Practice for all formulas

Give the unit and symbol for the following:

	Unit (s)	Symbol
Current intensity	A	I
Potential difference	V	V
Voltage	V	V
Resistance	Ω	R
Power	W /kW	P
Energy	J / kJ / kwh	E
Time	S	t

In the table below fill in the appropriate triangle(s) used for each unknown.

Voltage	Power	Energy - 2 formulas

How would you convert the following time units:

Minutes to seconds __× 60__   W to kW   __÷ 1000__

J to kJ __÷ 1000__   J to kWh __÷ 3 600 000__

Seconds to hours __÷ 3600__   Seconds to minutes __÷ 60__

Hours to seconds __× 3600__

Using the above formulas and conversions, solve the following problems. Show all work.

1. What is the current intensity of a circuit with a resistance of 25 Ω and a potential difference of 25 V?

$$I = \frac{V}{R} \qquad \frac{25}{25} = \boxed{1 A}$$

2. What is the resistance of a circuit with a current intensity of 4 A and a potential difference of 50 V?

$$R = \frac{V}{I} \qquad \frac{50}{4} = \boxed{12.5 \, \Omega}$$

3. What is the power in kW when a dishwasher used 200 V and 2.5 A?

$$P = IV \qquad 200 \times 2.5 \div 1000 = \boxed{0.5 \, kW}$$

4. A radio is on for 3 hours and has 400 W of power. What is the energy in kWh?

$$E = Pt \qquad 400 \times 3 \times 3600 \div 3\,600\,000 = \boxed{1.2 \, kWh}$$

5. How much time elapsed in hours if a TV used 550 000 J of energy and needs 400 W of power?

$$t = \frac{E}{P} \qquad \frac{550\,000}{400} = \frac{1375}{3600} = \boxed{0.38 \, hrs}$$

6. A toaster takes 200 seconds to toast a piece of bread. If it uses 100 W of power how much energy will be used in J?

$$E = Pt \qquad 200 \times 100 = \boxed{20\,000 \, J}$$

7. A hairdryer is used for 30 minutes a day 5 days a week. It uses 220 V and 3.5 A. Calculate the energy used in J for the five days?

$$E = IVt \qquad 3.5 \times 220 \times 30 \times 60 \times 5 = \boxed{6\,930\,000 \, J}$$

8. How much energy in J does a computer use if it is on for 2 hours and uses 220 V and 2.0 A.

$$E = IVt = 2 \times 220 \times 2 \times 3600 = \boxed{3\,168\,000 \, J}$$

9. If a TV used 700 000 J of energy and 100 W of power. How many hours did you watch TV for?

$$t = \frac{E}{P} \qquad \frac{700\,000}{100} = \frac{700}{3600} = \boxed{0.19 \, hrs}$$

10. What is the potential difference when a microwave runs on 1.2 A and uses 300 W of power

$V = \dfrac{P}{I}$ $\dfrac{300}{1.2} =$ (250V)

11. An oven is used for 40 minutes to bake cookies. Its voltage is 100 V and its intensity is 4.5 A. How much energy was used in kJ to bake the cake?

$E = IVt$ $4.5 \times 100 \times 40 \times 60 \div 1000 =$ (1080 kJ)

12. How much time passed in minutes when a computer did 500 000 J of work and had 250 W of power?

$t = \dfrac{E}{P}$ $\dfrac{500000}{250} = \dfrac{2000}{60} =$ (33.3 min)

13. What is the power needed for a compute to be on for 4 hours which produced 5 000 J of energy?

$P = E/t$ $\dfrac{5000}{4 \times 3600} =$ (0.35 W)

14. What is the voltage of a circuit if it is using a 10 Ω resistor and 0.5 A of current?

$V = RI$ $10 \times 0.5 =$ (5V)

15. What is the voltage if an overhead 300 W of power and 1.5 A?

$V = \dfrac{P}{I}$ $\dfrac{300}{1.5} =$ (200 V)

16. What is the energy in kJ, if a blow dryer is used for 25 minutes and needs 2.5 A and 120 V?

$E = IVt$ $2.5 \times 120 \times 25 \times 60 \div 1000 =$ (450 kJ)

17. Explain why a 90 W light bulb will produce less energy that a 120 W light bulb, but more energy that a 60 W light bulb.

a 90 W LB will have more I and or V than the 60 W LB, but less I and or V than the 120 W LB.