Ohm's Law and Power Equation Practice Worksheet

Name_____
Period_____
Date_____

Show all four steps for each problem
STEP1 - RECORD INFO
STEP 2 - WRITE EQUATION
STEP 3 - SUBSTITUTE IN THE EQUATION
STEP 4 - SOLVE

1. Find the current through a 12-ohm resistive circuit when 24 volts is applied.

2. Find the resistance of a circuit that draws 0.06 amperes with 12 volts applied.

3. Find the applied voltage of a circuit that draws 0.2 amperes through a 4800-ohm resistance.

4. Find the applied voltage of a telephone circuit that draws 0.017amperes through a resistance of 15,000 ohms.

5. A 20-volt relay has a coil resistance of 200 ohms. How much current does it draw?

6. A series circuit has 1200-ohms of total resistance with 12 V as the power supply.
   What is the total current of this circuit?

7. What is the **increase** of current when 15 V is applied to 10000-ohm. rheostat, which is adjusted to 1000-ohm value?

8. A transformer is connected to 120 volts. Find the current if the resistance is 480-ohms?

9. A resistive load of 600-ohms is connected to a 24 V power supply. Find the current through the resistor.

10. A circuit consists of a 12 V battery connected across a single resistor. If the current in the circuit is 3 A, calculate the size of the resistor.

11. If a small appliance is rated at a current of 10 amps and a voltage of 120 volts, the power rating would be _____ Watts. (P = I V)

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12. If a blender is plugged into a 110 V outlet that supplies 2.7 A of current, what amount of power is used by the blender?

13. If a clock expends 2 W of power from a 1.5 V battery, what amount of current is supplying the clock?

14. Tommy runs his juicer every morning. The juicer uses 90 W of Power and the current supplied is 4.5 A. How many volts are necessary to run the juicer?

15. Amanda's hair dryer requires 11A of current from a 110 V outlet. How much power does it use?

16. A DC electric motor transforms 1.50 kW of electrical power into mechanical form. If the motor's operating voltage is 300 volts, how much current does it "draw" when operating at full load (full power output)?

Challenge
Calculate the amount of power dissipated by this electric heating element, if the generator's output voltage is 110 volts and the heater's resistance is 2.5 ohms: ($P = V^2/ R$)
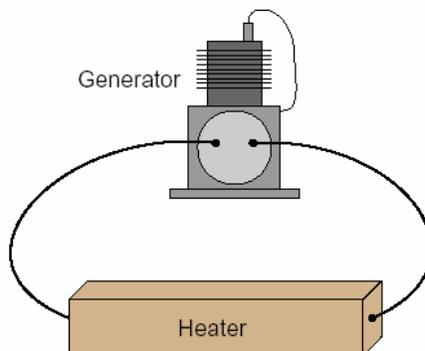
Now, calculate the power dissipated by the same heater if the generator's output voltage is doubled.

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Answers

1. I=E/R = 24/12= 2 amperes
2. R=E.I = 12/.06 = 200 ohms
3. E = IR = (0.2)(4800) = 960 volts
4. E=IR = (.017)(15000) = 255 volts
5. I= 0. 5 A or 45 mA
6. I= 0.01A or 10mA
7. I= 0.0135 A or 13.5 mA
8. I= 0.25 A or 250 mA
9. I = 0.04 A or 40 mA
10. R= 4 Ω
11. P=IV=(10)(120v)=1200 W
12. P=IV=(2.7)(110v)= 297 W
13. P=IV; I = P/V= 2 W/1.5 V = 1.3 A
14. P=IV; V= P/I = 90 W/ 4.5 A = 20 V
15. P=IV=(11 A)(110V)=1210 W
16. P=IV; I = P/V= 1500 W/ 300 V = 5 A

Challenge

110 v
$P = V^2/ R = (110 v)^2 / 2.5$ ohms = 4840 Watts

Doubled voltage—220v
$P = V^2/ R = (220 v)^2 / 2.5$ ohms = 19360 Watts   **wow !**