

# VOLTAGE AND CURRENT DIVIDER THEOREM

## CIRCUIT ANALYSIS METHOD

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## **TOPIC OUTLINE**

**Voltage Divider Theorem (VDT)**

**Current Divider Theorem (IDT)**



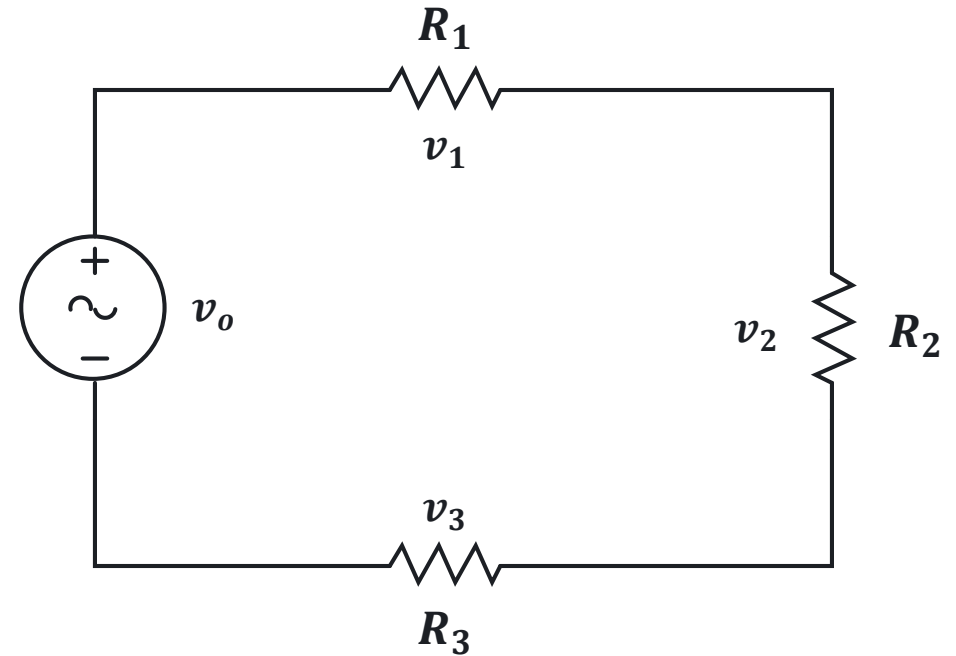
# VOLTAGE DIVIDER THEOREM



# VOLTAGE DIVIDER THEOREM

A voltage divider consists of two or more resistors connected in series with a voltage source. The voltage across each resistor is a fraction of the total applied voltage, determined by the ratio of that resistor's value to the total resistance in the series.

Series Network:



