

IB Physics SL Y2:
Thursday, September 11, 2014

Do Now:

- 1) Take-out paper, pencil, calculator, and HW.
- 2) Using equation to the right, answer the following questions
 - a) What does each variable represent (include units)?
 - b) What is the relationship between...
 - (i) R and ρ
 - (ii) R and L
 - (iii) R and A
 - (iv) V and ρ
 - (v) I and ρ

IB Physics SL Y2: 9-9-14 HW Review

Ch. 5 - Electric Current - Exercises #1-4, 7, 10-12

1 If a p.d. of 9V causes a current of 3 mA to flow through a wire, what is the resistance of the wire?

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

$$\frac{9V}{3 \times 10^{-3}} = 3 \times 10^3 \text{ or } 3000 \text{ ohms}$$

$$3000 \Omega$$

$$3 \text{ k}\Omega$$

$$0.001 \text{ A} = 1 \text{ mA}$$

2 A current of $1\ \mu\text{A}$ flows through a $300\ \text{k}\Omega$ resistor. What is the p.d. across the resistor?

$$\begin{aligned} I &= 1\ \mu\text{A} = 1 \times 10^{-6}\ \text{A} & R &= 300\ \text{k}\Omega \\ & & &= 300 \times 10^3\ \Omega \\ & & &= 3.0 \times 10^5\ \Omega \\ V &= IR \\ V &= (1 \times 10^{-6}\ \text{A})(3 \times 10^5\ \Omega) \\ V &= 3\ \text{V} \end{aligned}$$

3 If the p.d. across a $600\ \Omega$ resistor is 12V , how much current flows?

$$\begin{aligned} V &= IR \\ V &= 12\text{V} \\ R &= 600\ \Omega \\ I &? \end{aligned} \quad I = \frac{V}{R} \quad I = \frac{12}{600} = 0.02\text{A}$$

4 Below is a table of the p.d. and current through a device called a thermistor.

p.d./V	Current/A
1.0	0.01
10	0.1
25	1.0

Calculate the resistance at different potential differences.

$$R = \frac{V}{I} \quad R_1 = \frac{1.0V}{0.01} = 100\Omega$$

$$R_2 = \frac{10}{0.1} = 100\Omega$$

$$R_3 = \frac{25}{1.0} = 25\Omega$$