

Problem 1-18

Evaluate each of the following to three significant figures and express each answer in SI units using an appropriate prefix: (a) $354 \text{ mg}(45 \text{ km})/(0.0356 \text{ kN})$, (b) $(0.00453 \text{ Mg})(201 \text{ ms})$, (c) $435 \text{ MN}/23.2 \text{ mm}$.

Solution

Part (a)

$$\frac{(354 \text{ mg})(45 \text{ km})}{0.0356 \text{ kN}} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ N}}{1000 \text{ N}} \approx 0.447 \frac{\text{kg} \cdot \text{m}}{\text{N}}$$

Part (b)

$$(0.00453 \text{ Mg})(201 \text{ ms}) \times \frac{10^6 \text{ g}}{1 \text{ Mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{1 \text{ s}}{1000 \text{ ms}} \approx 0.911 \text{ kg} \cdot \text{s}$$

Part (c)

$$\frac{435 \text{ MN}}{23.2 \text{ mm}} \times \frac{1000 \text{ mm}}{1 \text{ m}} \times \frac{10^6 \text{ N}}{1 \text{ MN}} \approx 1.88 \times 10^{10} \frac{\text{N}}{\text{m}} = 18.8 \frac{\text{GN}}{\text{m}}$$