

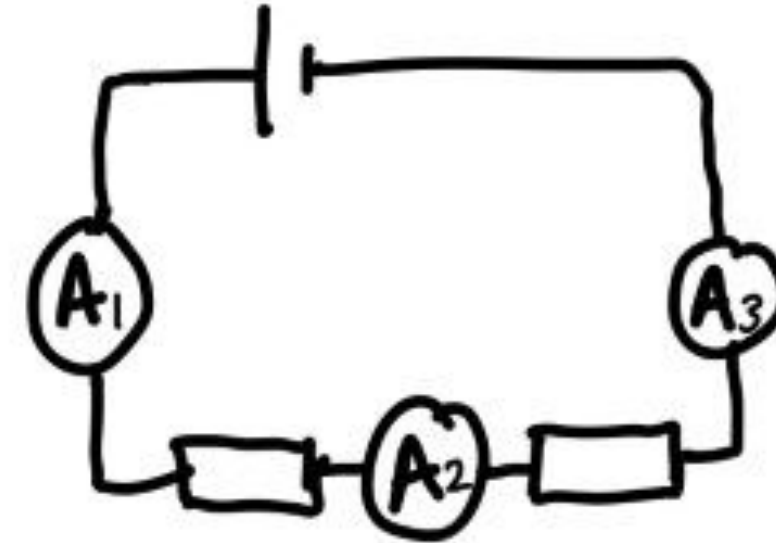
Series Circuits

Miss Walrond



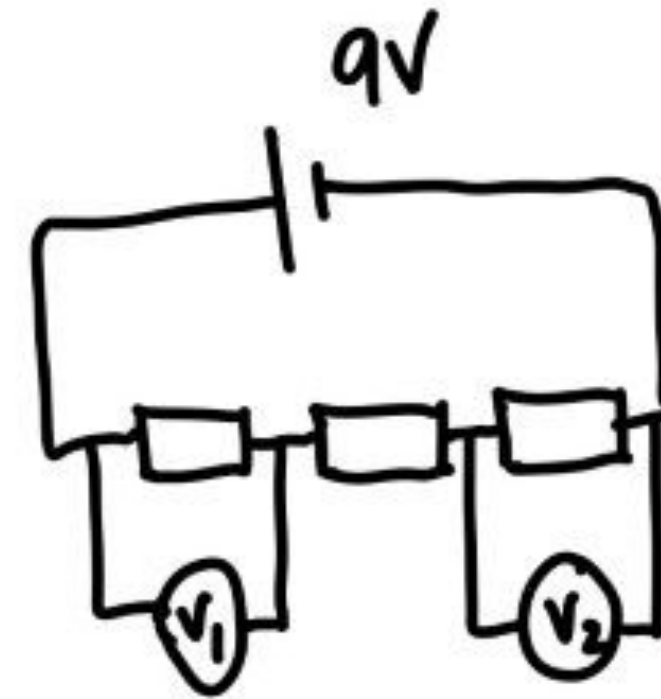
Current in series circuits

- 1) Draw the circuit to the right.
- 2) If the current through ammeter 2 is 1.8 A, predict the current through ammeter 1 and ammeter 3.



