

Problem 1-10

Represent each of the following combinations of units in the correct SI form: (a) $\text{GN} \cdot \mu\text{m}$, (b) $\text{kg}/\mu\text{m}$, (c) N/ks^2 , and (d) $\text{kN}/\mu\text{s}$.

Solution**Part (a)**

$$1 \cancel{\text{GN}} \cdot \cancel{\mu\text{m}} \times \frac{10^9 \text{ N}}{1 \cancel{\text{GN}}} \times \frac{1 \text{ m}}{10^6 \cancel{\mu\text{m}}} = 1000 \text{ N} \cdot \text{m} = 1 \text{ kN} \cdot \text{m} = 1 \text{ N} \cdot \text{km}$$

Part (b)

$$\frac{1 \text{ kg}}{1 \cancel{\mu\text{m}}} \times \frac{10^6 \cancel{\mu\text{m}}}{1 \text{ m}} = 10^6 \frac{\text{kg}}{\text{m}} = 10^9 \frac{\text{g}}{\text{m}} = 1 \frac{\text{Gg}}{\text{m}}$$

Part (c)

$$\frac{1 \text{ N}}{1 \cancel{\text{ks}}^2} \times \left(\frac{1 \cancel{\text{ks}}}{1000 \text{ s}} \right)^2 = 10^{-6} \frac{\text{N}}{\text{s}^2} = 1 \frac{\mu\text{N}}{\text{s}^2}$$

Part (d)

$$1 \frac{\cancel{\text{kN}}}{\cancel{\mu\text{s}}} \times \frac{1000 \text{ N}}{1 \cancel{\text{kN}}} \times \frac{10^6 \cancel{\mu\text{s}}}{1 \text{ s}} = 10^9 \frac{\text{N}}{\text{s}} = 1 \frac{\text{GN}}{\text{s}}$$