

Solutions

Each answer shows the steps, then the **result**.

2.1

$$P = IV = (3.0 \text{ A})(12 \text{ V})$$

- $P = \mathbf{36 \text{ W}}$

2.2

$$P = I^2 R = (2.0 \text{ A})^2 (6.0 \Omega)$$

- $P = \mathbf{24 \text{ W}}$

2.3

$$E = Pt = (60 \text{ W})(120 \text{ s})$$

- $E = \mathbf{7200 \text{ J}}$

3.1 A

- IV .

3.2 B

- V^2/R .

3.3

(a)

$$I = \frac{V}{R} = \frac{240 \text{ V}}{60 \Omega}$$

- $I = \mathbf{4.0 \text{ A}}$

(b)

$$P = IV = (4.0 \text{ A})(240 \text{ V})$$

- $P = \mathbf{960 \text{ W}}$

3.4

(a)

$$I = \frac{V}{R} = \frac{18 \text{ V}}{9.0 \Omega} = \mathbf{2.0 \text{ A}}$$

$$P = IV = (2.0 \text{ A})(18 \text{ V}) = \mathbf{36 \text{ W}}$$

(b)

$$E = Pt = (36 \text{ W})(60 \text{ s}) = \mathbf{2160 \text{ J}}$$

- at fixed V , $P = \frac{V^2}{R}$, so doubling R halves P : $P = \frac{(18 \text{ V})^2}{18 \Omega} = \mathbf{18 \text{ W}}$