VOLTAGE AND CURRENT DIVIDER THEOREM

CIRCUIT ANALYSIS METHOD

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TOPIC OUTLINE

Voltage Divider Theorem (VDT)

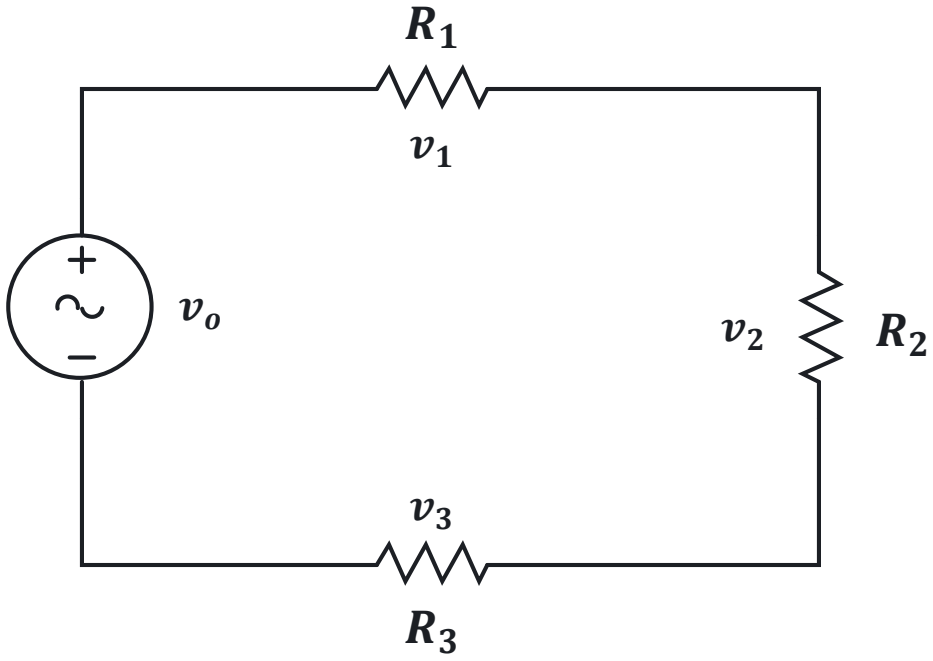
Current Divider Theorem (IDT)

