

11.1.4 a) Volume b) Length c) Mass (weight)

11.1.12 a)  $7850 \text{ ft} \cdot \frac{1 \text{ mi}}{5280 \text{ ft}} \approx \boxed{1.487 \text{ mi}}$

$$\begin{array}{r} + 1.4867 \\ 528 \overline{) 785.0000} \\ \underline{2570} \\ 2112 \\ \underline{4580} \\ 4224 \\ \underline{3560} \\ 3168 \\ \underline{3920} \end{array}$$

d)  $9000 \text{ lb} \cdot \frac{1 \text{ ton}}{2000 \text{ lb}} = 4.5 \text{ ton}$

e)  $3.4 \text{ pt} \cdot \frac{2 \text{ c}}{1 \text{ pt}} = 6.8 \text{ pt}$

f)  $76 \text{ c} \cdot \frac{1 \text{ gal}}{16 \text{ c}} = 4.75 \text{ gal}$

$$\begin{array}{r} 4.75 \\ 16 \overline{) 76.00} \\ \underline{64} \\ 120 \\ \underline{112} \\ 80 \\ \underline{80} \\ 0 \end{array}$$

b)  $4.2 \text{ yd} \cdot \frac{3 \text{ ft}}{1 \text{ yd}} \cdot \frac{12 \text{ in.}}{1 \text{ ft}} = \boxed{331.2 \text{ in.}}$

$$\begin{array}{r} 11 \\ 27.6 \\ \times 12 \\ \hline 552 \\ 276 \\ \hline 331.2 \end{array}$$

c)  $5.6 \text{ lb} \cdot \frac{16 \text{ oz}}{1 \text{ lb}} = \boxed{89.6 \text{ oz}}$

11.1.14 a)  $0.2 \text{ m} \cdot \frac{100 \text{ cm}}{1 \text{ m}} = \boxed{20 \text{ cm}}$  b)  $0.001 \text{ km} \cdot \frac{1000 \text{ m}}{1 \text{ km}} \cdot \frac{1000 \text{ mm}}{1 \text{ m}} = \boxed{1000 \text{ mm}}$

c)  $0.05 \text{ kg} \cdot \frac{1000 \text{ g}}{1 \text{ kg}} = \boxed{50 \text{ g}}$  d)  $0.6 \text{ t} \cdot \frac{1000 \text{ kg}}{1 \text{ t}} \cdot \frac{1000 \text{ g}}{1 \text{ kg}} = \boxed{600,000 \text{ g}}$  e)  $0.0097 \text{ kL} \cdot \frac{1,000,000 \text{ mL}}{1 \text{ kL}} = \boxed{9700 \text{ mL}}$

f)  $8000 \text{ mL} \cdot \frac{1 \text{ L}}{1000 \text{ mL}} = \boxed{8 \text{ L}}$

11.1.16 a)  $0.2 \text{ km} \cdot \frac{0.62 \text{ mi}}{1 \text{ km}} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} \approx \boxed{654.72 \text{ ft}}$

$$\begin{array}{r} 12 \\ 0.124 \\ \times 5280 \\ \hline 10000 \\ 9920 \\ 24800 \\ 620000 \\ \hline 654720 \end{array}$$

b)  $15 \text{ in.} \cdot \frac{2.54 \text{ cm}}{1 \text{ in.}} \cdot \frac{10 \text{ mm}}{1 \text{ cm}} = \boxed{381 \text{ mm}}$

c)  $3.7 \text{ m} \cdot \frac{3.28 \text{ ft}}{1 \text{ m}} \cdot \frac{1 \text{ yd}}{3 \text{ ft}} \approx \boxed{4.05 \text{ yd}}$

$$\begin{array}{r} 3.7 \\ \times 3.28 \\ \hline 296 \\ 74 \\ 111 \\ \hline 12.136 \end{array}$$

d)  $80 \text{ oz} \cdot \frac{1 \text{ lb}}{16 \text{ oz}} \cdot \frac{0.45 \text{ kg}}{1 \text{ lb}} \approx \boxed{2.25 \text{ kg}}$