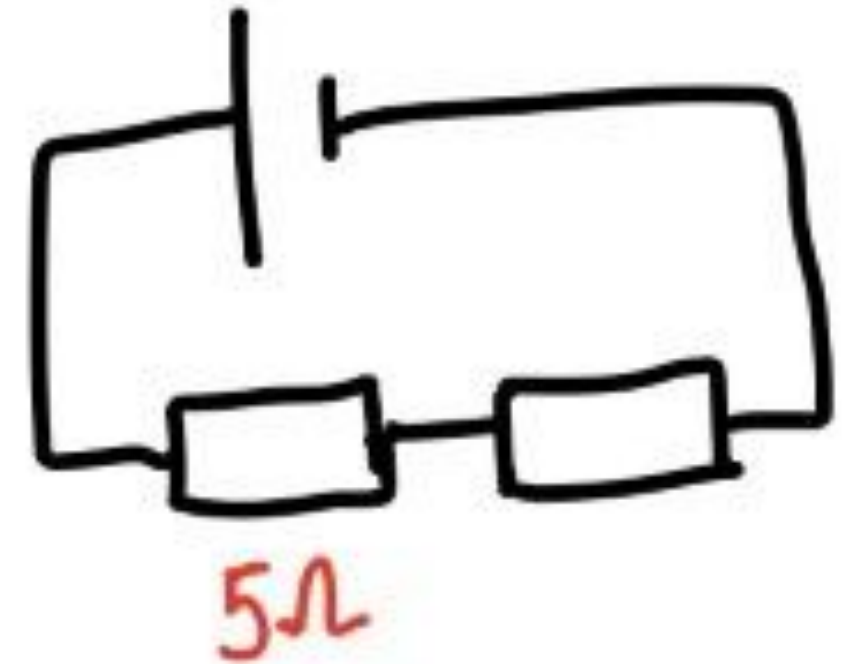
Potential difference in series circuits

- 1) Draw the circuit to the right.
- 2) If the potential difference across voltmeter 1 is 2 V and the potential difference across voltmeter 2 is 4 V, what must be the potential difference across the middle resistor?



Resistance in series circuits

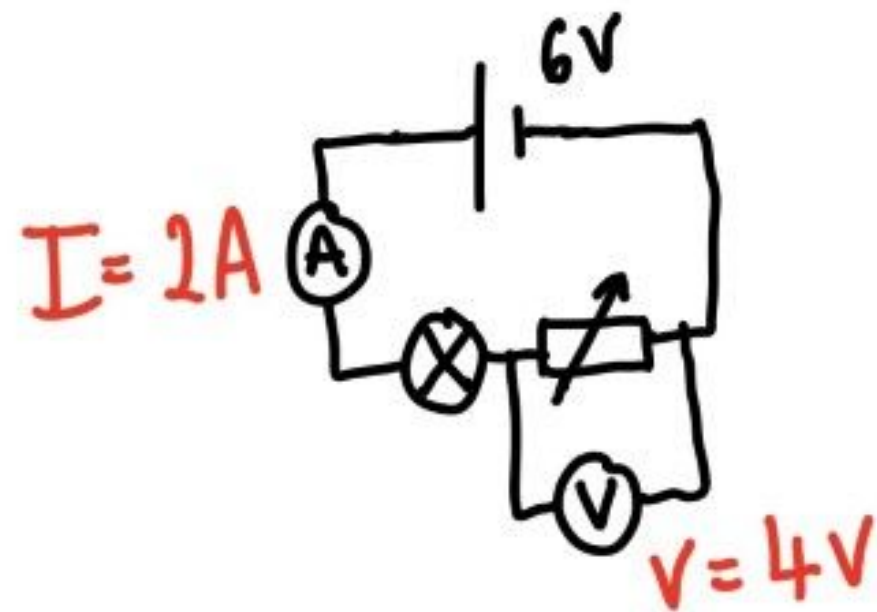
- 1) Draw the circuit to the right.
- 2) If the total resistance is $20\ \Omega$ what is the resistance of the second resistor?
- 3) If the cell voltage is $6\ \text{V}$ and the current is $0.3\ \text{A}$, show that the total resistance is $20\ \Omega$.



