Ohm's Law

- The relationship between **voltage, current and resistance** is given by Ohm's Law:

$$\mathbf{V = IR}$$

Voltage (V) = **Current** (I) x **Resistance** (R)

Volts (V) amps (A) ohms (Ω)

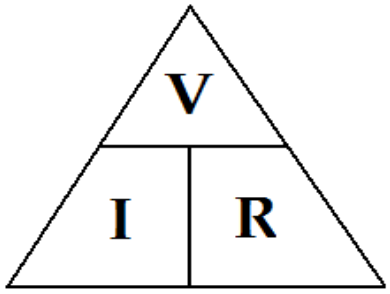
- The greater the resistance, the lower the current.
- The lower the resistance, the higher the current.

Ohm's Law

You can rearrange the formula to calculate resistance and current:

$$resistance = voltage \div current \quad \text{or} \quad R = \frac{V}{I}$$

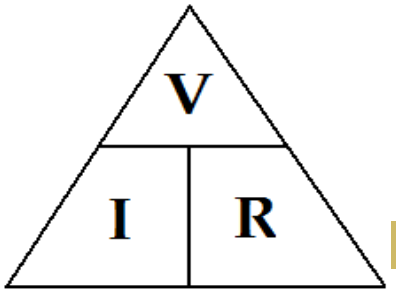
$$current = voltage \div resistance \quad \text{or} \quad I = \frac{V}{R}$$



Fill in the following table and calculate Resistance.

Voltage (V)	Current (A)	Resistance (Ω)
3.0	1.2	2.4 Ω
4.5	1.7	2.65 Ω
6.0	2.5	2.4 Ω
9.0	3.6	2.5 Ω
12.0	5.0	2.4 Ω

Example #1



A current of 2.5 mA flows through a resistor when connected to a 16 V power supply.

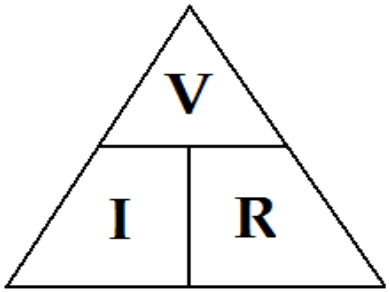
What is the value of this resistor?

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

$$= \frac{16\ V}{0.0025\ A}$$

$$= \boxed{6400\ \Omega}$$

Example #2



What is the current produced by a potential difference of 240 volts through a resistance of 0.2 ohms?

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

$$= \frac{240\ V}{0.2\ \Omega}$$

$$= \boxed{1200A}$$