

Chapter 1 Problem 21 †

Given

$$\text{volume} = 1 \text{ m}^3$$

$$1 \text{ cm} = 10^{-2} \text{ m}$$

Solution

Convert the volume into cubic centimeters.

First recognize that m^3 is really meters times meters times meters.

$$1 \text{ m}^3 = 1 \text{ m} \cdot \text{m} \cdot \text{m} \left(\frac{1 \text{ cm}}{10^{-2} \text{ m}} \right) \left(\frac{1 \text{ cm}}{10^{-2} \text{ m}} \right) \left(\frac{1 \text{ cm}}{10^{-2} \text{ m}} \right)$$

Meters in the numerator and denominator cancel giving

$$10^6 \text{ cm} \cdot \text{cm} \cdot \text{cm} = 10^6 \text{ cm}^3$$

†Problem from Essential University Physics, Wolfson