THEVENIN'S THEOREM

BASIC CIRCUIT ANALYSIS METHOD

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TOPIC OUTLINE

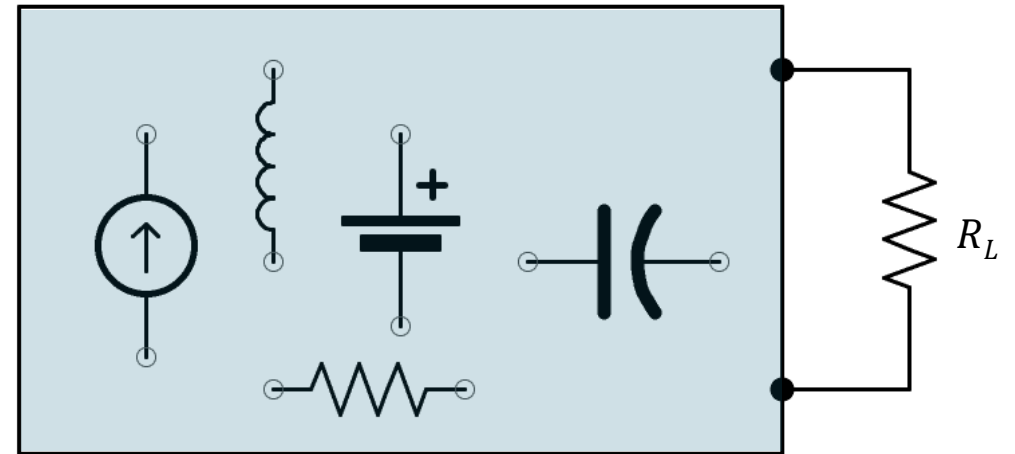**Thevenin's Theorem**

THEVENIN'S THEOREM

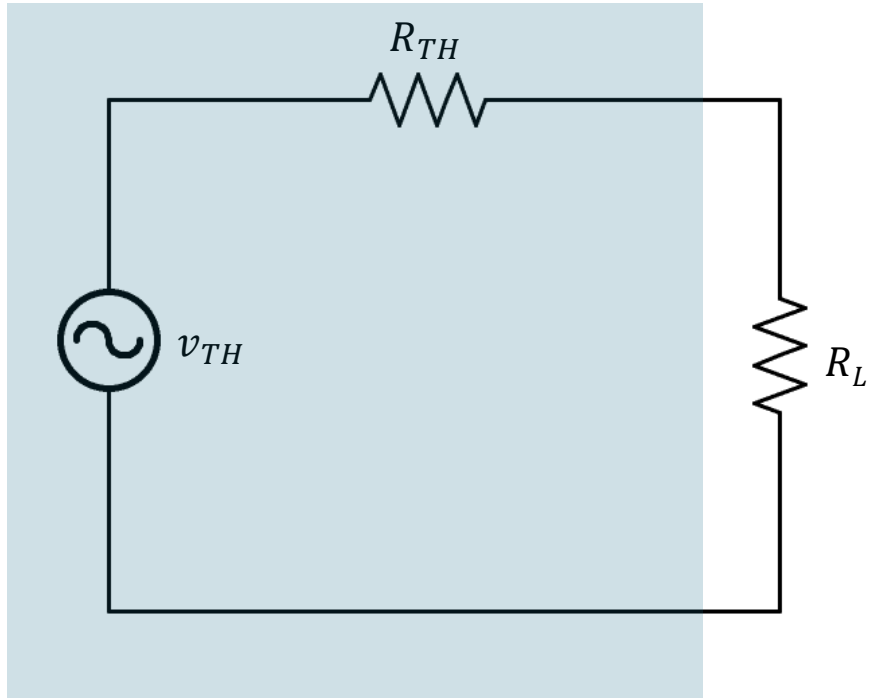# THEVENIN'S THEOREM

Arbitrary Network

