

### Solution 1.14

A plastic tank is filled with water. The weight of the combined system is to be determined.

**Assumptions** The density of water is constant throughout.

**Properties** The density of water is given to be  $\rho = 1000 \text{ kg/m}^3$ .

**Analysis** The mass of the water in the tank and the total mass are

$$m_w = \rho V = (1000 \text{ kg/m}^3)(0.2 \text{ m}^3) = 200 \text{ kg}$$

$$m_{\text{total}} = m_w + m_{\text{tank}} = 200 + 3 = 203 \text{ kg}$$

Thus,

$$W = mg = (203 \text{ kg})(9.81 \text{ m/s}^2) \left( \frac{1 \text{ N}}{1 \text{ kg} \cdot \text{m/s}^2} \right) = \mathbf{1991 \text{ N}}$$

