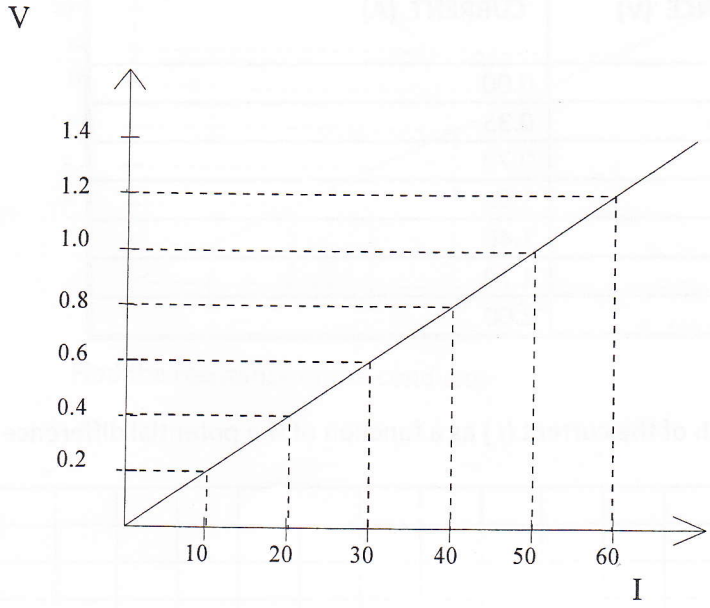
Answer Key

Graphing Resistance

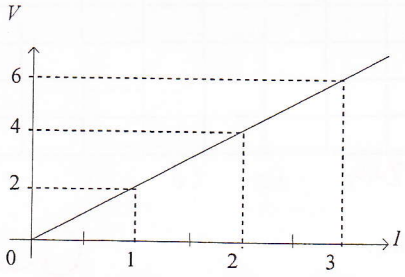
1. The following graph shows the intensity of the current through a conductor versus the potential difference applied to it.



$\frac{1.2 - 0}{60 - 0} = 0.02\,\Omega$

Find the resistance of the conductor.

2. The electric current passing through a resistor has been measured for different voltages. The following graph shows the results.



What is the value of the resistance of the resistor?

