Multiple Formulas

Potential difference	Power	Energy 1	Energy 2
V / R | I	P / I | V	E / P | t	E / I | V | t

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

$P = IV$

$2.5 \times 12.5 = 31.25\ W$

$V = R \times I$

5×2.5

$12.5\ V$

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

$R = \frac{V}{I}$ $\frac{220}{1.4} = 157.1\ \Omega$

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

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?

$R = \frac{V}{I}$ $\frac{4.2}{4}$ $1.04\ \Omega$

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

$4.2\ V$

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?

$\Omega = \frac{V}{I}$ $\frac{220}{.032}$ $6875\ \Omega$

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

$.032\ A$

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

$P = IV$

$5 \times 17.5 = 87.5\ W$

$V = RI$

3.5×5

$17.5\ V$

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

$E = IVt$

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

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