

CHEQ 1094 SIGNIFICANT FIGURES, UNITS, and DENSITY

- Give the number of significant figures in:  
 (a) 13.27 g (b) 0.00347 L (c) 4.2040 cm (d) 280.0 km
- Round off the following to three significant figures:  
 (a) 3883 (b) 6.4080 (c) 89.98 (d) 40.006 (e) 0.0023456
- Express the following numbers in scientific notation:  
 (a) 6548976 (b) 0.00000342 (c) 3456.986
- Give the answers to the correct number of significant figures:  
 (a)  $\frac{4.68 \times 456}{0.078} =$  (b)  $67.5 + 1.43 - 0.5247 =$   
 (c)  $(2.634 \times 10^2) + (234 \times 10^{-1}) =$   
 (d)  $\frac{6.98 \times 10^6 \times 3.453 \times 10^{-4}}{4.32 \times 10^{-8} \times 1.663 \times 10^5} =$
- Do the following conversions:  
 (a) 67 mg to g (b) 753 km to cm (c)  $3.45 \times 10^{-3}$  mm to m  
 (d)  $23 \text{ m}^3$  to  $\text{cm}^3$  (e)  $345 \text{ mm}^2$  to  $\text{km}^2$
- According to the Sporting News, the fastest recorded speed at which a baseball was thrown is 100.8 miles per hour. Calculate the speed in meters per second. 1 mile = 1.61 km.
- Aluminum has a density of  $2.70 \text{ g/cm}^3$ . Convert this to  $\text{lb/ft}^3$  using  $454 \text{ g} = 1 \text{ lb}$  and  $2.54 \text{ cm} = 1 \text{ inch}$ .
- The density of gasoline at  $20^\circ\text{C}$  is  $0.67 \text{ g/mL}$ . What is the volume of 23.5 g of gasoline at this temperature?
- The density of corn oil is  $0.90 \text{ g/mL}$ . What is the mass of 65.8 mL of corn oil?
- The density of bromine is to be calculated from the following experiment. A volumetric flask of capacity 50.0 mL and mass 27.6578 g was filled to the mark with bromine and reweighed. The mass of the filled flask was 174.0592 g.
- A container weighs 68.31 g empty, 93.34 g filled with water (density =  $0.9980 \text{ g/mL}$ ), and 88.42 g filled with an unknown liquid. Calculate the density of the unknown liquid.
- In the movie Raiders of the Lost Ark, Indiana Jones and an unscrupulous guide play catch with a gold idol. Assuming that the idol was solid gold and 1.00 L in size, what was the mass of the idol? Is playing catch with it plausible? (Density of gold =  $19.32 \text{ g/cm}^3$ )
- Do the following temperature conversions:  
 (a)  $365^\circ\text{F}$  to  $^\circ\text{C}$  (b)  $87^\circ\text{C}$  to  $^\circ\text{F}$  (c)  $14^\circ\text{F}$  to  $^\circ\text{C}$  (d)  $-28^\circ\text{C}$  to  $^\circ\text{F}$   
 (e)  $29^\circ\text{C}$  to K (f) 313 K to  $^\circ\text{F}$