2–11 Determine the specific kinetic energy of a mass whose velocity is 30 m/s, in kJ/kg.

$$KE = \frac{mV^2}{2}$$

$$ke = \frac{KE}{m} = \frac{V^2}{2} = \frac{30^2}{2} = \frac{900}{2}$$

$$= 450 \frac{J}{kg} = 450 \frac{\left(\frac{1}{1000} kJ\right)}{kg}$$

$$= \frac{450}{1000} \frac{kJ}{kg}$$

$$= 0.45 \frac{kJ}{kg}$$

$$\frac{J}{kg} = \frac{N \cdot m}{kg} = \frac{\left(kg \times \frac{m}{s^2}\right) \cdot m}{kg}$$

$$= \frac{kg \frac{m^2}{s^2}}{kg} = \frac{m^2}{s^2}$$

2–14 An object whose mass is 100 kg is located 20 m above a datum level in a location where standard gravitational acceleration exists. Determine the total potential energy, in kJ, of this object.

$$PE = mgz$$

$$= 100 \times 9.81 \times 20$$

$$\quad \text{kg} \quad \frac{\text{m}}{\text{s}^2} \quad \text{m}$$

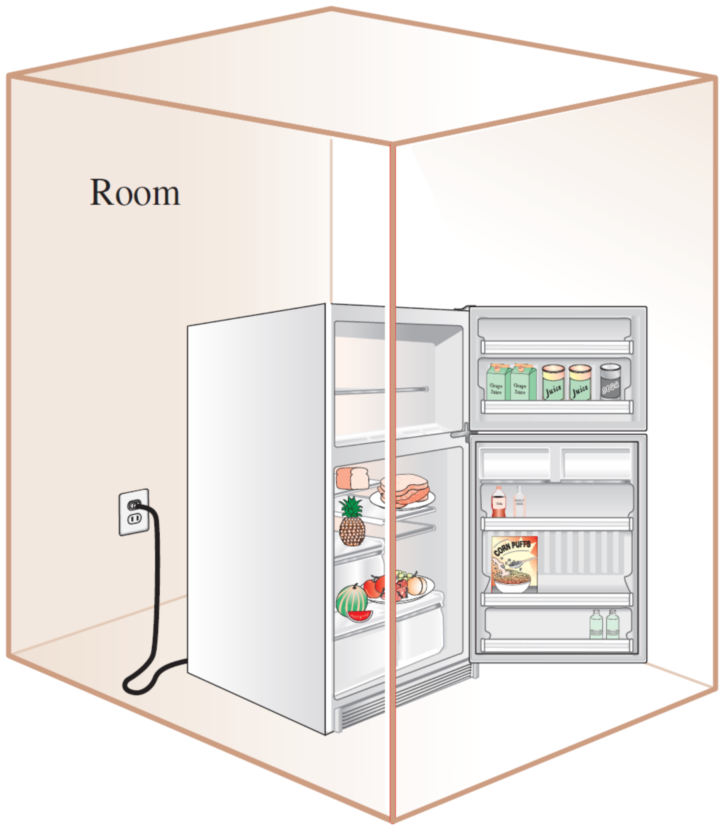
$$= 19620 \text{ J} = 19620 \left(\frac{1}{1000}\text{ kJ}\right)$$

$$= \frac{19620}{1000}\text{ kJ}$$

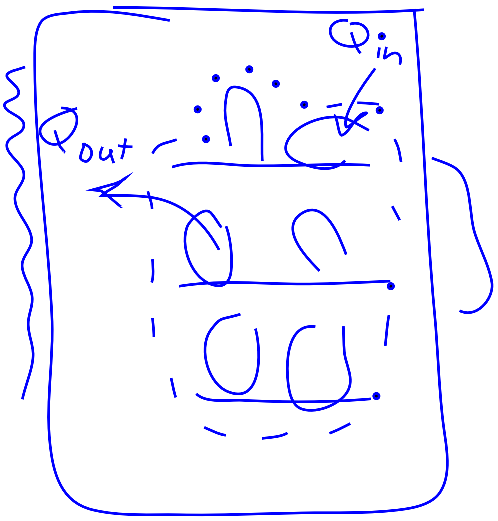
$$= 19.62 \text{ kJ}$$

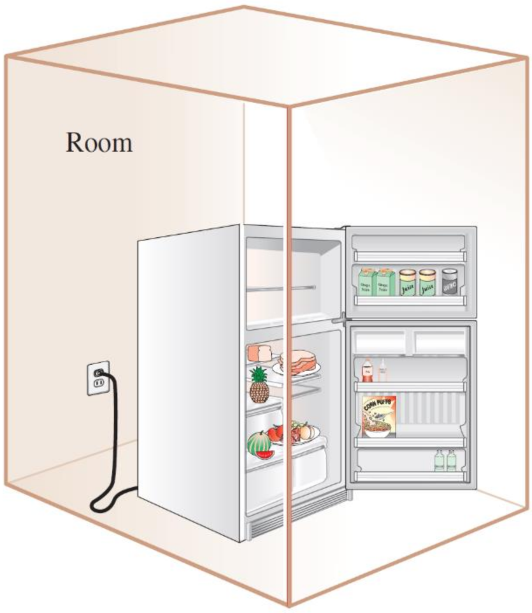
2–19C Consider an electric refrigerator located in a room. Determine the direction of the work and heat interactions (in or out) when the following are taken as the system: (*a*) the contents of the refrigerator, (*b*) all parts of the refrigerator including the contents, and (*c*) everything contained within the room during a winter day.

