NORTON'S THEOREM

CIRCUIT ANALYSIS METHOD

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TOPIC OUTLINE

Norton's Theorem

NORTON'S THEOREM

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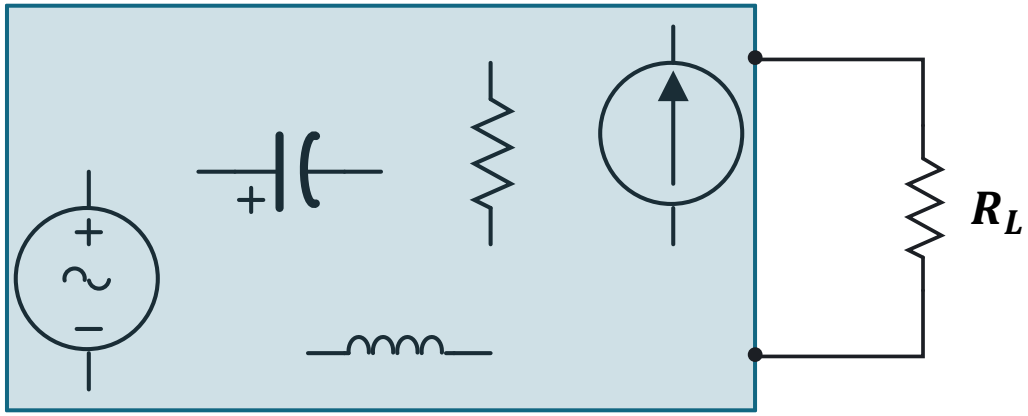
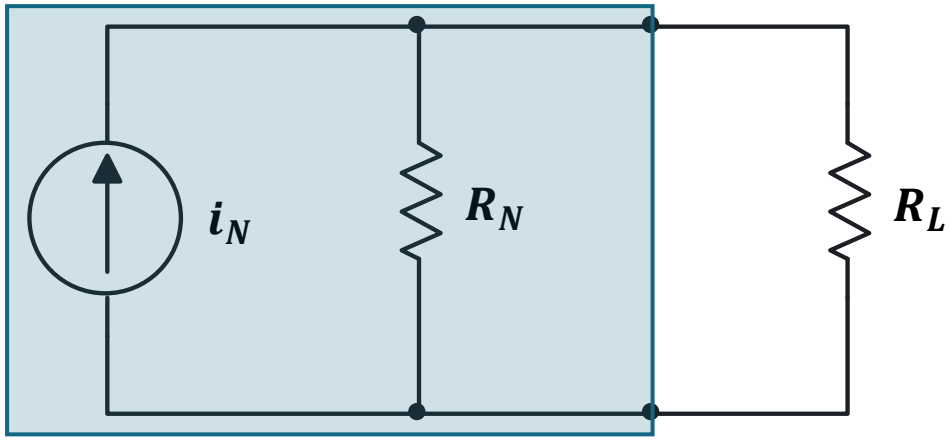
It is possible to simplify any **linear circuit**, irrespective of how complex it is, to an equivalent circuit with a single current source, i_N and a parallel resistance, R_N.

Arbitrary Network:

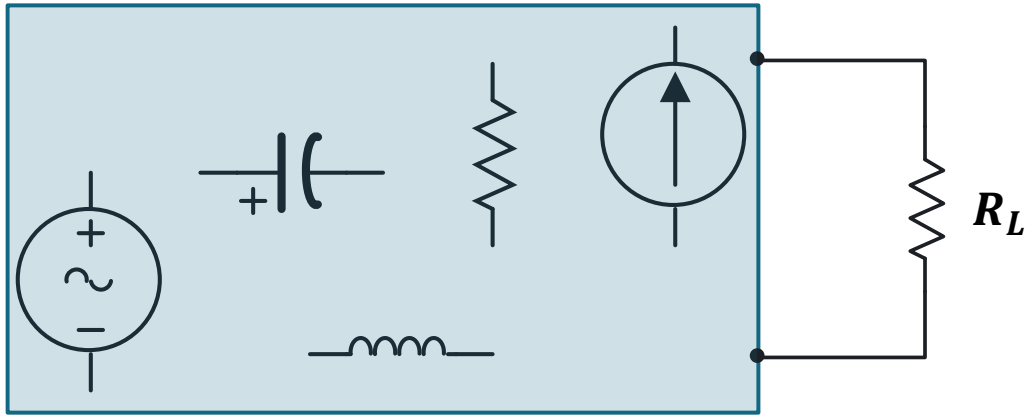


NORTON'S THEOREM

Norton's Equivalent Circuit:

