Scroll Down for Ch. 2 Answer guide !

Conversions

1. Perform each conversion

a. 3.55 kg to grams

given!

* 100k at given for sig figs

don't forget units!

$$3.55\ \text{kg} \times \frac{1000\ \text{g}}{1\ \text{kg}} = 3550\ \text{g}$$

boo x your answer!

1 kg → 1000 g

b. 8944 in to meters

4 SF

in → cm → m

1 in = 2.54 cm

100 cm = 1 m

$$8944\ \text{in} \times \frac{2.54\ \text{cm}}{1\ \text{in}} \times \frac{1\ \text{m}}{100\ \text{cm}} = 227.1776\ \text{m}$$

227.2 m don't forget units!

c. 0.0187 L to milliliters

3 SF

1 L → 1000 mL

$$0.0187\ \text{L} \times \frac{1000\ \text{mL}}{1\ \text{L}} = 18.7\ \text{mL}$$

d. 4598 mg to kilograms

4 SF

1000 mg → 1 g ; 1000 g → 1 kg

$$4598\ \text{mg} \times \frac{1\ \text{g}}{1000\ \text{mg}} \times \frac{1\ \text{kg}}{1000\ \text{g}} = 0.004598\ \text{kg} \rightarrow 4.598 \times 10^{-3}\ \text{kg}$$

(both work)

e. 825 yd to kilometers 3SF yd → m → km

$$825\ \text{yd} \left| \frac{1\ \text{m}}{1.094\ \text{yd}} \right| \frac{1\ \text{km}}{1000\ \text{m}} = 0.7541133\ldots\ \text{km} \rightarrow 0.754\ \text{km}$$

2. The speed limit on many U.S. highways is 65 mi./hr. Convert this speed into km/day. 2SF

step 1 | step 2

$$65\ \text{mi} \left| \frac{1\ \text{km}}{0.6214\ \text{mi}} \right| \frac{24\ \text{hr}}{1\ \text{day}} = 2510.46\ \text{km/day} \rightarrow 2500\ \text{km/day} \quad 2.5 \times 10^3\ \text{km/day}$$

3. A prescription medication requires 7.55 mg per kg of body weight. Convert this quantity to the number of grams required per pound of body weight and determine the correct does (in g) for a 175-lb patient. 3SF

step 1 | step 2

$$7.55\ \text{mg} \left| \frac{1\ \text{g}}{1000\ \text{mg}} \right| \frac{1\ \text{kg}}{2.205\ \text{lb}} = 0.003424036281\ \text{g/lb}$$

$$\times\ 175\ \text{lb}$$

$$0.5994\ \text{g} \rightarrow 0.599\ \text{g}$$

① mg → g

② kg → lb

4. A house has an area of 215 m^2. What is its area in km^2? What about cm^2? 3SF

① do ② ax

$$215\ \text{m}^2 \left| \frac{1\ \text{km}}{1000\ \text{m}} \right| \frac{1\ \text{km}}{1000\ \text{m}} = 0.000215\ \text{km}^2 \rightarrow 2.15 \times 10^{-4}\ \text{km}^2$$

②

$$215\ \text{m}^2 \left| \frac{100\ \text{cm}}{1\ \text{m}} \right| \frac{100\ \text{cm}}{1\ \text{m}} = 2150000\ \text{cm}^2 \rightarrow 2.15 \times 10^6\ \text{cm}^2$$

Density

1. Label the density equation. Write out the possible equations.

1. Density = mass / volume

2. Mass = density × volume

3. Volume = mass / density

2. The gasoline in an automobile gas tank has a mass of 60.0 kg and a density of 0.752 g/ cm^3. What is its volume in cm^3.

3 SF

$V = \frac{m}{d}$ kg → g

$60.0\ kg \left| \frac{1000\ g}{1\ kg} \right. = 60{,}000\ g$

$\frac{60{,}000\ g}{0.752\ g/cm^3} =$

79787.23404 cm^3

$7.98 \times 10^4\ cm^3$ | 79800 cm^3

3. A steel cylinder has a volume of 246 cm^3 and a density of 7.93 g/cm^3. What is its mass in kilograms?

g → kg

$m = dV$

$246\ cm^3 * 7.93\ g/cm^3 = 1950.78\ g$

$1950.78\ g \left| \frac{1\ kg}{1000\ g} \right. = 1.95078\ kg$

1.95 kg

3 SF

4. Carbon dioxide gas has a density of 1.96 g/L at room temperature. How many grams are in 612.0 mL sample of CO_2?

4 SF

(1)

$612.0\ mL \left| \frac{1\ L}{1000\ mL} \right. = 0.6120\ L$

(2)

$m = dV$ $1.96\ g/L * 0.6120\ L = 1.19952\ g \rightarrow$

1.20 g