VOLTAGE DIVIDER THEOREM

VOLTAGE DIVIDER THEOREM

A **voltage divider** is 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

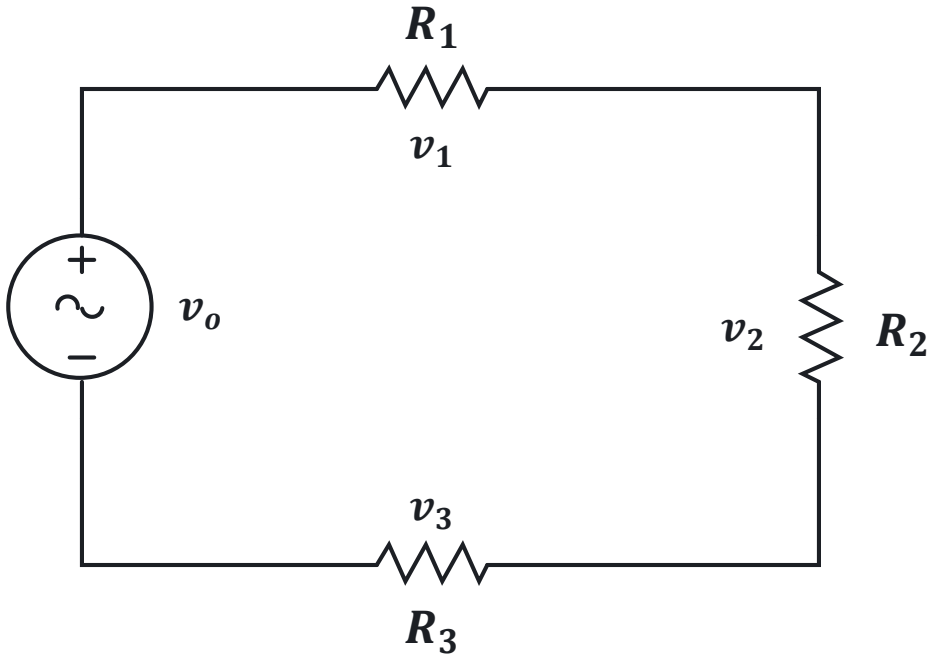
$$v_1 = v_o \frac{R_1}{R_o}$$

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

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

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

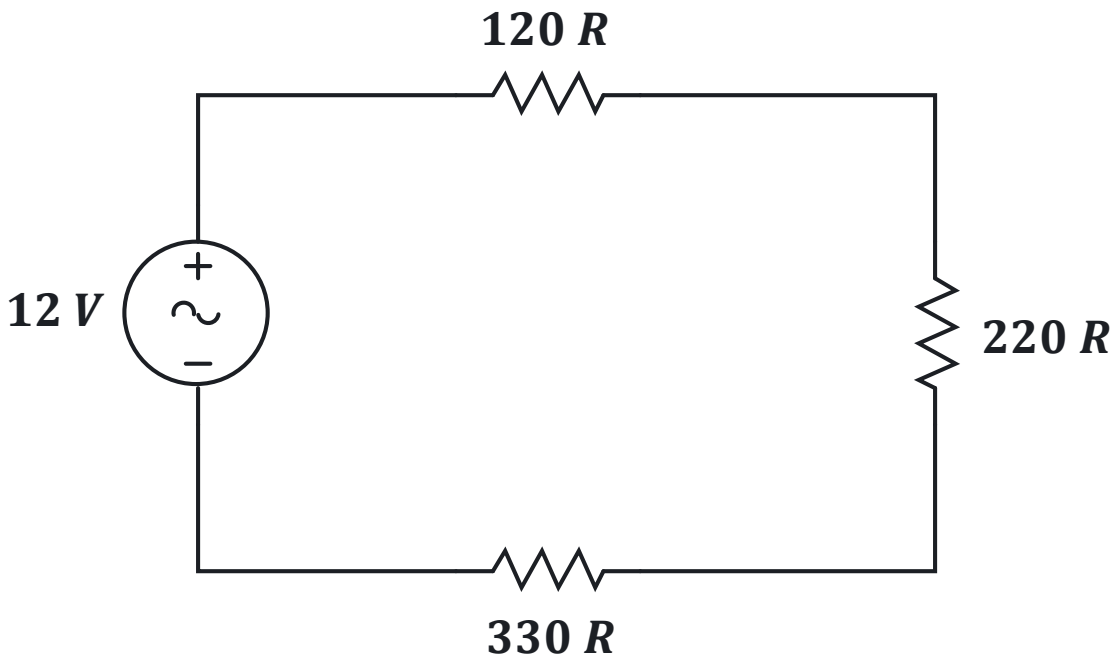
Series Network:



EXERCISE

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

Solution:

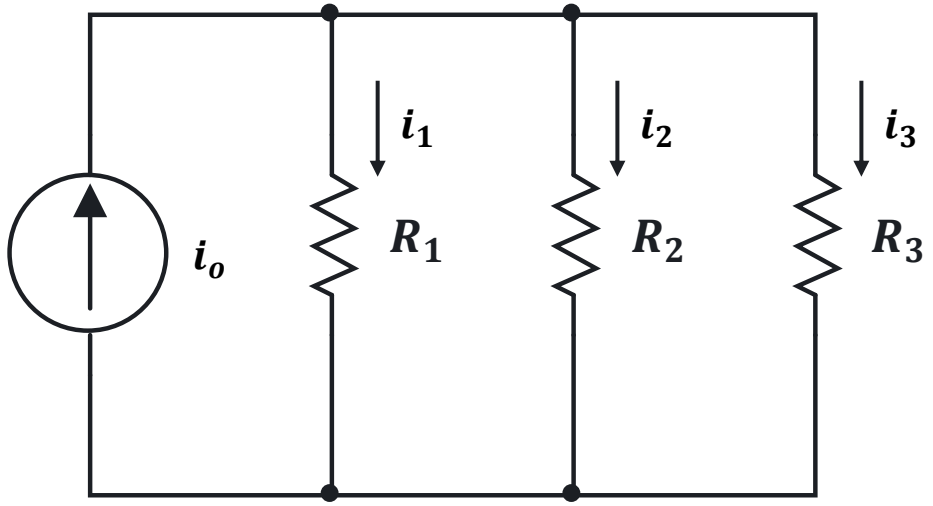


CURRENT DIVIDER THEOREM

CURRENT DIVIDER THEOREM

A **current divider** is 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

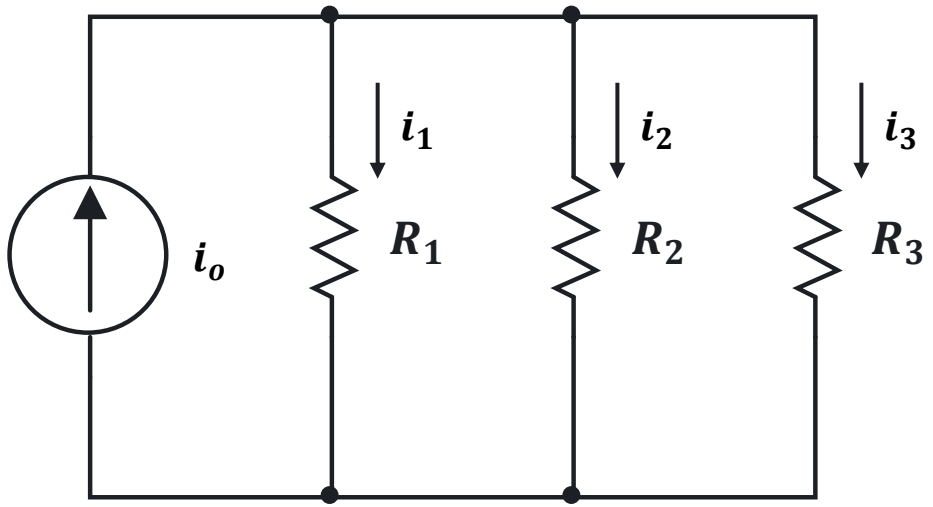
Parallel Network:

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

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

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

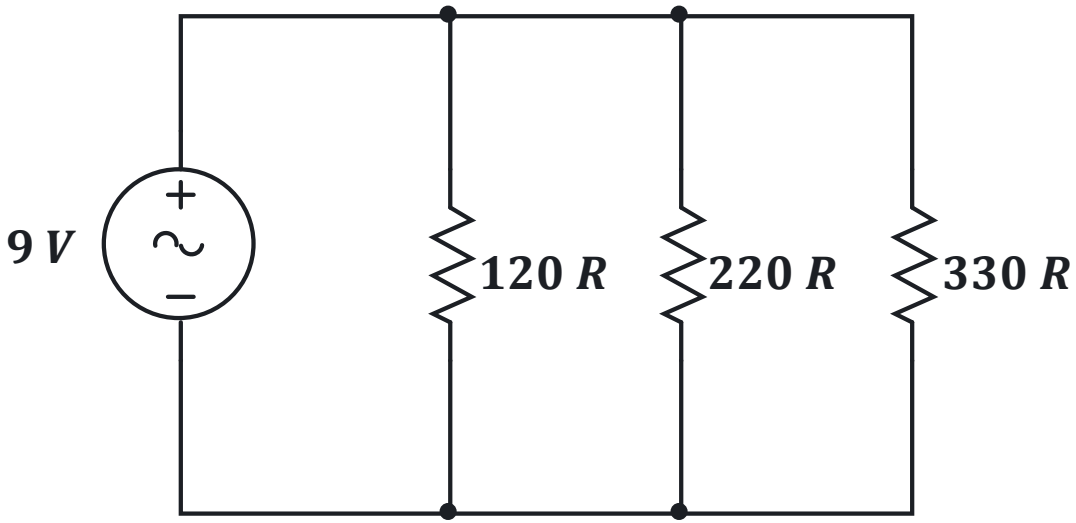
$$i_n = i_o \frac{R_o}{R_n}$$



EXERCISE

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

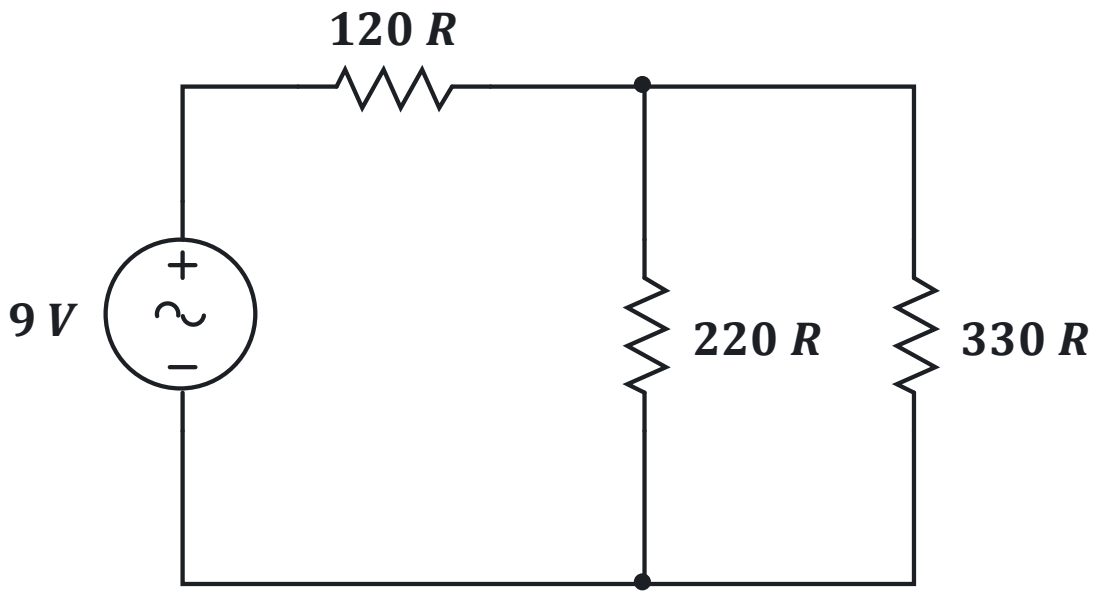
Solution:



EXERCISE

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

Solution:



LABORATORY