Thevenin's theorem states that it is possible to simplify any **linear circuit**, irrespective of how complex it is, to an equivalent circuit with a single voltage source (v_{TH}) and a series resistance (R_{TH}).
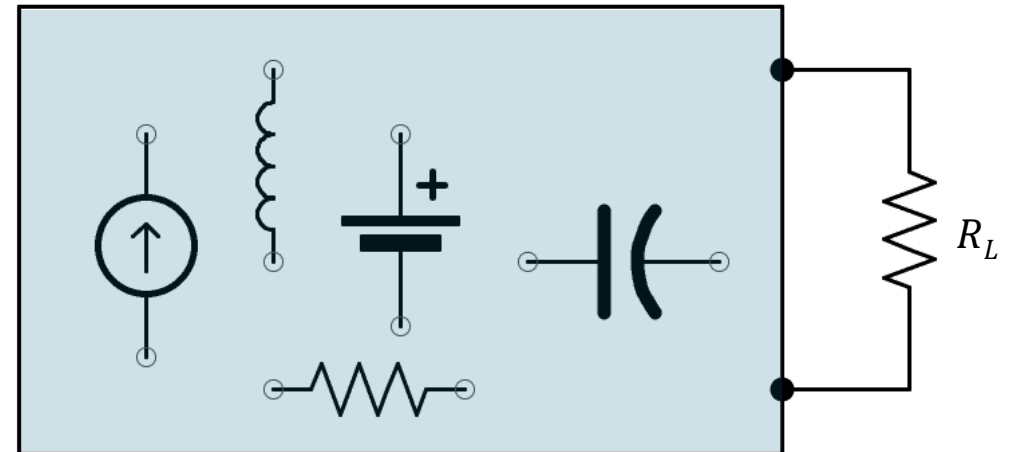
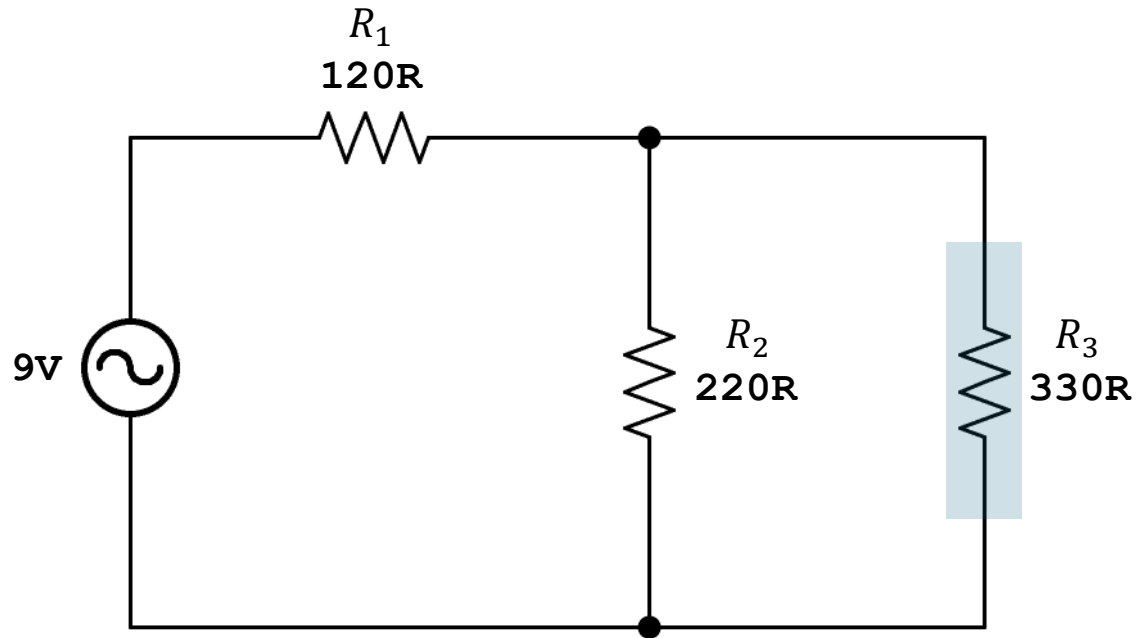# THEVENIN'S THEOREM

