Page 43 #11abcd

2.9×10^{6}

5.87×10^{-1}

8.40×10^{-3}

5.5×10^{-6}

Page 43 #19abcd

$$\frac{28.0\ \text{cm}}{}\times\frac{10^{-2}\ \text{m}}{1\ \text{cm}}=2.80\times10^{-1}\ \text{m}=0.280\ \text{m}$$

$$\frac{1000.\ \text{m}}{}\times\frac{1\ \text{km}}{10^{3}\ \text{m}}=1000\times10^{-3}\ \text{km}=1.000\ \text{km}$$

$$\frac{9.28\ \text{cm}}{}\times\frac{10^{-2}\ \text{m}}{1\ \text{cm}}\times\frac{1\ \text{mm}}{10^{-3}\ \text{m}}=9.28\times10^{1}\ \text{mm}=92.8\ \text{mm}$$

$$\frac{10.68\ \text{g}}{}\times\frac{1\ \text{mg}}{10^{-3}\ \text{g}}=1.068\times10^{4}\ \text{mg}=10680\ \text{mg}$$

Page 43 #19efgh

$$\frac{6.8\times10^{4}\ mg}{}\times\frac{10^{-3}\ g}{1\ mg}\times\frac{1\ kg}{10^{3}\ g}=6.8\times10^{-2}\ kg\ =\ 0.068\ kg$$

$$\frac{8.54\ g}{}\times\frac{1\ kg}{10^{3}\ g}=8.54\times10^{-3}\ kg\ =\ 0.00854\ kg$$

$$\frac{25.0\ mL}{}\times\frac{10^{-3}\ L}{1\ mL}=25.0\times10^{-3}\ L\ =\ 0.0250\ L$$

$$\frac{22.4\ L}{}\times\frac{1\ \mu L}{10^{-6}\ \mathrm{L}}=22.4\times10^{6}\ \mu L\ =\ 2.24\times10^{7}\ \mu L$$

Page 43 #21

$$\frac{42.2\ \text{in}}{} \times \frac{2.54\ \text{cm}}{1\ \text{in}} = 107\ \text{cm}$$

$$\frac{0.64\ \text{m}}{} \times \frac{1\ \text{cm}}{10^{-2}\ \text{m}} \times \frac{1\ \text{in}}{2.54\ \text{cm}} = 25\ \text{in}$$

$$\frac{2.00\ \text{in}^2}{} \times \frac{2.54^2\ \text{cm}^2}{1^2\ \text{in}^2} = 12.9\ \text{cm}^2$$

$$\frac{42.8\ \text{kg}}{} \times \frac{2.20\ \text{lb}}{1\ \text{kg}} = 94.2\ \text{lb}$$

$$\frac{3.5\ \text{qt}}{} \times \frac{0.946\ \text{L}}{1\ \text{qt}} \times \frac{1\ \text{mL}}{10^{-3}\ \text{L}} = 3300\ \text{mL}$$

$$\frac{20.0\ \text{L}}{} \times \frac{1\ \text{gal}}{3.785\ \text{L}} = 5.28\ \text{gal}$$

Page 43 #23

$$\frac{15.2 \text{ miles}}{45 \text{ minutes}} \times \frac{60 \text{ minutes}}{1 \text{ hour}} \times \frac{1.609 \text{ km}}{1 \text{ mile}} = 33 \frac{\text{km}}{\text{hr}}$$

Page 43 #25

$$\frac{500.\ \text{mg cephalosporin}}{100\ \text{mL}} \times \frac{1\ \text{mL}}{10^{-3}\ \text{L}} \times \frac{10^{-3}\ \text{g}}{1\ \text{mg}} = 5\ \text{g}$$

Page 43 #27

$$\frac{1\ hr}{6.696\times10^{8}\ mi}\times\frac{1\ mi}{1.609\ km}\times\frac{60\ \text{min}}{1\ hr}\times\frac{5.78\times10^{7}\ km}{}=3.22\ \text{min}$$

Page 44 #29

$$\frac{11.2 \text{ lb of fat}}{100 \text{ lb body mass}} \times \frac{225 \text{ lb body mass}}{1} \times \frac{1 \text{ kg}}{2.2046 \text{ lb}} = 11.4 \text{ kg}$$