# VOLTAGE DIVIDER THEOREM

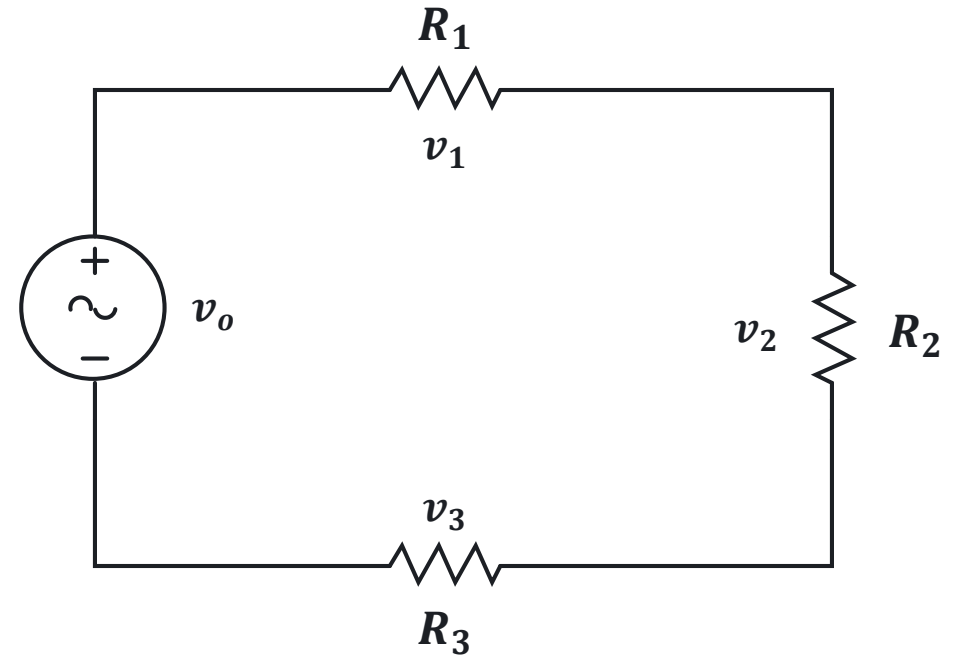
$$v_1 = v_o \frac{R_1}{R_o}$$

$$v_2 = v_o \frac{R_2}{R_o}$$

$$v_3 = v_o \frac{R_3}{R_o}$$

$$v_n = v_o \frac{R_n}{R_o}$$

Series Network:

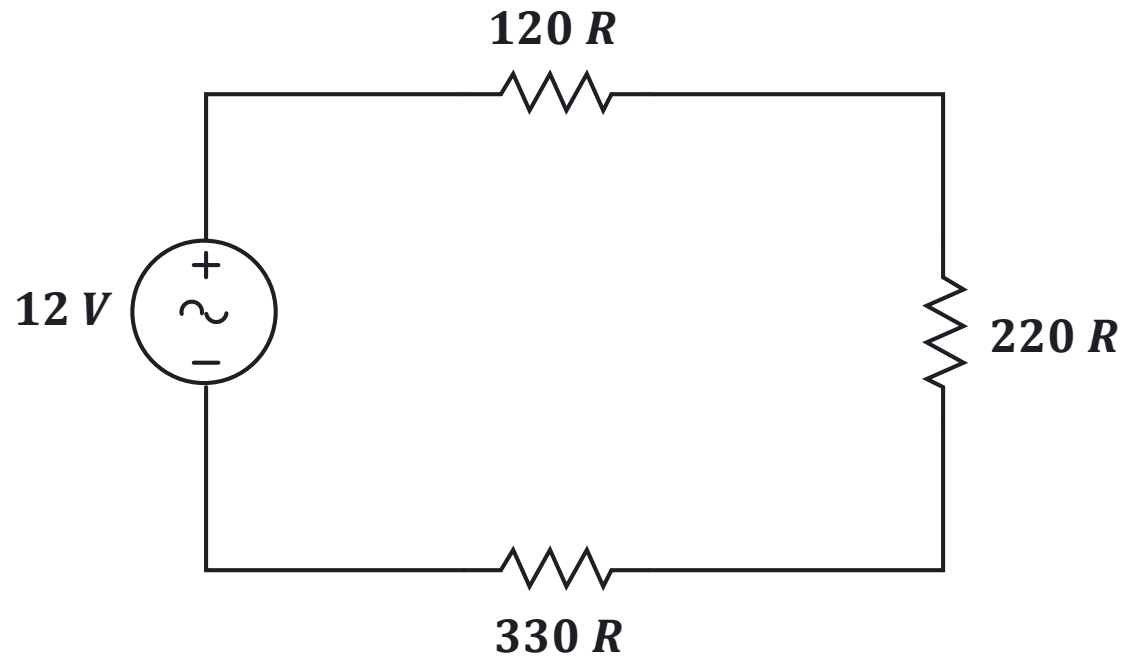


## EXERCISE

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Determine the voltage drop across each resistor of the given circuit.

