

Ohm's Law: The potential difference (V) across a component is directly proportional to the current (I) through it, provided its temperature remains constant.

Core Equation: $V = I \times R$

Rearranged Forms: $I = \frac{V}{R}$ | $R = \frac{V}{I}$

Units: V (Potential difference, Volts) | I (Current, Amperes) | R (Resistance, Ohms, Ω)

Section A: Recall, Rearranging & Unit Conversions

1. Complete the table below with the correct SI unit and symbol for each variable in Ohm's Law:

Variable	Unit Name	Unit Symbol
Potential difference (V)	_____	_____
Current (I)	_____	_____
Resistance (R)	_____	_____

2. Rearrange the formula $V = I \times R$ to make I and R the subject:

a) $I =$ _____

b) $R =$ _____

3. Convert the following values into their standard SI units:

a) 250 mA = _____ A

b) 4.7 k Ω = _____ Ω

c) 120 mV = _____ V

d) 0.005 A = _____ mA

Section B: Practice Calculations

4. Calculate the missing values in the following scenarios. Show your working clearly and state the correct units.

a) A current of 0.5 A flows through a resistor with a resistance of 12 Ω . Calculate the potential difference across the resistor.

b) A 9 V battery is connected across a component with a resistance of 30 Ω . Calculate the current flowing through the component.

c) A 12 V power supply drives a current of 200 mA through a circuit. Calculate the total resistance of the circuit.

- d) A component has a resistance of $1.5 \text{ k}\Omega$. If a current of 0.04 A flows through it, what is the potential difference across the component?

Section C: Challenge Context

5. Figure 1 shows a simple circuit containing a 6 V cell, a fixed resistor, and an ammeter. The ammeter reads 150 mA .

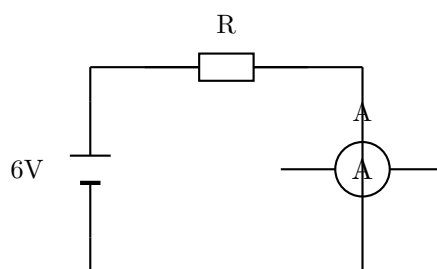


Figure 1: Simple Series Circuit

- a) Calculate the resistance of the fixed resistor, R . Give your answer to an appropriate number of significant figures.

- b) Explain what would happen to the current flowing through the circuit if the potential difference of the cell was halved AND the resistance of the fixed resistor was doubled.