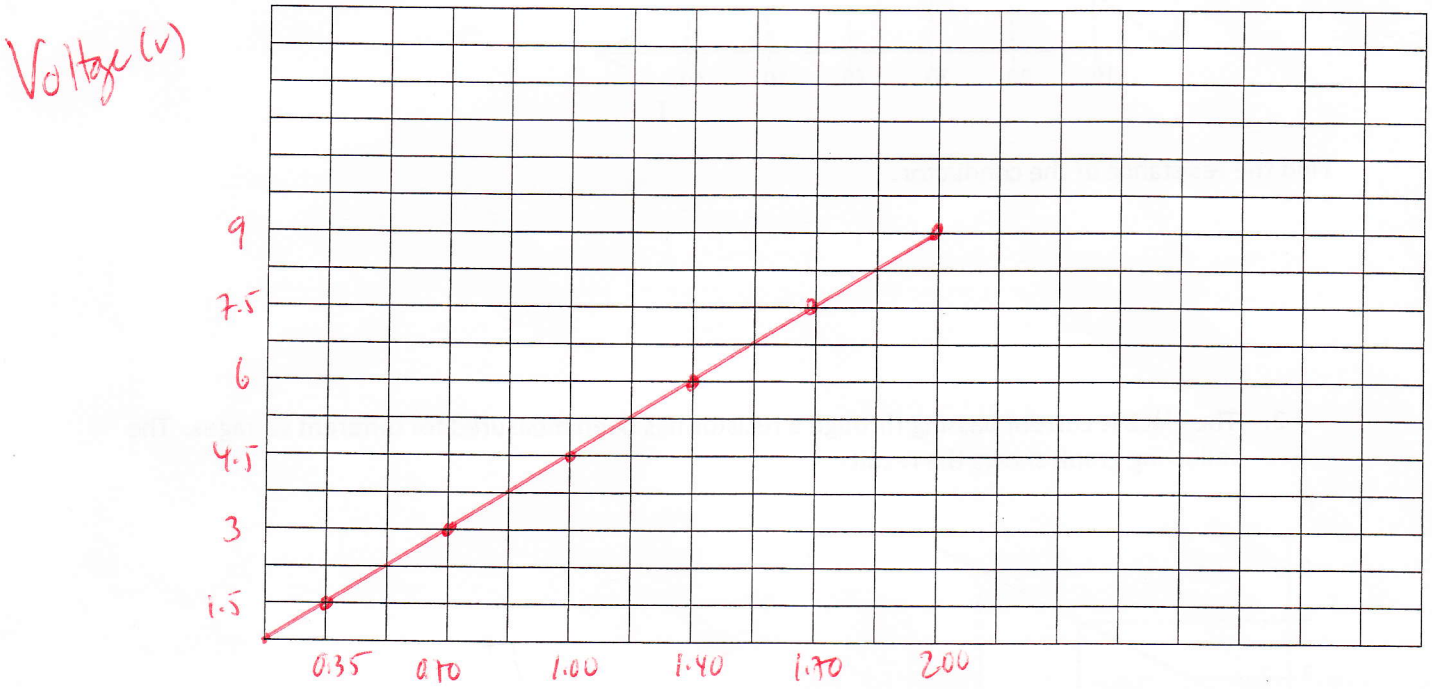
A) 2 Ω
B) 0.5 Ω
C) 10 Ω
D) 90 Ω

3. Varying the potential difference between 0 and 9 volts you measure the current through a nichrome wire, gauge 26 and length 50 cm.

Your results are shown in the table below.

POTENTIAL DIFFERENCE (V)	CURRENT (A)
0.0	0.00
1.5	0.35
3.0	0.70
4.5	1.00
6.0	1.40
7.5	1.70
9.0	2.00

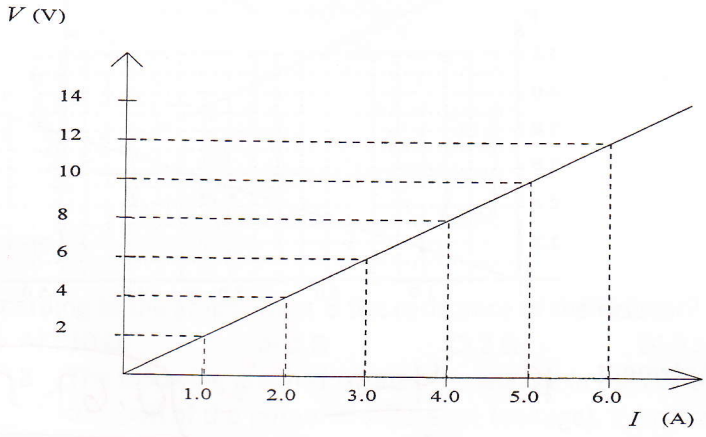
A) Draw a resistance graph of the current (I) as a function of the potential difference (V).



B) From the graph, determine the resistance of the wire.

$$R = \frac{9-0}{2-0} = \boxed{4.5\ \Omega}$$

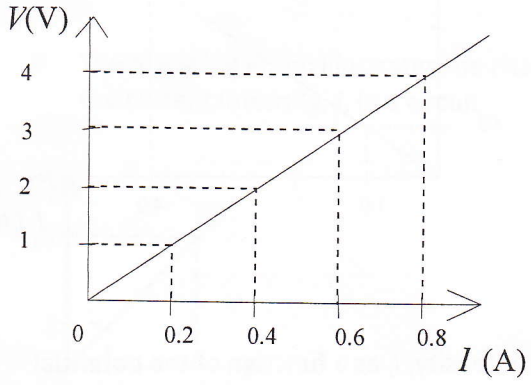
4. The following graph shows the intensity of the current through a conductor versus the potential difference applied to it.



$R = \frac{12-0}{6-0} = 2\,\Omega$

Find the resistance of the conductor.

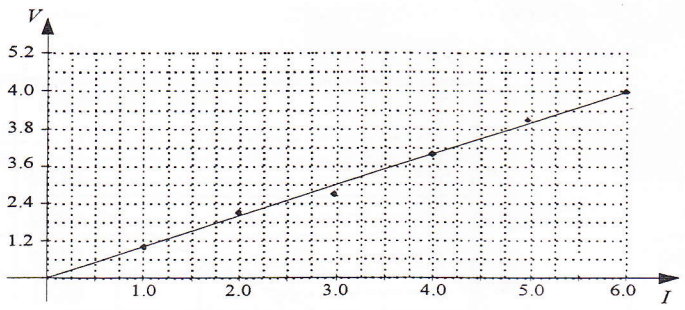
5. The graph below illustrates current intensity *I* as a function of potential difference *V* for a resistor.