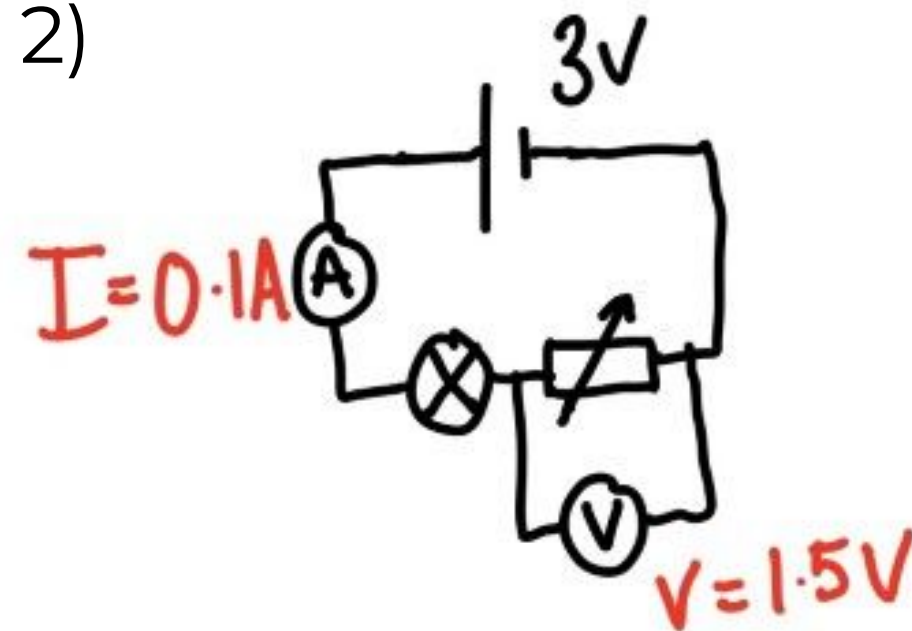
Independent practice

Calculate the potential difference across the lamp, and calculate the resistance of the lamp in both of these circuits.

1)



2)



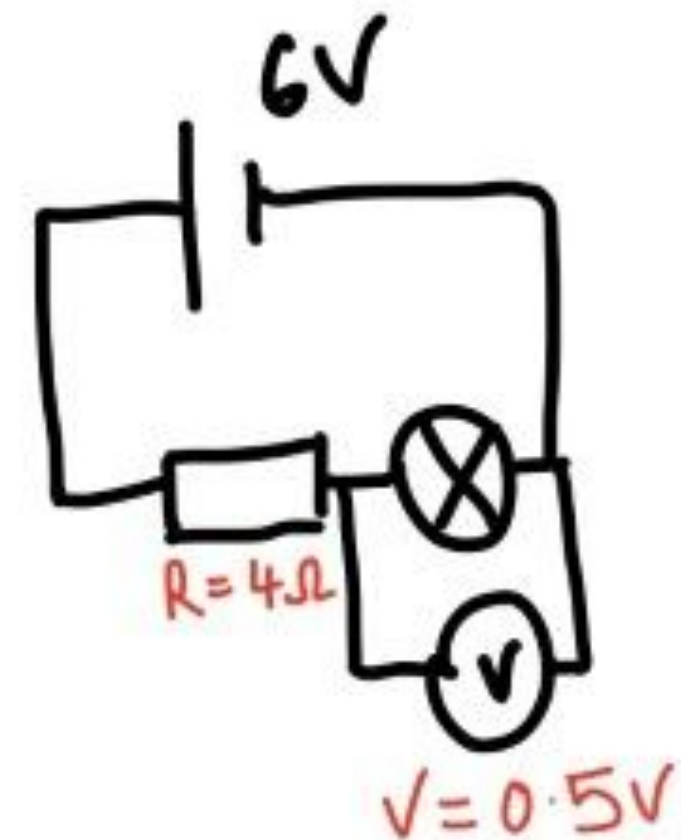
Images, Miss Walrond



Independent practice

Calculate:

- a) The potential difference across the resistor
- b) The current through the resistor
- c) The current through the lamp
- d) The resistance of the lamp
- e) The total circuit resistance

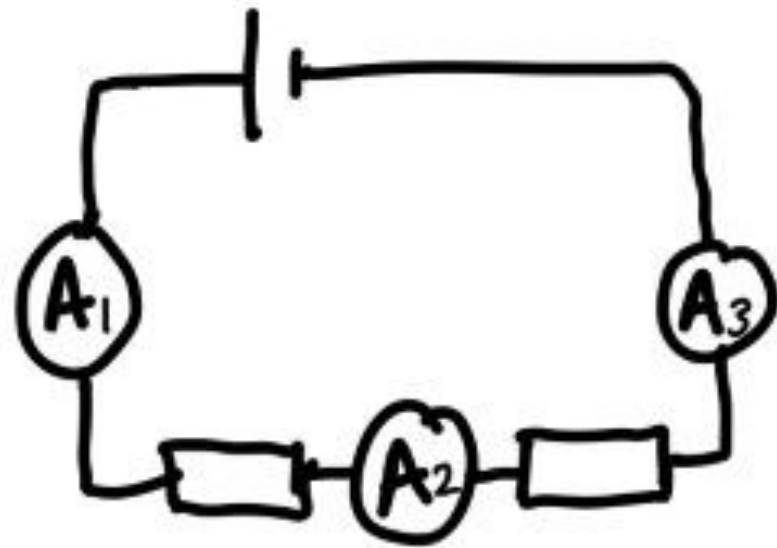


Answers



Review: Current in series circuits

1)