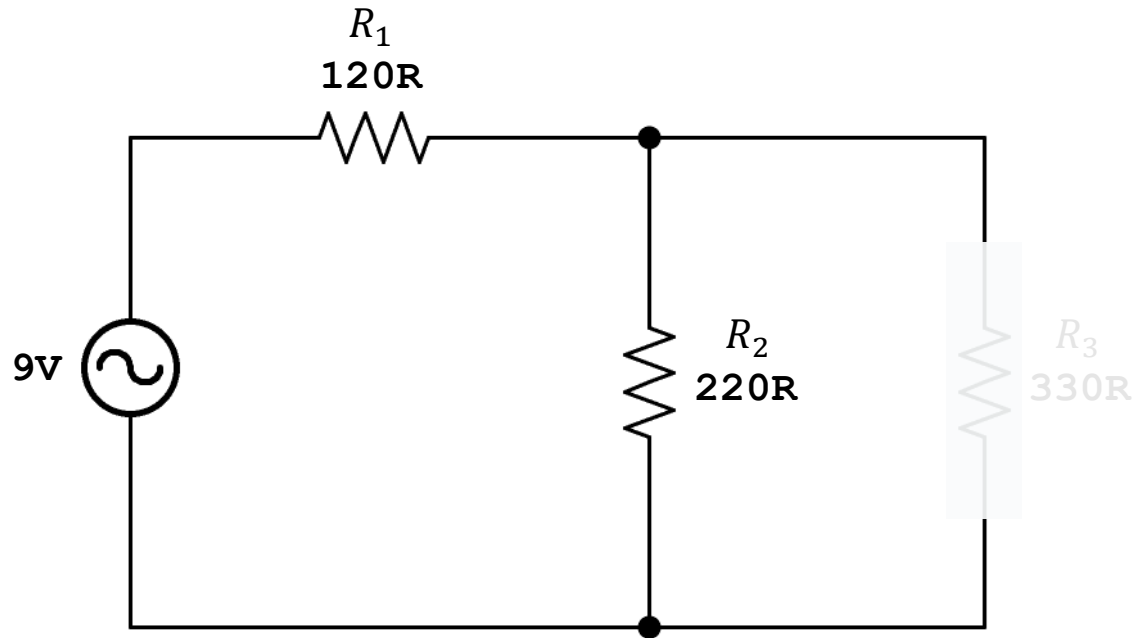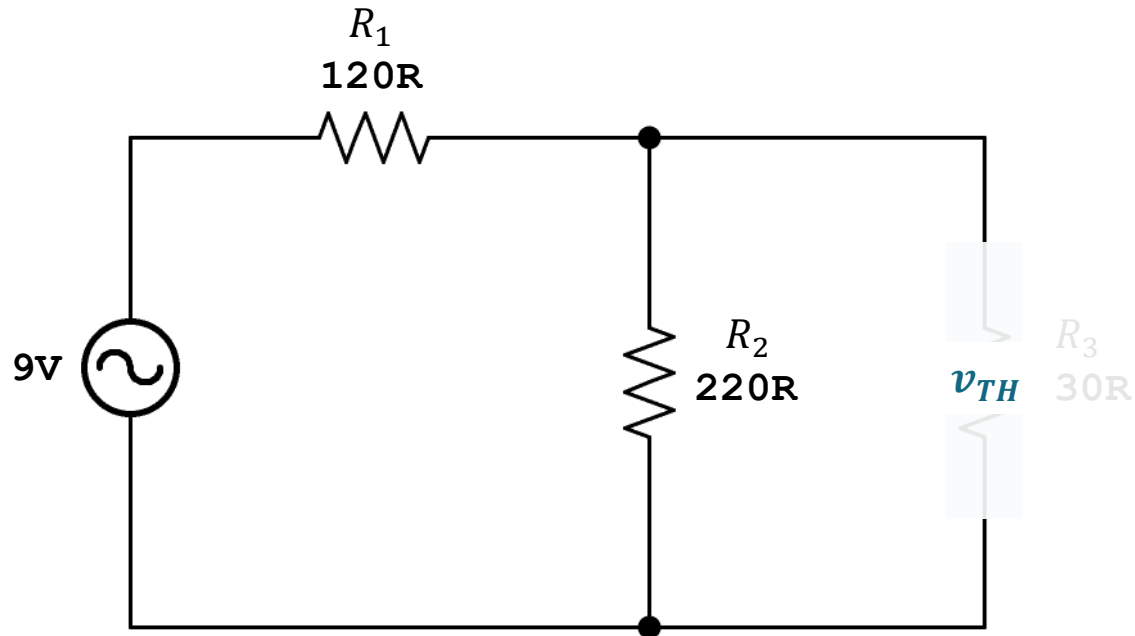Thevenin's Equivalent Circuit

