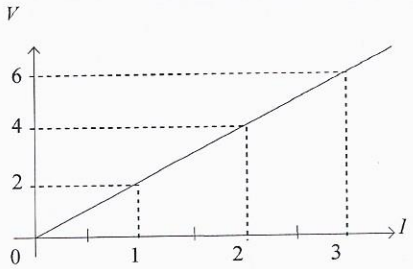
Resistance graphs worksheet

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



6/3 = 2Ω

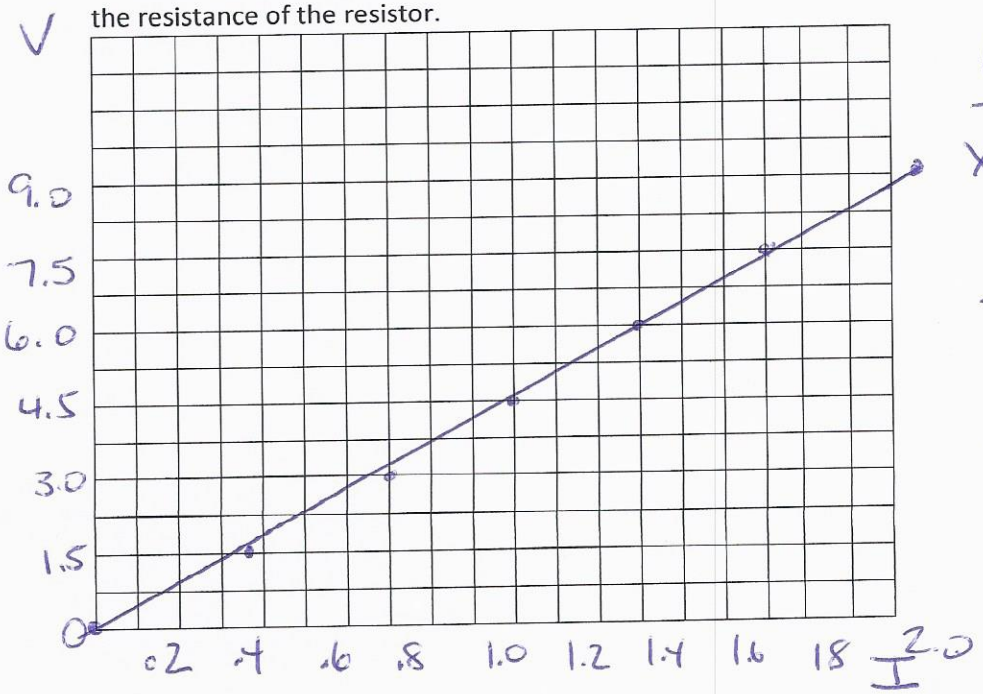
What is the value of the resistance of the resistor?

A) 2 Ω B) 0.5 Ω C) 10 Ω D) 90 Ω

2. 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

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



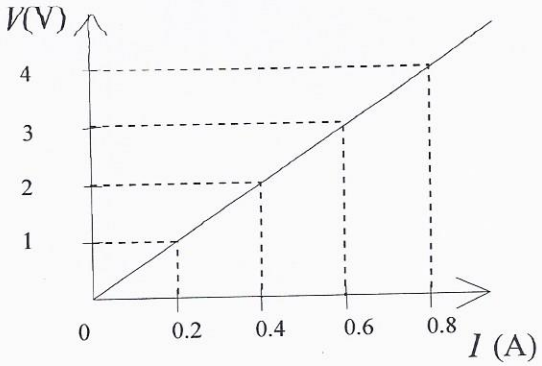
$\frac{y_2 - y_1}{x_2 - x_1}$

$\frac{9.0 - 7.5}{2.00 - 1.7}$

$\frac{1.5}{.3} =$

5Ω

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

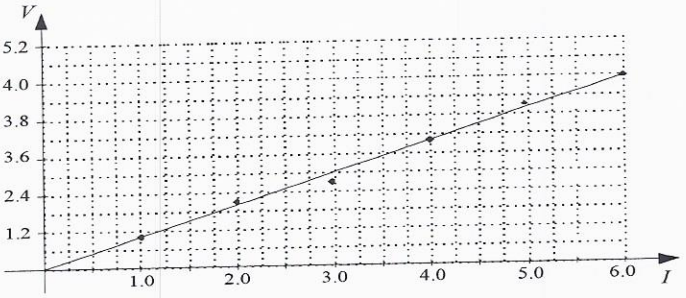


$R = V/I$ $4/.8$

5Ω

What is the value of the resistor?