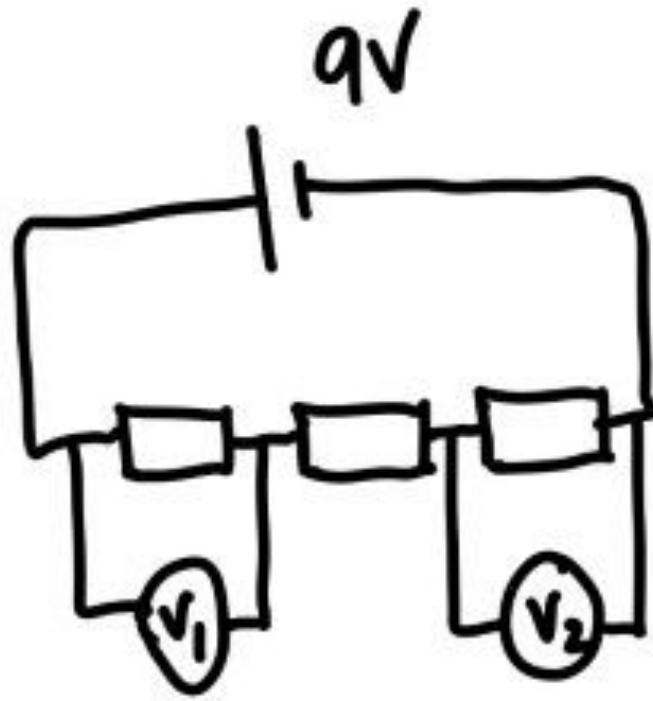


2) If the current in ammeter 2 is 1.8 A, then the current in ammeter 1 will be **1.8 A** and the current in ammeter 3 will be **1.8 A**.



Review: Potential difference in series circuits

1)



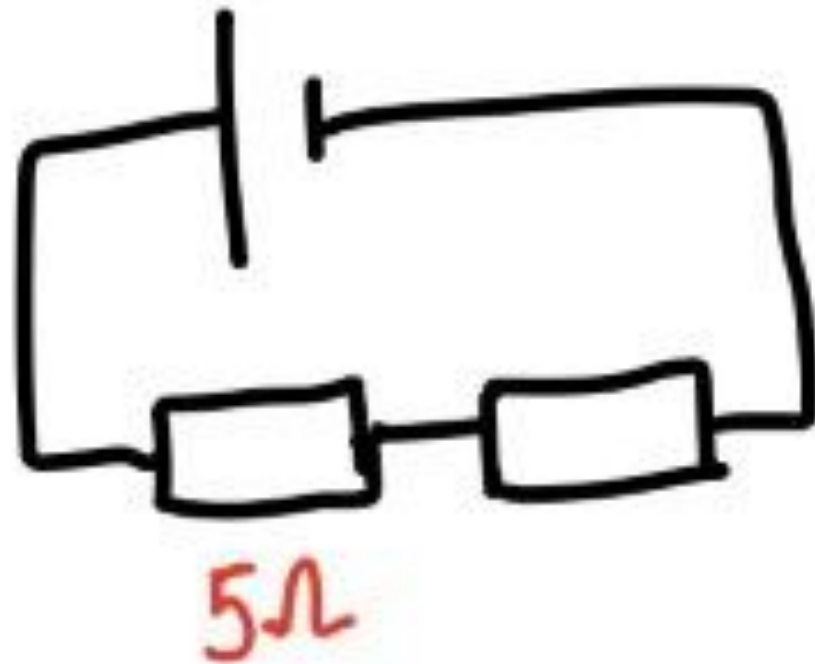
2) **$V = 3 V$**

If $V_1 = 2 V$ and $V_2 = 4 V$ then: $9 = 2 + V + 4,$ so **$V = 9 - 2 - 4 = 3 V$**



Review: Resistance in series circuits

1)