Arbitrary Network

STEPS TO APPLY THEVENIN'S THEOREM

1. Identify the load.

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2. Remove the load.

STEPS TO APPLY THEVENIN'S THEOREM

R_1
120R

R_2
220R

v_{TH}

R_3
30R

9V

1. Identify the load.

2. Remove the load.

3. Determine the Thevenin voltage (v_{th}): Calculate the **open-circuit voltage** across the terminals where the load was connected.
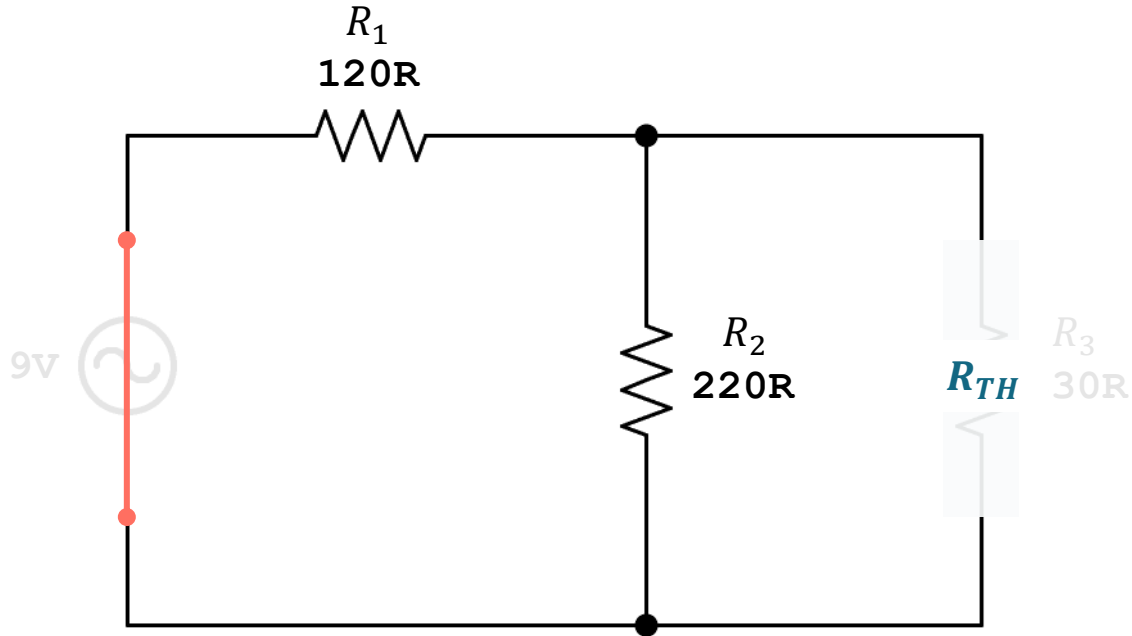
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4. Determine the Thevenin Resistance (R_{TH}): Set all independent **sources to zero** and calculate the equivalent resistance looking into the terminals where the load was connected.