(8th Edition)

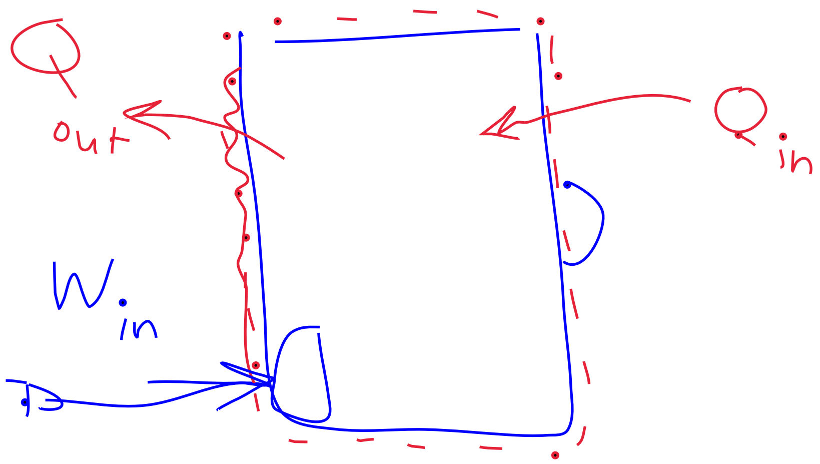


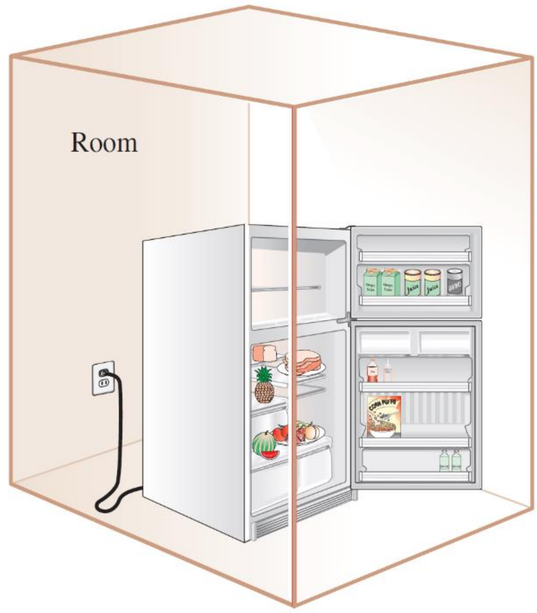
(a) Contents of the refrigerator



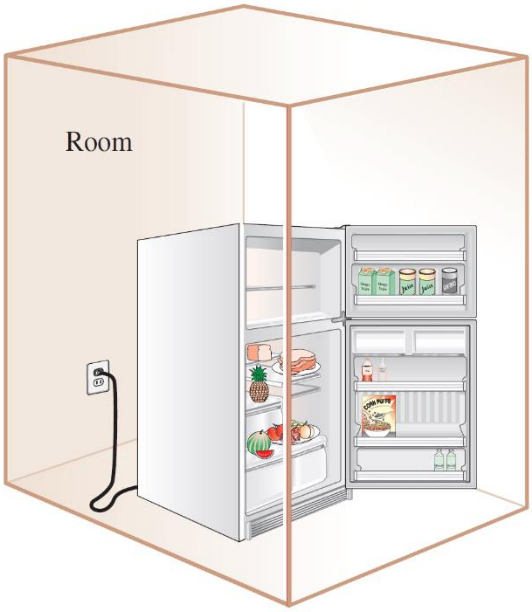


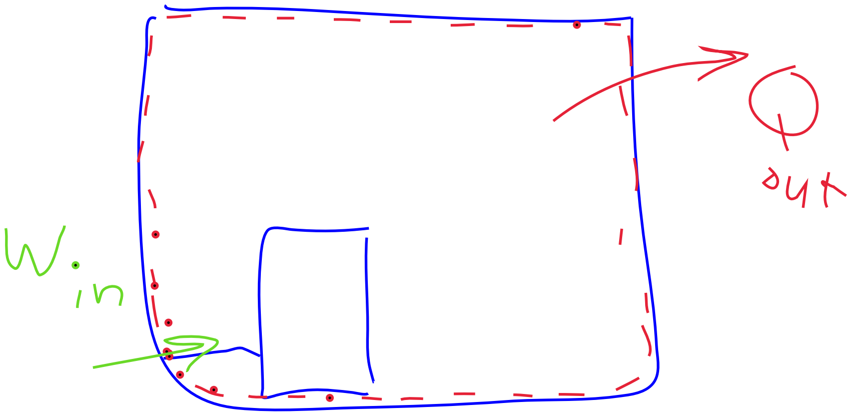
(b) All parts of the refrigerator including the content





(c) Everything contained within the room during a winter day





(d) during a summer day