$R = \frac{4-0}{0.8-0} = 5\,\Omega$

What is the resistance of the resistor?

6. In the laboratory, a circuit element is subjected to variations in the potential difference. The graph shown at the right indicates the values obtained.



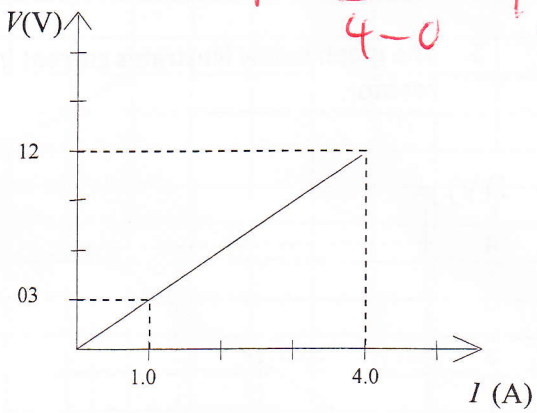
Calculate the resistance of this circuit element.

$R = \frac{4-0}{6-0} = 0.67\ \Omega$

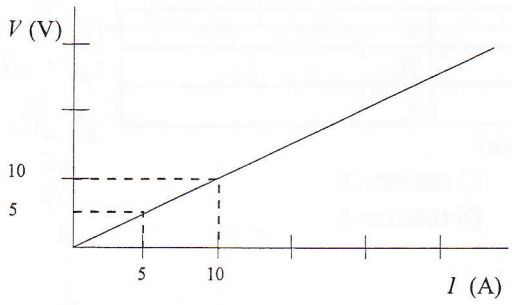
7. You are to connect an ammeter in such a way that you will be able to directly read the current intensity running through resistor R_1.

$R = \frac{12-0}{4-0} = 3\ \Omega$

A resistor is connected in an electric circuit. The graph below illustrates the change in current intensity *I* as a function of the potential difference *V* across the resistor.
According to this graph, what is the value of the resistance of the resistor?



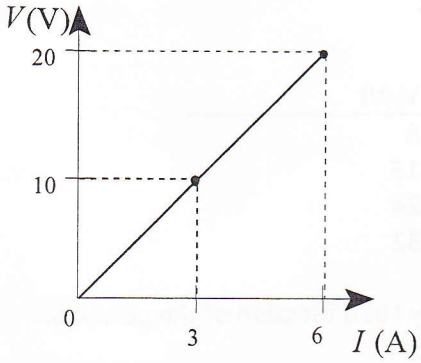
The following graph shows the variation in the current intensity, *I*, as a function of the potential difference (voltage), *V*, across a resistor.



According to the graph, what is the resistance of the resistor?

A) 10 Ω B) 1 Ω C) 2 Ω D) 0.5 Ω

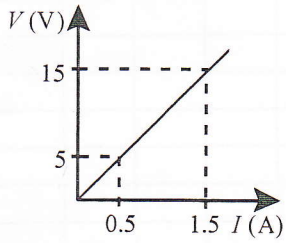
8. The following graph illustrates the change in the current intensity, *I*, in a circuit element as a function of the potential difference (voltage), *V*, across its terminals.



What is the resistance of this circuit element?

A) 2 Ω B) 0.5 Ω C) 3.3 Ω D) 100 Ω

9. The following graph illustrates the change in potential difference (voltage), *V*, as a function of the current intensity, *I*, in a circuit.



What is resistance of this circuit?

A) 0.1 Ω B) 10.0 Ω C) 3.0 Ω D) 15.0 Ω

10. The following table shows measurements related to four different resistors.

Resistor	Potential Difference (V)	Current Intensity (A)
1	10	10

1Ω

2	10	1
3	1	10
4	4	2

10 Ω
0.1 Ω
2 Ω

Which of the above resistors has the greatest resistance?

A) Resistor 1
B) Resistor 2
C) resistor 3
D) resistor 4

11. A student was asked to vary the current intensity in this circuit and to measure the potential difference (voltage) across the terminals of each resistor for each value of I_t.

The student made the following observations:

I_t(A)	V_1(V)	V_2(V)
2	6	8
4	12	16
6	18	24
8	24	32

A) For each resistor, draw a **graph** showing current intensity *I* as a function of the potential difference (voltage) *V* across the terminals of that resistor.
B) **Calculate the slope of each graph** in order to determine the resistance of each resistor.
C) Given this data and using graphs, determine which resistor has the greatest conductance.