

Resistance Calculations

Use the GRASS format to solve the following problems:

1. A heating coil on an electric stove uses 25A of current from a 240V circuit. Calculate the coil's resistance if the temperature is constant.
2. A 200Ω resistor is connected to a power supply set at 8V. Calculate the current going through the resistor.
3. An electric hair dryer has 60.0Ω resistor that has 2.0A of current going through it when the dryer is on. Calculate the potential difference across the resistor.

PRACTICE

4. A toaster oven has a 24.0Ω resistor that has 5.00A of current going through it when the toaster is on. Calculate the potential difference across the resistor.
5. How much current flows through an electric can opener that needs 120V and has a resistance of 110Ω ?

1. G \rightarrow $I = 25A$
 $V = 240V$

R \rightarrow $R = ?$

A \rightarrow $R = \frac{V}{I}$

S \rightarrow $R = \frac{240}{25}$

$R = 9.6\Omega$

2. G \rightarrow $R = 200\Omega$
 $V = 8V$

R \rightarrow $I = ?$

A \rightarrow $I = \frac{V}{R}$

S \rightarrow $I = \frac{8}{200}$

$I = 0.04A$

3. G \rightarrow $R = 60.0\Omega$
 $I = 2.0A$

R \rightarrow $V = ?$

A \rightarrow $V = I \cdot R$

S \rightarrow $V = (2.0)(60.0)$

$V = 120V$

4. G \rightarrow $R = 24.0\Omega$
 $I = 5.00A$

R \rightarrow $V = ?$

A \rightarrow $V = I \cdot R$

S \rightarrow $V = (5.00)(24.0)$

$V = 120V$

5. G \rightarrow $V = 120V$
 $R = 110\Omega$

R \rightarrow $I = ?$

A \rightarrow $I = \frac{V}{R}$

S \rightarrow $I = \frac{120}{110}$

$I = 1.09A$