Circuits 3

① a) $P = IV$

$$I = \frac{P}{V} = \frac{150}{120} = \boxed{1.25\ A}$$

b) $V = IR$

$$R = \frac{V}{I} = \frac{120}{1.25} = \boxed{96\ \Omega}$$

② $P = IV = (0.1)(1.4) = \boxed{0.14\ W}$

③ $I = \frac{P}{V} = \frac{800}{120} = \boxed{6.67\ A}$

④ $P = 840\ W = 0.840\ kW$

$E = P \cdot t = (0.840\ kW)(8\ h) = 6.72\ kW \cdot h$

$\text{cost} = 6.72\ kWh \cdot \$0.080 = \boxed{\$0.54}$

⑤ $P = 100\ W = 0.1\ kW$

$t = 30\ \text{days} \times \frac{24\ h}{\text{day}} \times 0.25 = 180\ h$

$E = P \cdot t = (0.1)(180) = 18\ kWh$

$\text{cost} = (18)(0.080) = \boxed{\$1.44}$

(6) $P = 150\ W = 0.15\ kW$

$t = 30\ \text{days} \times \frac{12\ h}{\text{day}} = 360\ h = 1\ 296\ 000\ s$

kWh

$E = P \cdot t$

$= (0.15)(360)$

$E = \boxed{54\ kWh}$

Joules

$E = P \cdot t$

$= (150)(1\ 296\ 000)$

$E = \boxed{1.944 \times 10^8\ J}$

(7) $P = 100\ W = 0.1\ kW$

$t = 30\ \text{days} \times \frac{8\ h}{\text{day}} = 240\ h$

$E = P \cdot t = (0.1)(240) = 24\ kWh$

$\text{cost} = (24)(0.075) = \boxed{\$1.80}$

(8) a) $P = \frac{V^2}{R}$

$V = \sqrt{PR} = \sqrt{(1.0)(100)} = \boxed{10\ V}$

b) $I = \frac{V}{R} = \frac{10}{100} = \boxed{0.1\ A}$

(9) a) $P = \frac{V^2}{R}$

$R = \frac{V^2}{P} = \frac{130^2}{40} = \boxed{422.5\ \Omega}$

b) $\frac{422.5}{31} = 13.6$ times as much resistance

c) As temperature increases, so does resistance.