2) **$R = 15\ \Omega$**

If the total resistance is $20\ \Omega$. Then:

$$20 = 5 + R,$$

$$\text{so } \mathbf{R = 20 - 5 = 15\ \Omega}$$

3) Total potential difference = total current $\times$ total resistance

$$6 = 0.3 \times R$$

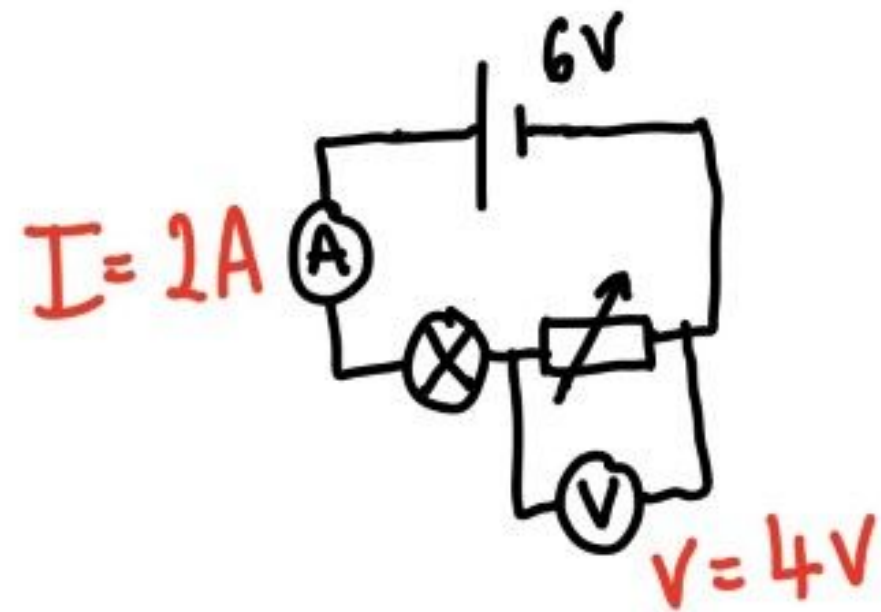
$$\mathbf{R = 6 / 0.3 = 20\ \Omega}$$



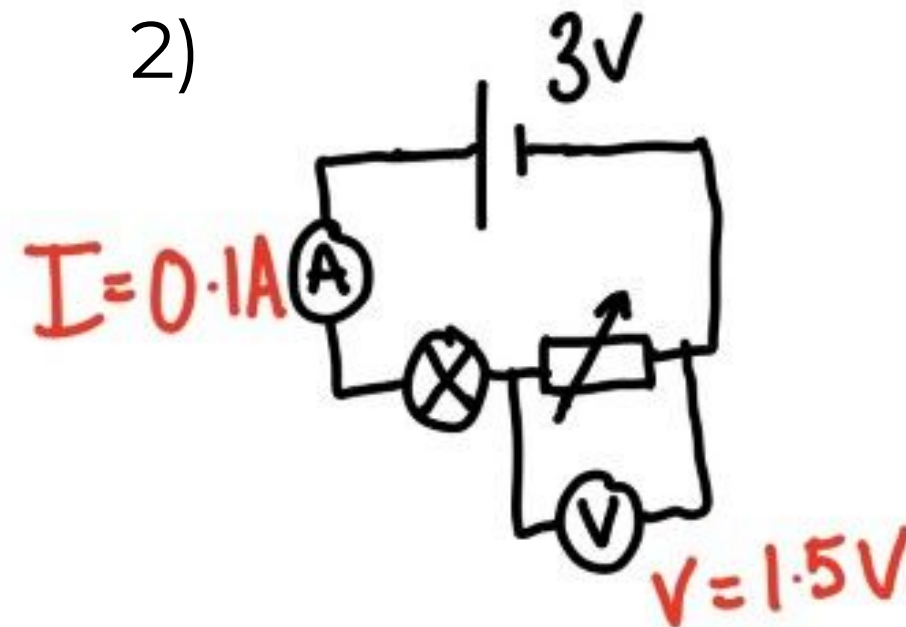
Review: Independent practice

Calculate the potential difference across the lamp, and calculate the resistance of the lamp.

1)



2)



1) $V = 2V, R = 1 \square$

2) $V = 1.5V, R = 15 \square$



Review: Independent practice

Calculate:

- a) The potential difference across the resistor **5.5 V**
- b) The current through the resistor **1.375 A**
- c) The current through the lamp **1.375 A**
- d) The resistance of the lamp **0.36 Ω**
- e) The total circuit resistance **4.36 Ω**