Solution:



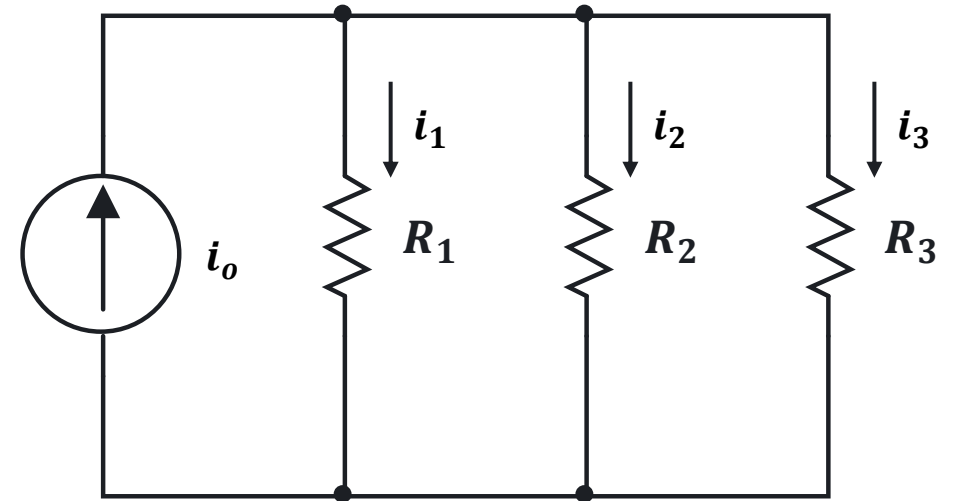
# CURRENT DIVIDER THEOREM



# CURRENT DIVIDER THEOREM

A current divider consists of two or more resistors connected in parallel with a current source. The current through each resistor is a fraction of the total current, determined by the ratio of the other resistor's value to the total resistance in the parallel combination.

Parallel Network:





# CURRENT DIVIDER THEOREM

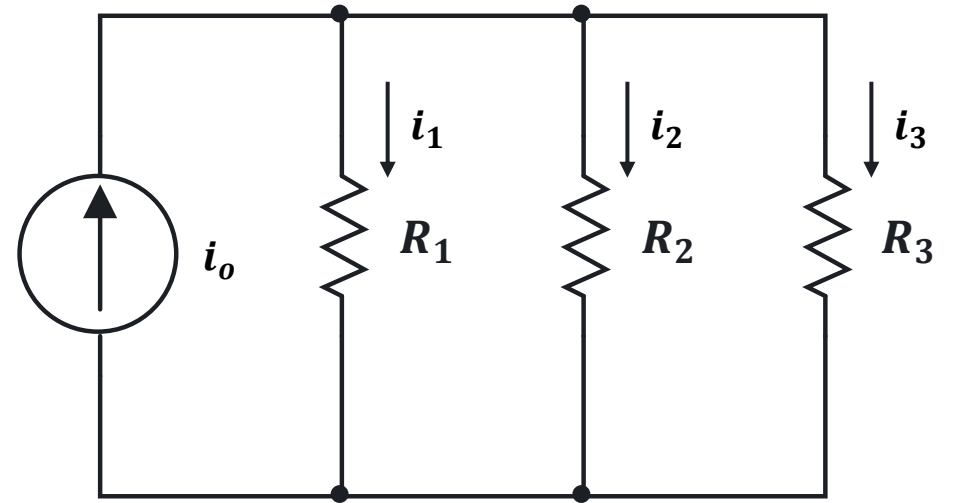
Parallel Network:

