

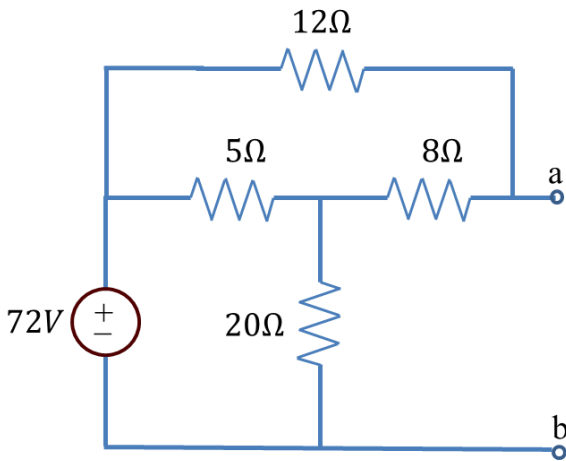
**Thevenin Equivalents:** Voltage source  $V_{th}$  in series with resistance  $R_{th}$ .  $V_{th}$  is the open circuit voltage, and  $R_{th}$  is the equivalent resistance.  $V_{th}$  is also the short circuit current times  $R_{th}$ .

**Norton Equivalents:** Current source  $I_n$  is parallel with resistance  $R_n$ .  $I_n$  is the short circuit current, and  $R_n$  is the equivalent resistance.  $I_n$  is also the open circuit voltage divide by  $R_n$ .

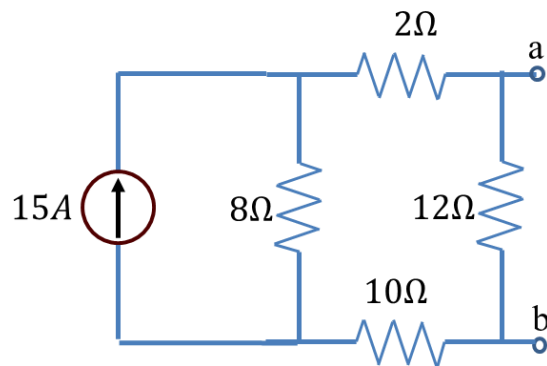
**Source Transformations:** A Thevenin-type source can be converted to a Norton-type source and vice versa with the equation:  $V_{th} = I_n R$

**Maximum Power Transfer:** The maximum power transferred to a load is found when the load resistance is equal to the Thevenin equivalent resistance.

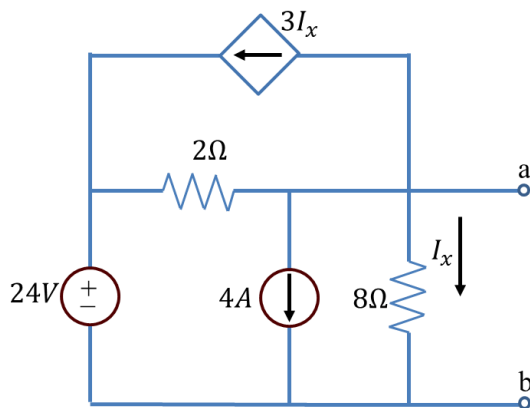
Example 1: Find the Thevenin equivalent



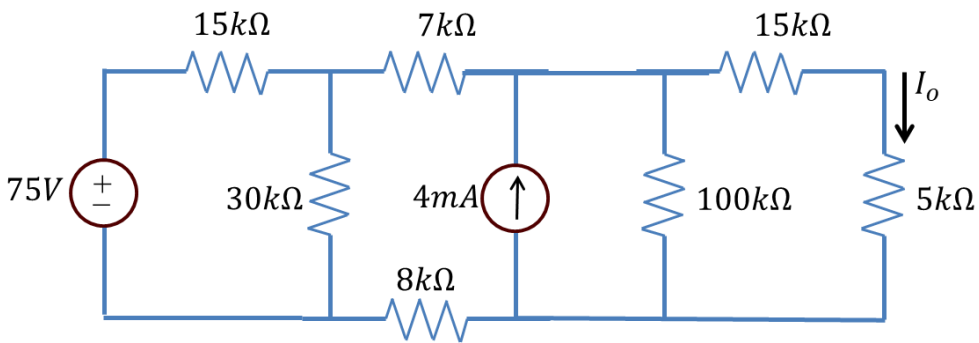
Example 2: Find the Norton equivalent



Example 3: Find the Thevenin equivalents

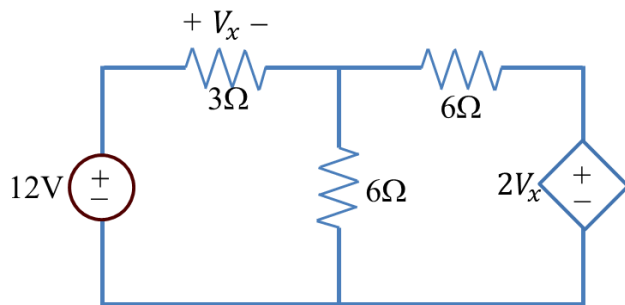


Example 4: Use source transformations to solve for the current in the  $5k\Omega$  resistor




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Example 5: Use source transformations to solve for  $V_x$ . Note:  $V_x$  must be preserved



Example 6: Find  $R_L$  that maximizes power transfer to the load. What is the maximum power transferred?