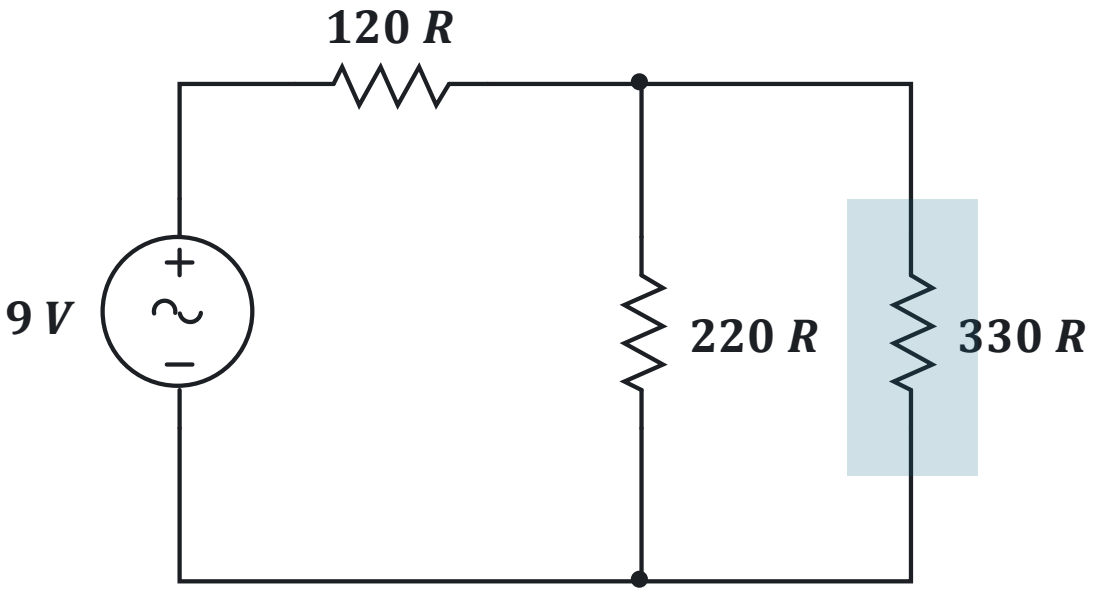


Arbitrary Network:



