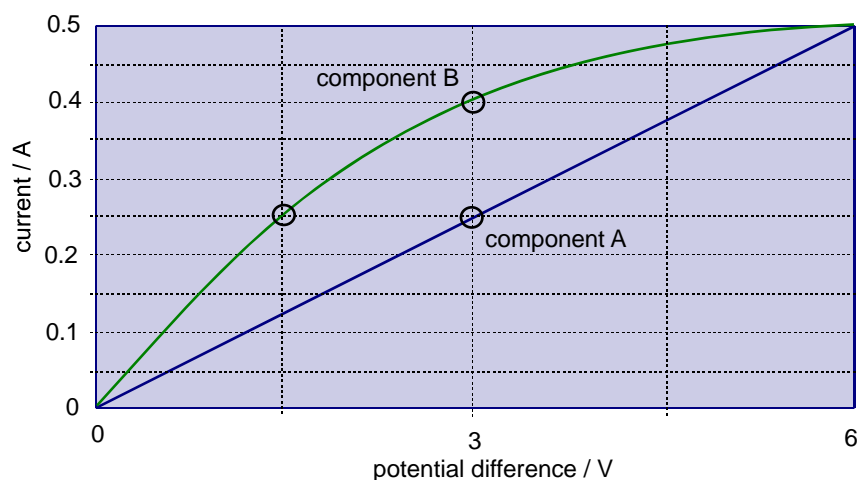


## TAP 109- 3: Lamp and resistor in series

Study the characteristics of the two electrical components A and B shown.



1. What is the resistance of each component with a potential difference of 3 V across it?
2. Suggest what each component could be.

The two components are connected in series across a variable d.c. supply. A high resistance digital voltmeter measures the pd across A.

3. What is the current through A when the voltmeter reads 3 V?
4. What is the potential difference being provided by the supply?
5. If the supply potential difference is increased so that the voltmeter reads 6 V, what is the power being dissipated in each component?

### Hints

1. Read the currents flowing with a potential difference of 3 V
3. Read the current from the graph.
4. Read the pd across B at a current equal to that through A; add the pd to that across A.
5. Find the current in A from the graph; find the pd across B for this current from the graph; use  $P = I V$

### Answers and worked solutions

1.  $A = 12 \Omega$ ;  $B = 7.5 \Omega$
2. A is an ohmic resistor, perhaps a metal wire. The resistance of B increases with current. It could be a filament lamp.
3. 0.25 A
4. 4.5 V
5. 3 W

**External references**

**This activity is taken from Advancing Physics, Chapter 2, 190D**