$$i_1 = i_o \frac{R_o}{R_1}$$

$$i_2 = i_o \frac{R_o}{R_2}$$

$$i_3 = i_o \frac{R_o}{R_3}$$

$$i_n = i_o \frac{R_o}{R_n}$$

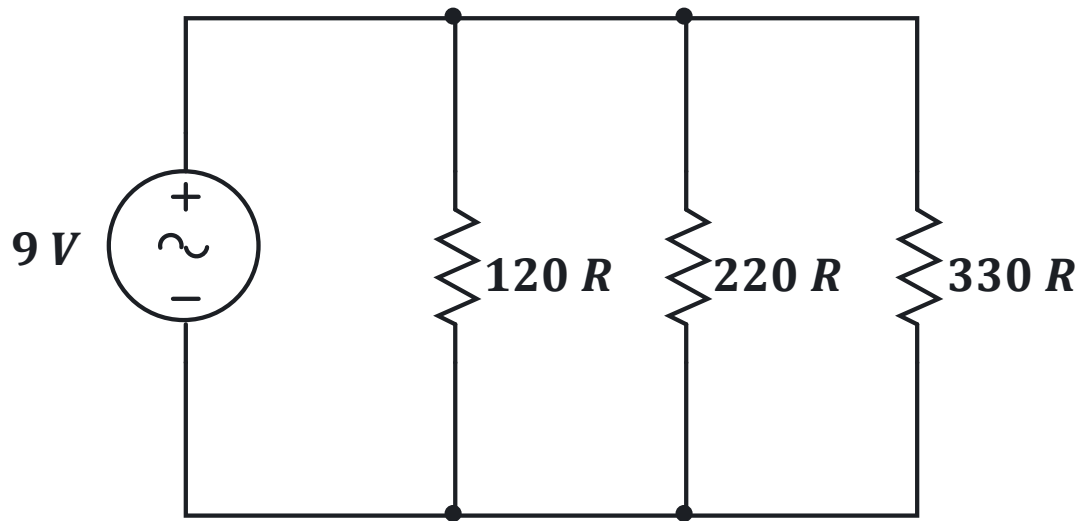


## EXERCISE

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Determine the current flowing through each resistor of the given circuit.

Solution:

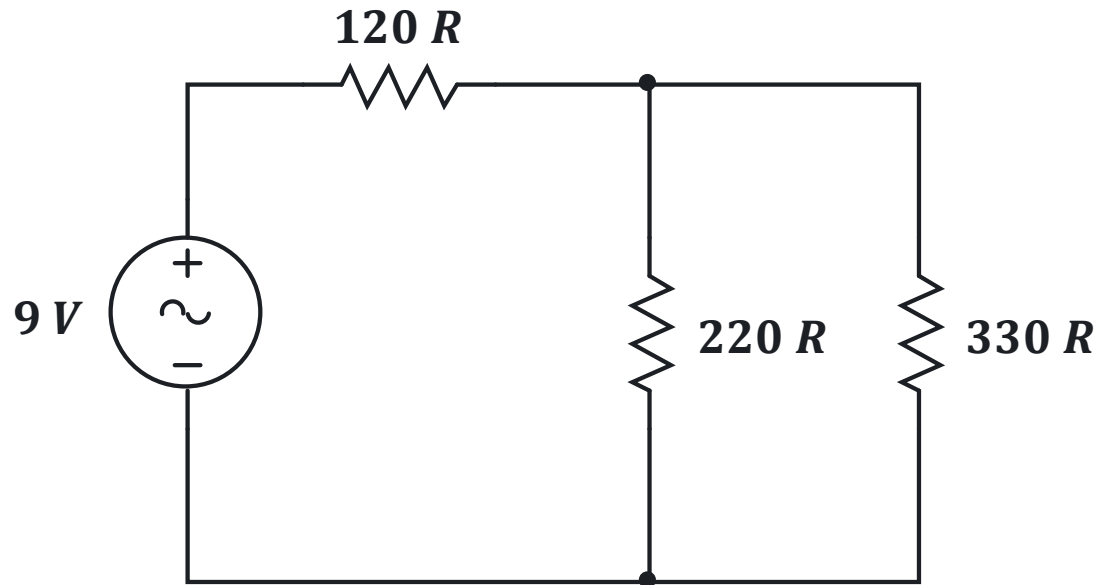


## EXERCISE

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Determine the current flowing through each resistor and the voltage drop across each resistor of the given circuit.

Solution:



# LABORATORY

