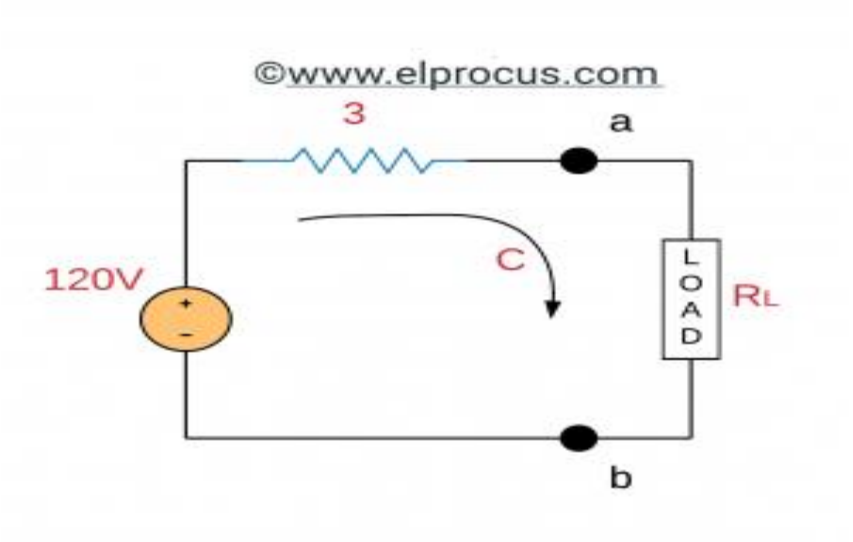
Example:

Find the load resistance RL that enables the circuit to deliver maximum power toward the load. Also, find the maximum power delivered to the load.



Solution:

1- find the Thevenin's equivalent circuit using nodal analysis:



Continue:

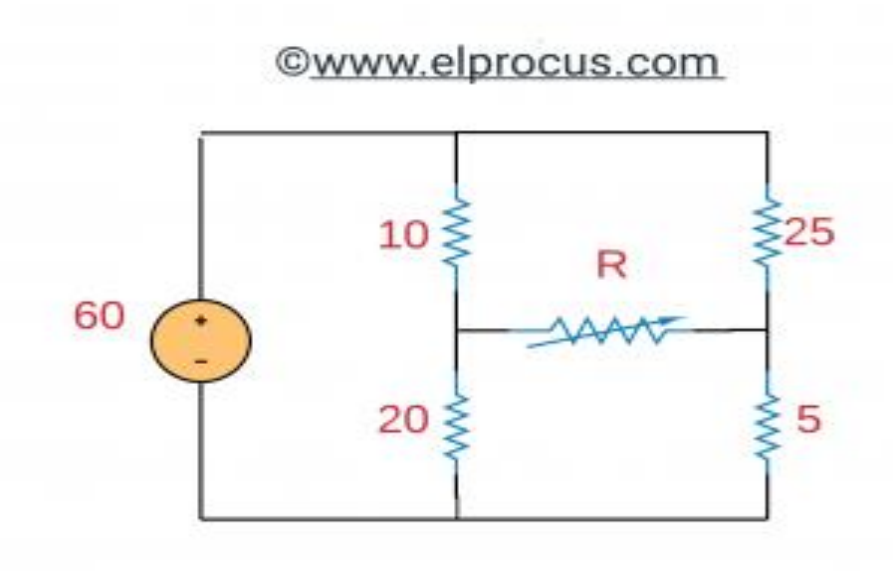
2- RL=Rth

3- the maximum power transferred to RL is:

$$i^2 R_L = \left(\frac{120}{6}\right)^2 \cdot 3 = 1200\,[\mathrm{W}]$$

Example:

- **Determine the maximum power that can be delivered to the variable resistor R.**



Solution:

- 1- Thevenin's equivalent circuit: