5.8. **Visualize:** Please refer to Figure EX5.8.
Solve: Mass is defined to be

$$m = \frac{1}{\text{slope of the acceleration-versus-force graph}}$$

A larger slope implies a smaller mass. We know $m_2 = 0.20$ kg, and we can find the other masses relative to m_2 by comparing their slopes. Thus

$$\frac{m_1}{m_2} = \frac{1/\text{slope } 1}{1/\text{slope } 2} = \frac{\text{slope } 2}{\text{slope } 1} = \frac{1}{5/2} = \frac{2}{5} = 0.40$$
$$\Rightarrow m_1 = 0.40 m_2 = 0.40 \times 0.20 \text{ kg} = 0.08 \text{ kg}$$

Similarly,

$$\frac{m_3}{m_2} = \frac{1/\text{slope } 3}{1/\text{slope } 2} = \frac{\text{slope } 2}{\text{slope } 3} = \frac{1}{2/5} = \frac{5}{2} = 2.50$$
$$\Rightarrow m_3 = 2.50 m_2 = 2.50 \times 0.20 \text{ kg} = 0.50 \text{ kg}$$

Assess: From the initial analysis of the slopes we had expected $m_3 > m_2$ and $m_1 < m_2$. This is consistent with our numerical answers.