

$$8. \text{ A) } R = \frac{V}{I} = \frac{12}{0.25} = 48 \Omega$$

$$\text{B) } R = \frac{V}{I} = \frac{1.5}{0.03} = 50 \Omega$$

$$\text{C) } V = I \times R \\ = 0.45 \times 30 \\ = 13.5 \text{ V}$$

$$\text{D) } V = I \times R \\ = 1.5 \times 2200 \\ = 3300 \text{ V}$$

$$\text{E) } I = \frac{V}{R} = \frac{6}{18} = 0.33 \text{ A}$$

$$\text{F) } I = \frac{V}{R} = \frac{56}{26} \\ = 2.15 \text{ A}$$

$$9. \text{ A) } E = 150 \text{ J} \quad P = \frac{E}{t} = \frac{150}{1.5} = 100 \text{ W} \\ t = 1.5 \text{ sec} \\ P = ?$$

$$\text{B) } E = 2400 \text{ J} \quad P = \frac{E}{t} = \frac{2400}{16} = 150 \text{ W} \\ t = 16 \text{ sec} \\ P = ?$$

$$10. \text{ A) } V = 120 \text{ V} \quad I = \frac{P}{V} = \frac{60}{120} = 0.5 \text{ A} \\ P = 60 \text{ W} \\ I = ?$$

$$\text{B) } P = 120 \text{ W} \quad I = \frac{P}{V} = \frac{120}{120} = 1 \text{ A} \\ V = 120 \text{ V} \\ I = ?$$

$$11. \quad I = 14 \text{ A}$$

$$t = 10 \text{ min} \xrightarrow{\text{convert}} 10 \text{ min} \times \frac{60 \text{ sec}}{1 \text{ min}} = 600 \text{ sec}$$

$$\text{A) } Q = ? \quad Q = I \times t \\ = 14 \times 600 \\ = 8400 \text{ C}$$

$$\text{B) } V = 120 \text{ V} \quad E = V \times Q \\ E = ? \quad = 120 \times 8400 \\ = 1,080,000 \text{ J} \\ \text{OR} \\ 1.08 \times 10^6 \text{ J}$$

$$12. \quad E = ?$$

$$V = 12 \text{ V}$$

$$I = 2.5 \text{ A}$$

$$t = 3.0 \text{ h} \xrightarrow{\text{convert}} 3.0 \text{ h} \times \frac{60 \text{ min}}{1 \text{ h}} \times \frac{60 \text{ sec}}{1 \text{ min}} = 10,800 \text{ sec}$$

$$E = V \cdot t \cdot I \\ = (12)(10,800)(2.5) \\ = 324,000 \text{ J}$$

$$\text{OR} \quad P = I \cdot V \\ = (2.5)(12) \\ = 30 \text{ W}$$

$$E = P \cdot t \\ = (30)(10,800) \\ = 324,000 \text{ J}$$

13. 500,000 houses

$$P = 100W$$

$$t = 90h$$

A) $E_{\text{wasted}} = ?$

one lightbulb

$$E = P \cdot t$$

$$= 100W \cdot 90h$$

$$= 9000W \cdot h$$

→
convert
to kW

$$= 9000W \cdot h \times \frac{1kW}{1000W}$$

$$= 9kW \cdot h$$

500,000 houses of 500,000 lightbulbs

$$E = 9kW \cdot h \times 500,000$$

$$E = 4,500,000 kW \cdot h \text{ wasted}$$

B) total cost = ?
of wasted
Energy

price = $\frac{\$0.20}{kW \cdot h}$

$$\text{price} = \frac{\$0.20}{kW \cdot h}$$

cost = energy used \times price of electricity

$$\text{cost} = 4,500,000 \cancel{kW \cdot h} \times \frac{\$0.20}{\cancel{kW \cdot h}}$$

$$\text{cost} = \$900,000$$

↑
wasted money for 500,000 house

one lightbulb

$$\text{cost} = 9kW \cdot h \times \frac{\$0.20}{kW \cdot h}$$

$$= \$1.8 \text{ per year}$$