Formula and Multiple Formulas Worksheet

1. What is the resistance of a resistor if a circuit is on for 28 minutes, used 25 000 J of energy and had 3 A?

$R = \frac{V}{I} = \frac{4.9}{3} =$ 1.7 Ω

$V = \frac{E}{It} = \frac{25000}{(3 \times 28 \times 60)} =$ 4.9 V

2. What is the resistance of a resistor if it used 0.9 A and 650 W of power?

$R = \frac{V}{I} = \frac{722.2}{.9} =$ 802.4 Ω

$V = \frac{P}{I} = \frac{650}{.9} =$ 722.2 V

3. What is the resistance of a resistor if it uses 920 V and 180 W of power?

$R = \frac{V}{I}$ $\frac{920}{.2} =$ 4600 Ω

$I = \frac{P}{V} = \frac{180}{920} =$ .2 A

4. What is the power of an appliance if it needs 220 V when it has a 10 Ω resistor?

$P = IV$

$220 \times 22 =$ 4840 W

$I = \frac{V}{R}$ $\frac{220}{10} =$ 22 A

5. What is the resistance of a resistor if a circuit is on for 30 minutes, used 20 000 J of energy and had 2 A?

$R = \frac{V}{I}$ $\frac{5.6}{2} =$ 2.8 Ω

$V = \frac{E}{It} = \frac{20000}{(2 \times 30 \times 60)} =$ 5.6 V

6. What is the power of an appliance in kW if it works on 7 A and has a 3.9 Ω resistor?

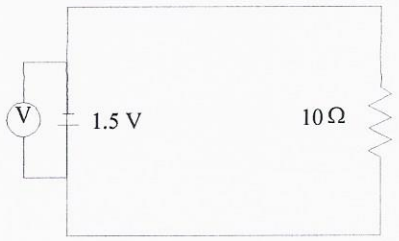
$P = IV$

$\frac{7 \times 27.3}{1000} =$ 0.19 kW

$V = RI$

$7 \times 3.9 =$ 27.3 V

7. How many joules of heat will the following circuit give off in exactly one hour of use?



$E = IVt$

$0.15A \times 1.5 \times 1 \times 3600 =$ 810 J

$I = \frac{V}{R}$ $\frac{1.5}{10} = 0.15A$

8. You connect a fan to a 12-V power source. The total resistance of the wires used is 10 Ω. You operate the fan for 20 min. How much energy is used by the wires during this period?

A) 4.8 J B) 288 J C) 2 400 J D) 17 280 J

$E = IVt$

$1.2 \times 12 \times 20 \times 60 = 17280$

$I = \frac{V}{R} = \frac{12}{10} = 1.2A$

9. The rating plate below indicates the characteristics of Jasmine's hair dryer

MODEL – J45-TX2	
110 V	1200 W

Jasmine took 35 minutes to dry her hair. How much energy did Jasmine use to dry her hair?

A) 3.85 kJ B) 72 kJ C) 2 520 kJ D) 2 520 000 kJ

$E = IVt$

$\frac{10.9 \times 110 \times 35 \times 60}{1000}$

$I = \frac{P}{V} = \frac{1200}{110} = 10.9A$

10. Some of the characteristics of an MP3 player are listed below.

- Potential difference: 3 V
- Electric current intensity: 0.1 A
- Energy stored in the battery: 21 600 J

Given the energy stored in its battery, what is the maximum amount of time this MP3 player can be used?

$t = \frac{E}{IV}$ $\frac{21600}{(3 \times 0.1)} = \frac{72000}{60} =$ 1200 min

11. Julie uses her computer to do her homework. What is the power of this computer given that it consumed 1 440 000 J of energy over a period of 2 hours?

$P = \frac{E}{t}$ $\frac{1440000}{(2 \times 3600)} =$ 200 W

12. What is the resistance of a resistor if a circuit is on for 3 hours, used 90 000 J of energy and 120 V?

$R = \frac{V}{I}$ $\frac{120}{0.069} =$ 1739 Ω $I = \frac{E}{Vt} = \frac{90000}{(120 \times 3 \times 3600)}$ 0.069 A

13. What was the potential difference of a computer that used 55 000 J of energy when it was on for 2 hours and had 1.2 A?

$V = \frac{E}{It}$ $\frac{55000}{(1.2 \times 2 \times 3600)} =$ 6.4 V

14. How much time passed in minutes when a computer did 700 000 J of work and had 550 W of power?

$t = \frac{700000}{550} = \frac{1272.7}{60}$ = 21.2 min

15. Each of these four appliances is used for one hour. Which one of these appliances is the most expensive to use?

Appliance 1	Appliance 2	Appliance 3	Appliance 4
800 W	1200 W	2 A 2×240	12 A 12×120
120 V	10 A	240 V 480 W	120 V 1440 W
60 Hz	120 V	60 Hz	

A) Appliance 1 B) Appliance 2 C) Appliance 3 D) Appliance 4