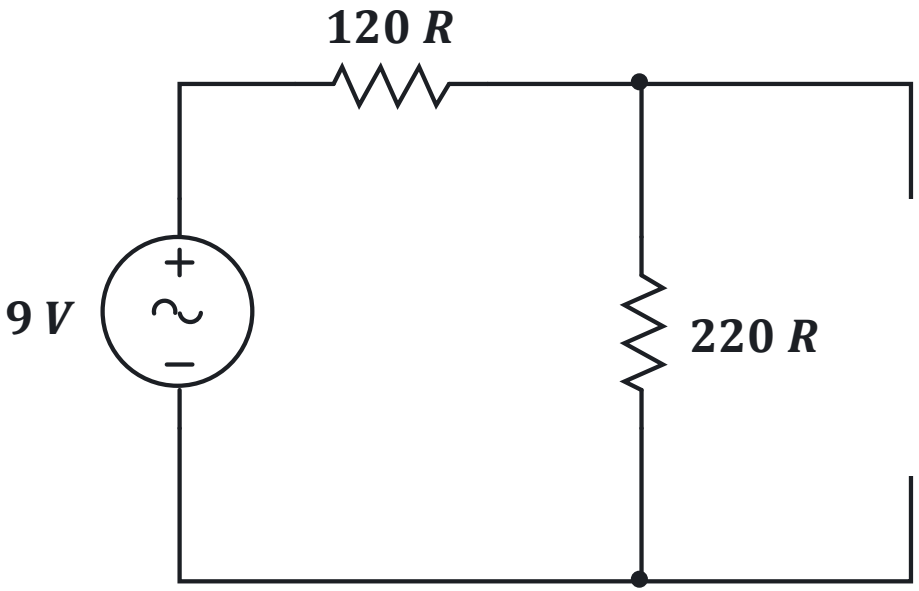
STEPS TO APPLY NORTON'S THEOREM

1. Identify the load.

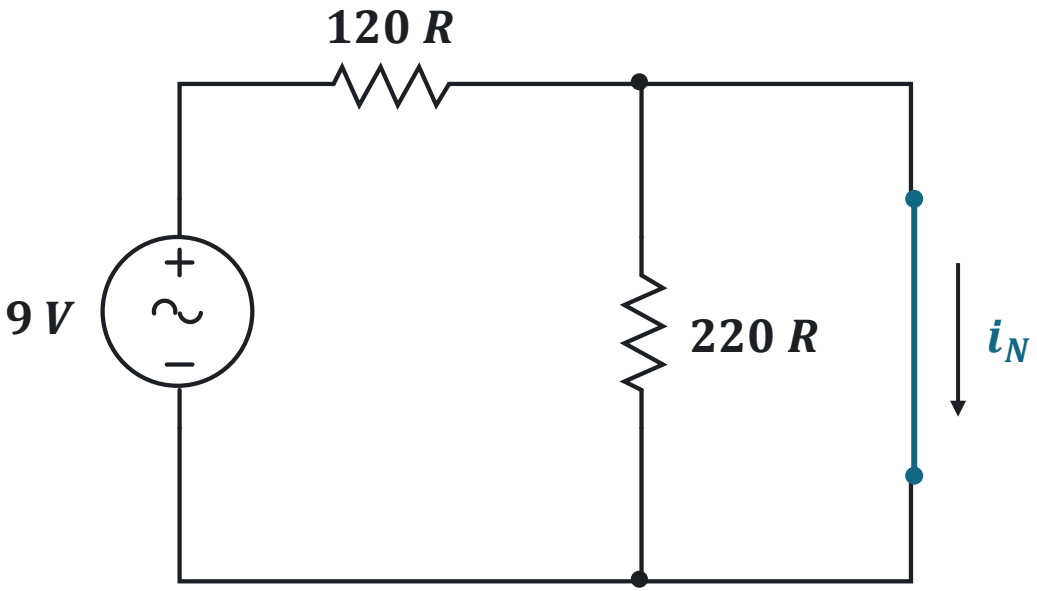


STEPS TO APPLY NORTON'S THEOREM

1. Identify the load.
2. Remove the load



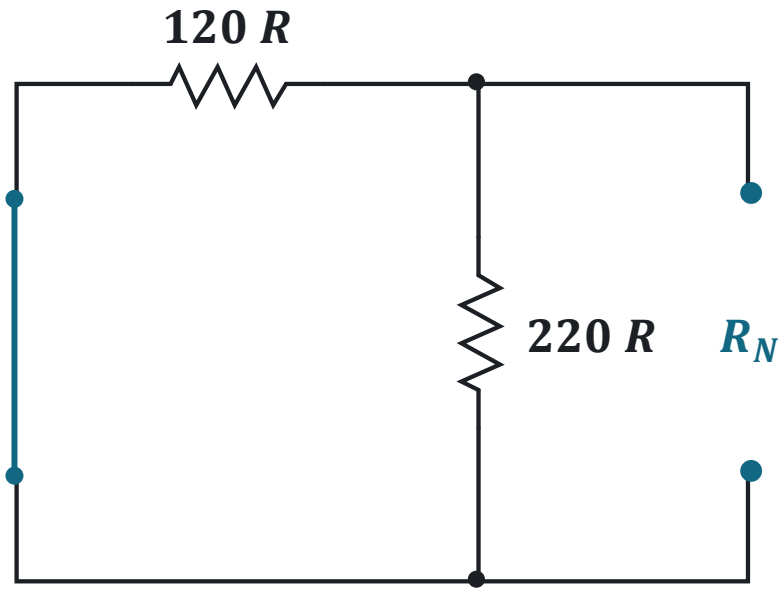
STEPS TO APPLY NORTON'S THEOREM



1. Identify the load.
2. Remove the load
3. Determine the Norton current, i_N:

Calculate the **short-circuit current** flowing through the shorted terminals where the load was connected.

