

Multiple Formulas

| Potential difference | Power | Energy 1 | Energy 2 |
|----------------------|-------|----------|----------|
| | | | |

1. What is the power of an appliance if it works on 2.5 A and has a 5 Ω resistor?

$$P = I V$$

$$2.5 \times 12.5 \quad V = R I$$

$$5 \times 2.5 = 12.5 V$$

31.25 W

2. What is the resistance of a resistor if it uses 220 V and 300 W of power?

$$R = \frac{V}{I} \quad \frac{220}{1.4}$$

$$I = \frac{P}{V} \quad \frac{300}{220} = 1.4 A$$

$$= 157 \Omega$$

3. What is the resistance of a resistor if a circuit is on for 20 minutes, used 20 000 J of energy and had 4 A?

$$R = \frac{V}{I} \quad \frac{4.2}{4}$$

$$V = \frac{E}{It} \quad \frac{20000}{4 \times 20 \times 60}$$

$$\frac{20000}{4800} = 4.2 V$$

4. What is the resistance of a resistor if a circuit is on for 2 hours, used 50 000 J of energy and 220 V?

$$R = \frac{V}{I} \quad \frac{220}{0.032}$$

$$I = \frac{E}{Vt} \quad \frac{50000}{220 \times 2 \times 3600}$$

$$\frac{50000}{1584000} = 0.032 A$$

5. What is the power of an appliance if it works on 5 A and has a 3.5 Ω resistor?

$$P = I V$$

$$5 \times 17.5$$

$$V = R I$$

$$5 \times 3.5$$

$$= 17.5 V$$

87.5 W

6. The resistance of a heating element is 10 Ω and the potential difference (voltage) across its terminals is 120 V. This element is used for 3 hours. How much electrical energy was used during this period?

- A) 4 320 J B) 259 200 J C) 1440 000 J D) 15 552 000 J

$$E = I V t$$

$$12 \times 120 \times 3 \times 3600$$

$$I = \frac{120}{10} = 12 A$$