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 \( m_2 = 0.20 \text{ kg} \), and we can find the other masses relative to \( m_2 \) by comparing their slopes. Thus

\[
\frac{m_1}{m_2} = \frac{1}{\text{slope 1}} = \frac{\text{slope 2}}{\text{slope 1}} = \frac{1}{5/2} = \frac{2}{5} = 0.40
\]

\[ \Rightarrow m_1 = 0.40m_2 = 0.40 \times 0.20 \text{ kg} = 0.08 \text{ kg} \]

Similarly,

\[
\frac{m_3}{m_2} = \frac{1}{\text{slope 3}} = \frac{\text{slope 2}}{\text{slope 3}} = \frac{1}{2/5} = \frac{5}{2} = 2.50
\]

\[ \Rightarrow m_3 = 2.50m_2 = 2.50 \times 0.20 \text{ kg} = 0.50 \text{ kg} \]

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.