STEPS TO APPLY NORTON'S THEOREM



1. Identify the load.
2. Remove the load
3. Determine the Norton current, i_N:

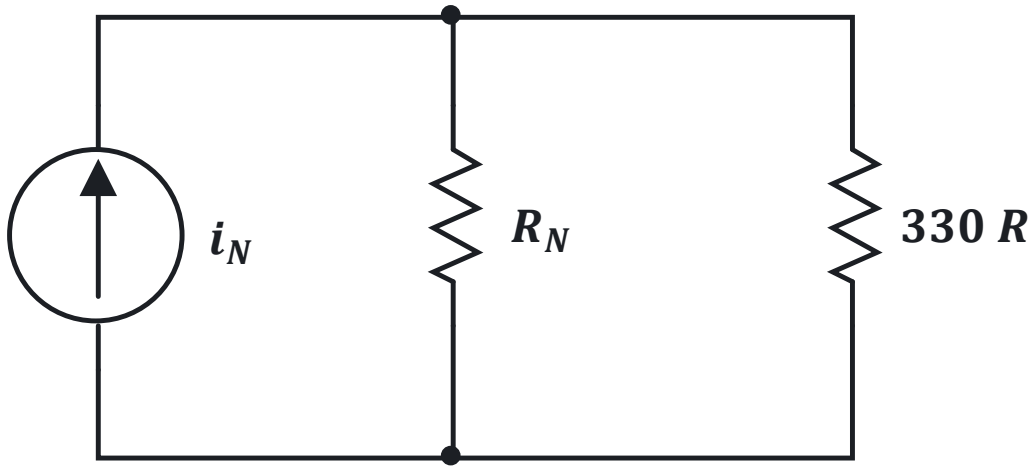
Calculate the **short-circuit current** flowing through the shorted terminals where the load was connected.

4. Determine the Norton resistance, R_N:

Set all independent **sources to zero** and calculate the equivalent resistance looking into the terminals where the load was connected.

STEPS TO APPLY NORTON'S THEOREM

Norton Equivalent Circuit

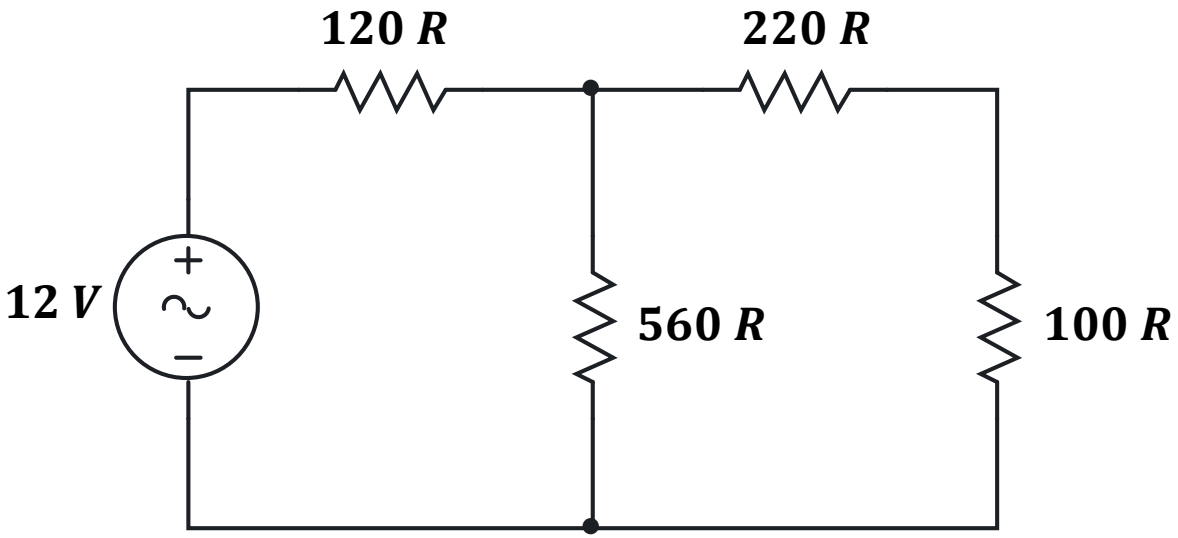


1. Identify the load.
2. Remove the load
3. Determine the Norton current, i_N:
Calculate the **short-circuit current** flowing through the shorted terminals where the load was connected.
4. Determine the Norton resistance, R_N:
Set all independent **sources to zero** and calculate the equivalent resistance looking into the terminals where the load was connected.
5. Replace the original circuit with **Norton equivalent** and reconnect the load.

EXERCISE

Determine the load **current**, load **voltage**, and **total power** of the given circuit.

Solution:



LABORATORY