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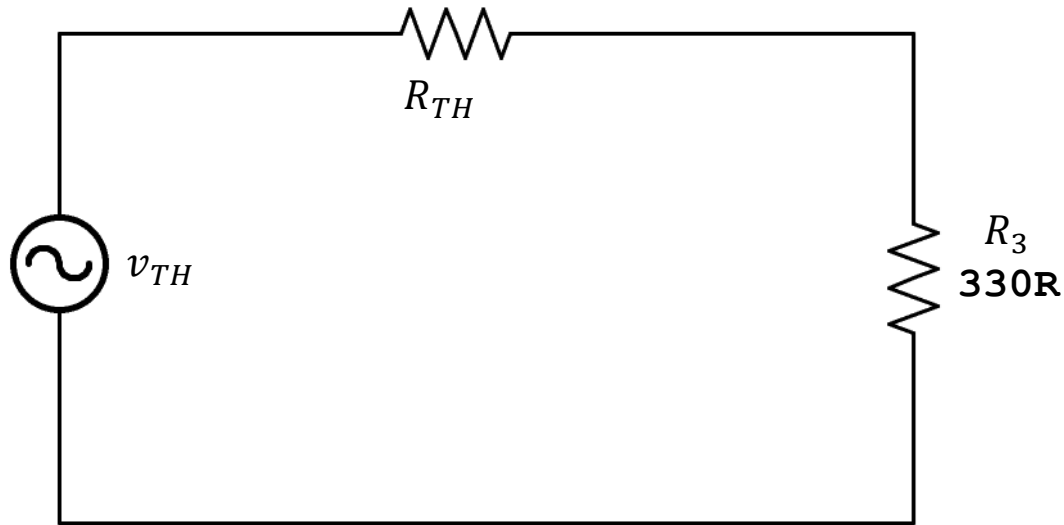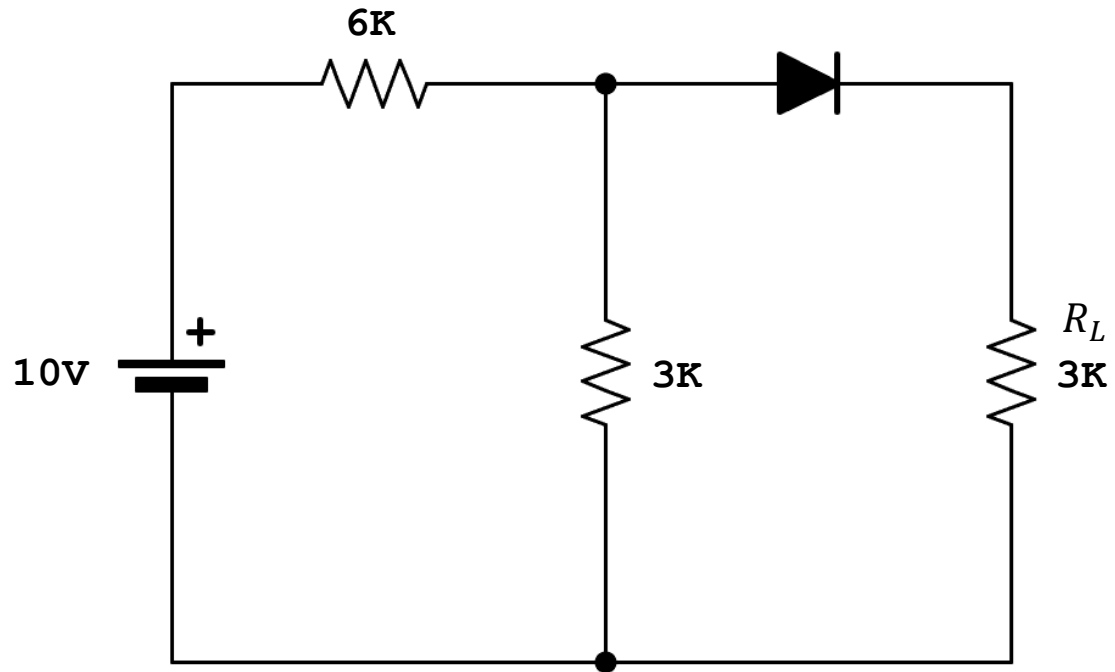
Thevenin Equivalent Circuit

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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 **Thevenin equivalent** and reconnect the load.

EXERCISE

Use the 2nd approximation diode to calculate the load voltage and load current of the given network.

Solution

LABORATORY