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

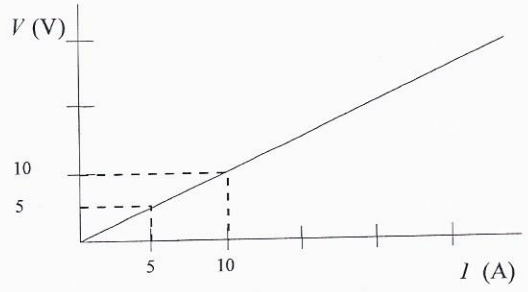


Calculate the resistance of this circuit element.

$\frac{y_2 - y_1}{x_2 - x_1}$ $\frac{4 - 3.85}{6 - 4.9}$ $\frac{.15}{1.1}$

.14Ω

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

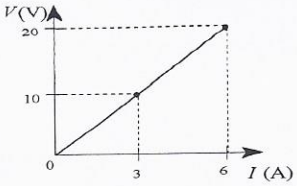


$10/10 = 1\Omega$

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

A) 10 Ω B) 1 Ω C) 2 Ω D) 0.5 Ω

6. 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.



20/6 = 3.3Ω

What is the resistance of this circuit element?

A) 2 Ω B) 0.5 Ω C) 3.3 Ω D) 100 Ω

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

Resistor	Potential Difference (V)	Current Intensity (A)
1	10	10
2	10	1
3	1	10
4	4	2

10/10 = 1Ω
10/1 = 10Ω
1/10 = 0.1Ω
4/2 = 2Ω

Which of the above resistors has the least resistance?

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

8. 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.

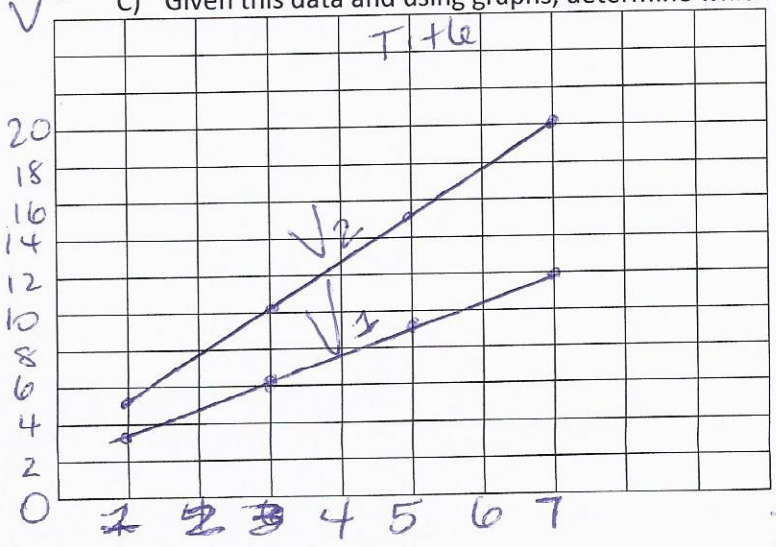
The student made the following observations:

I_t(A)	V_1(V)	V_2(V)
1	3	5
3	6	10
5	9	15
7	12	20

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 least conductance.



B

V_1: $\frac{12-9}{7-5}$ = $\frac{3}{2}$ = 1.5Ω

V_2: $\frac{y_2-y_1}{x_2-x_1}$ = $\frac{20-15}{7-5}$ = $\frac{5}{2}$ = 2.5Ω

C) V_2 least conductor = ↑ resistance.