Page 44 #31

$$\frac{100.\ \text{yards}}{52\ \text{s}} \times \frac{60\ \text{s}}{1\ \text{minute}} \times \frac{3\ \text{ft}}{1\ \text{yd}} \times \frac{1\ \text{m}}{3.2808\ \text{ft}} = 105.5\ \frac{\text{m}}{\text{min}}$$

$$= 110\ \frac{\text{m}}{\text{min}}$$

Page 44 #33

$$\frac{\$2.50}{gal} \times \frac{1\ gal}{3.785\ \text{L}} \times \frac{1\ \text{L}}{11\ \text{km}} \times \frac{1.609\ \text{km}}{1\ \text{mi}} \times \frac{45.5\ \text{mi}}{} = \$4.40$$

Page 44 #35

$$\frac{21 \text{ lb California condor}}{} \times \frac{1 \text{ kg}}{2.2046 \text{ lb}} \times \frac{10^3 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ hummingbird}}{3.2 \text{ g}}$$

$$= 2976.75 = 3\bar{0}00 \text{ hummingbirds}$$

Page 44 #37

$$\frac{20.\ \text{drops}}{1.0\ \text{mL}} \times \frac{1\ \text{mL}}{10^{-3}\ \text{L}} \times \frac{3.785\ \text{L}}{1\ \text{gal}} = 76000\ \text{drops}$$

Page 44 #39

$$\frac{1\ \text{ft}^3}{} \times \frac{12^3\ \text{in}^3}{1^3\ \text{ft}^3} \times \frac{2.54^3\ \text{cm}^3}{1^3\ \text{in}^3} \times \frac{1\ \text{mL}}{1\ \text{cm}^3} = 28316.84659\ \text{mL}$$

Page 44 #41

$$V = (27)(21)(4.4) = 2500 \text{ cm}^3$$

$$2500 \text{ cm}^3 \times \frac{1 \text{ mL}}{1 \text{ cm}^3} \times \frac{1 \text{ L}}{10^3 \text{ mL}} = 2.5 \text{ L}$$

$$2500 \text{ cm}^3 \times \frac{1^3 \text{ in}^3}{2.54^3 \text{ cm}^3} = 150 \text{ in}^3$$

Page 44 #43

$$°F = 1.8°C + 32$$

$$°F = 1.8(38.8) + 32$$

$$°F = 70. + 32$$

$$°F = 102$$

Page 44 #47

$$°F = 1.8°C + 32$$

$$°F = 1.8(°F) + 32$$

$$-0.8°F = 32$$

$$\frac{-0.8°F}{-0.8} = \frac{32}{-0.8}$$

$$°F = -40$$

Page 44 #51

$$d = \frac{m}{V} = \frac{78.26}{50.00} = 1.565 \frac{g}{mL}$$

Page 44 #53

$$V = 29.6 - 25.0 = 4.6\ mL$$

$$d = \frac{m}{V} = \frac{32.7}{4.6} = 7.1 \frac{g}{mL}$$

Page 44 #55

$$d = \frac{m}{V}$$

$$m = dV$$

$$m = (1.19)(250.0) = 298 \text{ g}$$

Page 45 #60

$$d = \frac{m}{V}$$

$$V = \frac{m}{d} = \frac{25.27}{0.97} = 26\ mL$$

Page 45 #61

$$\frac{1032\ g}{1\ L} \times \frac{1\ L}{1000\ mL} = 1.032\ \frac{g}{mL}$$

$$\frac{1032\ g}{1\ L} \times \frac{1\ kg}{1000\ g} = 1.032\ \frac{kg}{L}$$

Page 45 #62

$$\frac{1.03\ g}{cm^3} \times \frac{1\ cm^3}{1\ mL} \times \frac{1\ mL}{10^{-3}\ L} \times \frac{1\ kg}{10^3\ g} \times \frac{2.2046\ lb}{1\ kg} \times \frac{3.1\ L}{} = 7.0\ lb$$

Page 45 #63

$$A = (2.5)(0.33) = 0.83\ ft^2$$

$$\frac{43\ \text{ft}^2}{1.0\ \text{qt}} \times \frac{4\ \text{qts}}{1\ \text{gal}} \times \frac{15\ \text{gal}}{1} \times \frac{1\ \text{dashed lane marker}}{0.83\ \text{ft}^2} = 3108.4\ \text{dashed lane markers}$$

$$= 3100\ \text{dashed lane markers}$$

Page 45 #65

$$\frac{180\ \mu g}{m^3} \times \frac{(10^{-1})^3\ m^3}{1\ dm^3} \times \frac{1\ dm^3}{1\ L} \times 2 \times 10^4\ L = 3600\ \mu g$$

