Shanna

PSC-4012 Ohm's Law: V=IR

1. If a 6-V battery produces a 0.33-A current through a flashlight, what is the resistance of the light bulb filament?

$$R = \frac{V}{I} = \frac{6V}{0.33A} - \boxed{18.18 \text{ N}}$$

2. Calculate the current intensity in a 300- Ω component powered directly by a 120-V power supply.

$$I = \frac{V}{R} = \frac{120V}{300SL} = 0.4 A$$

3. A 9-V battery produces a 0.5-A current through an electronic scale. What is the resistance of the scale?

$$R = \frac{V}{I} = \frac{9V}{0.5A} = \boxed{18 \Omega}$$

4. A 1.7-A current runs through a television. The resistance of the television is 71Ω . What is the voltage of the power supply?

5. A stove is plugged in to a 240 V outlet. The resistance of the stove is 113Ω . What is the current through the stove?

$$I = \frac{V}{R} = \frac{240V}{113 \Omega} = 2.12 A$$

6. A 12-V battery produces a 2.5A current through an electronic game. What is the resistance of the game?

$$R = \frac{V}{I} = \frac{12V}{2.5A} = 4.8-2$$

7. An electric clothes dryer is plugged into a 240V outlet. The resistance of the dryer is 135 Ω . What is the current through the dryer?

$$T = \frac{V}{R} = \frac{240V}{1350} = 1.78A$$

8. If we have a resistor of 40 Ω , and we measure the current as 15 A, what is the emf of the power supply?

9. A current of 9mA flows through a circuit that has an emf of 3 volts. What is the resistance of the device?

$$R = \frac{1}{T} = \frac{3V}{0.009A} = \begin{bmatrix} 333.33 \Omega \end{bmatrix}$$

10. A simple circuit is created using a battery and a light bulb. When lit, the bulb has a resistance of 9 Ω and a recommended current intensity of 450mA. What emf does the battery require?

$$V = IR = (0.45A)(9-0)$$

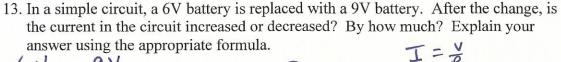
= $[4.05V]$

11. In a simple circuit, a 12V battery is replaced with a 9V battery. After the change, is the current in the circuit increased or decreased? By how much? Explain your answer using the appropriate formula.

Before After
$$\frac{After}{Before} = \frac{9V}{12V} = \frac{3}{4}X$$
 $I = \frac{V}{R}$ If $VV = \frac{3}{4}X$ then $IV = \frac{3}{4}X$

12. In a simple circuit, a 9V battery is replaced with a 12V battery. After the change, is the current in the circuit increased or decreased? By how much? Explain your 9V 12V $\frac{A}{B} = \frac{12V}{9V} = \frac{4}{3}X \uparrow$ If $V \uparrow \frac{4}{3}X$ before after

$$\frac{A}{B} = \frac{12V}{9V} = \frac{4}{3} \times \Lambda$$



answer using the appropriate formula.

$$6V$$
 $9V$
 8
 A
 $\frac{9V}{6V} = \frac{3}{2}X \uparrow$

If $V \uparrow \frac{3}{2}X$

Then

 $1 \uparrow \uparrow \frac{3}{2}X$

14. In a simple circuit, a 12V battery is replaced with a 6V battery. After the change, is the current in the circuit increased or decreased? By how much? Explain your answer using the appropriate formula.

answer using the appropriate formula.

12 V GV

B

A

$$\frac{6V}{12V} = \frac{1}{2}X$$

If $VV^{\frac{1}{2}}X$

Then $IV^{\frac{1}{2}}X$

15. In a simple circuit, a 9V battery is replaced with a 6V battery. After the change, is the current in the circuit increased or decreased? By how much? Explain your answer using the appropriate formula.

T =
$$\frac{1}{8}$$

B

A

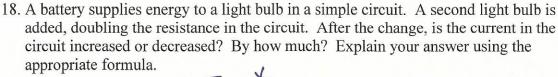
 $\frac{6V}{9V} = \frac{2}{3}XV$
 $\frac{2}{3}X$
 $\frac{2}{3}X$
 $\frac{2}{3}X$

16. In a simple circuit, a 3V battery is replaced with a 9V battery. After the change, is the current in the circuit increased or decreased? By how much? Explain your answer using the appropriate formula.

$$3V \quad 9V \quad \frac{9V}{3V} = 3X \uparrow \qquad \boxed{1 - R}$$

$$V \uparrow 3X \quad \therefore \quad \boxed{1 \uparrow 3X}$$

17. If the resistance in a circuit is tripled, how is the current affected? Explain using the appropriate formula.



$$T = \frac{1}{R}$$

If $R \wedge \Delta X$.. $I \vee \frac{1}{2} X$

19. A battery supplies energy to a light bulb in a simple circuit. One of the light bulbs is removed, reducing the resistance in the circuit by half. After the change, is the current in the circuit increased or decreased? By how much? Explain your answer using the appropriate formula.

20. In a simple circuit, a 20Ω resistor is replaced with a 30Ω resistor. After the change, is the current in the circuit increased or decreased? By how much? Explain your answer using the appropriate formula.

20.12 30.12
$$\frac{A}{B} = \frac{30}{20} = \frac{3}{2} \times \uparrow$$
 $\frac{T = \frac{1}{R}}{H R \uparrow \frac{3}{2} \times 1}$ then $T \sqrt{\frac{2}{3}} \times 1$.

- 21. Of the following: *directly proportional / indirectly proportional*Place the appropriate expression in each space below:
 - a) Voltage is directly proper tional to current intensity.
 - b) Resistance is <u>indirectly proportional</u> to current intensity.
- 22. Of the following: *increases* / *decreases* Place the appropriate expression in each space below:
 - a) As resistance in a circuit increases, current intensity do coo and
 - b) As resistance in a circuit decreases, current intensity ________.
 - c) As voltage in a circuit increases, current intensity ________.
 - d) As voltage in a circuit decreases, current intensity _____ de Cre a ser