$\frac{11}{5} \text{ lb}$

e)  $490 \text{ kg} \cdot \frac{2.2 \text{ lb}}{1 \text{ kg}} \cdot \frac{1 \text{ ton}}{2000 \text{ lb}} \approx \boxed{0.539 \text{ ton}}$  f)  $52 \text{ c} \cdot \frac{1 \text{ gal}}{16 \text{ c}} \cdot \frac{3.78 \text{ L}}{1 \text{ gal}} \approx \boxed{12.32 \text{ L}}$

$$\begin{array}{r} 980 \\ 980 \\ \hline 1078.0 \end{array}$$

$$\begin{array}{r} 0.539 \\ 2000 \overline{) 1078.000} \\ \underline{10000} \\ 7800 \\ \underline{6000} \\ 18000 \\ \underline{18000} \\ 0 \end{array}$$

g)  $7 \text{ mL} \cdot \frac{1 \text{ L}}{1000 \text{ mL}} \cdot \frac{0.26 \text{ gal}}{1 \text{ L}} \cdot \frac{16 \text{ c}}{1 \text{ gal}} \cdot \frac{8 \text{ fl. oz}}{1 \text{ cup}} \approx \boxed{0.233 \text{ fl. oz}}$

h)  $1.5 \text{ kL} \cdot \frac{1000 \text{ L}}{1 \text{ kL}} \cdot \frac{0.26 \text{ gal}}{1 \text{ L}} \cdot \frac{4 \text{ qt}}{1 \text{ gal}} = \boxed{1560 \text{ qt}}$

11.1.18 a)  $3 \text{ yd} > 2 \text{ m} \approx 2 \text{ m} \cdot \frac{3.28 \text{ yd}}{3 \text{ m}} \approx 2.186 \text{ yd}$  b)  $22 \text{ mL} < 3 \text{ c}$

c)  $2 \text{ t} = 2000 \text{ kg} \approx 4400 \text{ lb} < 4500 \text{ lb}$

d)  $2 \text{ ft} \approx 60 \text{ cm} > 40 \text{ cm}$

e)  $65 \text{ fl. oz} \approx 2 \text{ qt} \approx 2 \text{ L} > 1 \text{ L}$

f)  $1 \text{ ton} = 2000 \text{ lb} < 2200 \text{ lb} \approx 1000 \text{ kg} = 1 \text{ t}$

11.1.20] a) mi, km. b) c, mL c) g, oz.

In all cases, we want an answer that is neither very large or very small.

11.1.21] a) ~~1000 mL~~

$$\frac{1000 \text{ mL}}{1 \text{ L}} = \frac{x \text{ mL}}{33 \text{ L}}, \text{ so } \boxed{x = 33,000 \text{ mL}}$$

b)  $\frac{1 \text{ kL}}{1000 \text{ L}} = \frac{x \text{ kL}}{33 \text{ L}}, \text{ so } \boxed{x = 0.033 \text{ kL}}$

11.1.30]

Convert gallons to cups:

$\frac{3}{4}$  gal of milk.  $\frac{16 \text{ c}}{1 \text{ gal}} = 12 \text{ c of milk.}$  Each batch uses  $\frac{1}{4}$  cup, so we can make  $\frac{12 \text{ c}}{1/4 \text{ c}} = \boxed{48 \text{ batches}}$

11.1.34] A 30% empty 605 pt bottle contains  $(1-0.3) \cdot 605 \text{ pt} = 0.735 \text{ pt}$  of water.

$$0.735 \text{ pt} \cdot \frac{1 \text{ gal}}{8 \text{ pt}} \cdot \frac{3.79 \text{ L}}{1 \text{ gal}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}} \approx \boxed{348 \text{ mL}}$$

11.1.42]

$$\$25 \cdot \frac{1 \text{ yen}}{1001} = 2500 \text{ yen}, \quad \$25 \cdot \frac{1 \text{ £}}{1.52} = \text{£}16.45, \quad \$25 \cdot \frac{1 \text{ €}}{1.30} = \text{€}19.23$$

11.1.44] Use the fact that distance = rate  $\cdot$  time.

a)  $24 \text{ s} \cdot \frac{340 \text{ m}}{1 \text{ s}} \cdot \frac{1 \text{ km}}{1000 \text{ m}} = \boxed{8.16 \text{ km}}$

b)  $1 \text{ mi} \cdot \frac{1.61 \text{ km}}{1 \text{ mi}} \cdot \frac{1000 \text{ m}}{1 \text{ km}} \cdot \frac{1 \text{ s}}{340 \text{ m}} \approx \boxed{4.74 \text{ s}}$