Page 45 #67

$$\frac{130\ mg}{dL} \times \frac{1\ dL}{10^{-1}\ L} \times \frac{10^{-3}\ g}{1\ mg} \times 4.7\ L = 6.1\ g$$

Page 45 #69

$$\frac{14.2\ hands}{1} \times \frac{4\ inches}{1\ hand} \times \frac{1\ foot}{12\ inches} \times \frac{1\ meter}{3.2808\ feet} = 1.44\ m$$

Page 45 #70

$$\frac{22.5\ gal}{12\ h} \times \frac{3.785\ L}{1\ gal} \times \frac{24\ h}{1\ day} \times \frac{30.\ days}{1} = 5100\ L$$

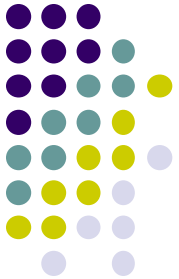
Page 45 #71

Of the three materials, magnesium has the smallest density and silver has the greatest. Since all have the same mass, the largest block (volume) is the material with the smallest density. Conversely, the smallest block (volume) has the largest density. This makes block A magnesium, block B aluminum, and block C is silver.

Page 45 #72

$$1.00\ \text{in}^3 \times \frac{2.54^3\ cm^3}{1\ in^3} = 16.4\ cm^3$$

Page 45 #73



For Aluminum:

$$d = \frac{m}{V}$$

$$2.70 = \frac{500.}{V}$$

$$V = 185 \text{ cm}^3$$

For Gold:

$$d = \frac{m}{V}$$

$$19.3 = \frac{m}{185}$$

$$m = 3570 \text{ g}$$

Page 45 #75

mass liquid = 150.50 - 88.25

mass liquid = 62.25 g

$$d = \frac{m}{V}$$

$$1.25 = \frac{62.25}{V}$$

$$V = \frac{62.25}{1.25} = 49.8 \text{ mL}$$

Page 45 #76

Ethyl alcohol's density is less than water. For constant mass, density and volume are inversely related. As a result, ethyl alcohol will occupy a greater volume.

Page 45 #77

$$8.1\text{ g} \times \frac{1\text{ oz}}{28.3\text{ g}} = 0.29\text{ oz}$$

$$3.5\% = 0.035$$

$$(0.035)(0.29) = 0.010\text{ oz Mn}$$

Page 45 #80

You should sketch a graph that has a negative slope. This is because the increase in temperature will cause an increase in volume. An **increase will volume will decrease density**, so the y-coordinates will get smaller as you move right along the x-axis (the x-coordinates get larger).

Page 45 #81

Note: the density of gold is 19.3 g/mL.

$$V = (2.00)(15.0)(6.00) = 180.\ \text{cm}^3$$

$$d = \frac{m}{V}$$

$$d = \frac{3300}{180.} = 18\ \frac{\text{g}}{\text{cm}^3}$$

The densities are unequal, so it is not gold. The dealer cheated you!

Page 45 #83

$$93.3\ \text{kg} \times \frac{1000\ \text{g}}{1\ \text{kg}} = 93\ 300\ \text{g}$$

$$d = \frac{m}{V}$$

$$19.3 = \frac{93\ 300}{V}$$

$$V = 4830\ \text{cm}^3$$

$$93.3\ \text{kg} \times \frac{2.2046\ \text{lb}}{1\ \text{kg}} \times \frac{14.58\ \text{troy oz}}{1\ \text{lb}} \times \frac{\$559}{1\ \text{troy oz}} = \$1\ 680\ 000$$

Page 45 #84

$$V_{object} = 57.5 - 50.0 = 7.5 \text{ mL}$$

$$d = \frac{m}{V} = \frac{20.25}{7.5} = 2.7 \ \frac{\text{g}}{\text{cm}^3}$$

The density of the metal is similar to aluminum, so the unknown must be aluminum.

Page 46 #85

volume solid = total volume – volume liquid

volume solid = 30.7 – 25.0 = 5.7 mL

$$d = \frac{m}{V} = \frac{15.454}{5.7} = 2.7\,\frac{\text{g}}{\text{mL}}$$

mass liquid = total mass – mass graduate – mass metal

mass liquid = 125.934 – 89.450 – 15.454 = 21.030 g

$$d = \frac{m}{V} = \frac{21.030}{25.0} = 0.841\,\frac{\text{g}}{\text{mL}}$$