

# Year 11 Physics

Electrical Formula

# Joules to watts calculation

- The power  $P$  in watts (W) is equal to the energy  $E$  in joules (J), divided by the time period  $t$  in seconds (s):

$$P_{(W)} = E_{(J)} / t_{(s)}$$

- Joules to volts calculation

- The voltage  $V$  in volts (V) is equal to the energy  $E$  in joules (J), divided by the charge  $Q$  in coulombs (C):

$$V_{(V)} = E_{(J)} / Q_{(C)}$$

- Volts to joules calculation

- The energy  $E$  in joules (J) is equal to the voltage  $V$  in volts (V), times the electrical charge  $Q$  in coulombs (C):

$$E_{(J)} = V_{(V)} \times Q_{(C)}$$

# Ohms calculations

- The resistance  $R$  in ohms ( $\Omega$ ) is equal to the voltage  $V$  in volts (V) divided by the current  $I$  in amps (A):

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

- The resistance  $R$  in ohms ( $\Omega$ ) is equal to the squared voltage  $V$  in volts (V) divided by the power  $P$  in watts (W):

$$R = \frac{V^2}{P}$$

- The resistance  $R$  in ohms ( $\Omega$ ) is equal to the power  $P$  in watts (W) divided by the squared current  $I$  in amps (A):

$$R = \frac{P}{I^2}$$

# Amps calculations

- The current  $I$  in amps (A) is equal to the voltage  $V$  in volts (V) divided by the resistance  $R$  in ohms ( $\Omega$ ):

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

- The current  $I$  in amps (A) is equal to the power  $P$  in watts (W) divided by the voltage  $V$  in volts (V):

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

- The current  $I$  in amps (A) is equal to the square root of the power  $P$  in watts (W) divided by the resistance  $R$  in ohms ( $\Omega$ ):

$$I = \sqrt{\frac{P}{R}}$$

# Volts calculations

- The voltage  $V$  in volts (V) is equal to the current  $I$  in amps (A) times the resistance  $R$  in ohms ( $\Omega$ ):

$$V = I \times R$$

- The voltage  $V$  in volts (V) is equal to the power  $P$  in watts (W) divided by the current  $I$  in amps (A):

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

- The voltage  $V$  in volts (V) is equal to the square root of the power  $P$  in watts (W) times the resistance  $R$  in ohms ( $\Omega$ ):

$$V = \sqrt{P \times R}$$

# Watts calculation

- The power  $P$  in watts (W) is equal to the voltage  $V$  in volts (V) times the current  $I$  in amps (A):

$$P = V \times I$$

- The power  $P$  in watts (W) is equal to the squared voltage  $V$  in volts (V) divided by the resistance  $R$  in ohms ( $\Omega$ ):

$$P = \frac{V^2}{R}$$

- The power  $P$  in watts (W) is equal to the squared current  $I$  in amps (A) times the resistance  $R$  in ohms ( $\Omega$ ):

$$P = I^2 \times R$$