CHAPTER 1

Numbers underlined are answers not found in the Text or Study Guide

1-1 (c) 74.224 gal (It has the most significant figures.)

1-2   If a device used to produce a measurement is itself inaccurate, the measurement may be reproducible (precise) but not accurate. Examples are a ruler with the tip broken off or a weight scale with some dirt on it.

1-3 (d) 26.984 in. is the most precise but (a) 26.7 in. is the most accurate.

1-4 (a) three (b) two (c) three (d) one (e) four (f) two   g) two (h) three

1-5 (a) two (b) four (c) three (d) three (e) four (f) five (g) two (h) one

1-6 (a) ±10 (b) ±0.1 (c) ±0.01 (d) ±0.01 (e) ±1 (f) ±0.001 (g) ±100
(h) ±0.00001

1-7 (a) ±0.01 (b) ±0.1 (c) ±0.001 (d) ±0.1 (e) ±0.001 (f) ±0.0001 (g) ±0.0001
(h) ±100

1-8 (a) 16.0 (b) 1.01 (c) 0.665 (d) 4890 (e) 87,600 (f) 0.0272 (g) 301

1-9 (a) 1200 (b) 28 (c) 38000 (d) 0.47 (e) 55 (f) 0.040 (g) 1,600,000 (h) 320

1-10 (a) 0.250 (b) 0.800 (c) 1.67 (d) 1.17

1-11 (a) 0.667 (b) 0.400 (c) 0.625 (d) 3.25

1-12 (a) ±0.1 (b) ±1000 (c) ±1 (d) ±0.01

1-13 (a) ±10 (b) ±0.001 (c) ±10 (d) ±1

1-14 (a) 198 (b) 12.90 (c) 2300 (d) 48 (e) 0.90

1-15 (a) 0.77 (b) 13.0 (c) 32 (d) 326

1-16 37.9 qt

1-17 3810 lb

1-18   (a) 8.0   (b) 137   (c) 192   (d) 0.445   (e) 3.20   (f) 3.9

_1-19_ (a) 0.048   (b) 0.17   (c) 1.0   (d) 2.180   (e) 2.5   (f) 0.12

1-20   (a) two   (b) three   (c) two   (d) one

_1-21_ (a) one   (b) three   (c) three   (d) two

_1-22_ (a) 6.07   (b) 6.049   (c) 8.62   (d) 8   (e) 3.98   (f) 3.973   (g) 0.5098

1-23   (a) 6.07   (b) 0.08   (c) 8.624   (d) 24   (e) 0.220   (f) 0.52

_1-24_ (a) 150 cm^2 (b) 394 ft^2 (c) 2 cm   (d) 2.3 in.

_1-25_ (a) 5000 m   (b) 1700 ft^2 (c) 1.21 in.^{2} (d) 100 yd (one significant figure)

1-26   (a) (63) + 75.0 = $\underline{138}$ (b) (45) x 25.6 = $\underline{1200}$ (c) (2.7) x (10.52) = $\underline{28}$

_1-27_   (a) (30) - 23.456 = $\underline{7}$ (b) (14.45) x 0.876 = $\underline{12.7}$ (c) (1.06) + (0.425) = $\underline{1.49}$

1-28 (14.5 – 11.7)/14.5 x 100% = $\underline{19\%}$

_1-29_   (373 – 371)/373 x 100% = $\underline{0.5\%}$

1-30 (29035 – 29002)/29035 x 100% = $\underline{0.11\%}$

_1-31_   1/55 x 100% = $\underline{2\%}$ (tower)   1/150 x100% = $\underline{0.7\%}$ (cities)

1-32   (a) 1.257 x 10^3 (b) 1.57 x 10^{-1} (c) 3.00 x 10^{-2} (d) 4.0 x 10^7 (e) 3.49 x 10^{-2}
(f) 3.2 x 10^4 (g) 3.2 x 10^{10} (h) 7.71 x 10^{-4} (i) 2.34 x 10^3

_1-33_   (a) 4.23 x 10^5 (b) 4.338 x 10^2 (c) 2.0 x 10^{-2} (d) 8.8 x 10^2 (e) 8 x 10^{-5}
(f) 8.20 x 10^7 (g) 7.5 x 10^{13} (h) 1.06 x 10^{-6}

1-34 (a) 9 x 10^4 (b) 8.7 x 10^4 (c) 8.70 x 10^4

_1-35_ (a) 2 x 10^4 (b) 2.4 x 10^4 (c) 2.36 x 10^4 (d) 2.360 x 10^4

1-36 (a) 0.00476   (b) 6550   (c) 0.00788   (d) 48,900   (e) 4.75   (f) 0.0000034

_1-37_ (a) 0.064   (b) 8340   (c) 220   (d) 0.00342

1-38   (a) 4.89 x 10^{-4} (b) 4.56 x 10^{-5} (c) 7.8 x 10^3 (d) 5.71 x 10^{-2}
(e) 4.975 x 10^8 (f) 3.0 x 10^{-4}

1-39 (a) 7.8×10^{-9} (b) 7.2×10^{-1} (c) 3.45×10^{19}
(d) 2.800×10^{10} (e) 6.90×10^{-14} (f) 2.3×10^3

1-40 (b) < (f) < (g) < (d) < (a) < (e) < (c)

1-41 (g) < (c) < (f) < (a) < (e) < (b) < (d)

1-42 (a) 1.597×10^{-3} (b) 2.30×10^7 (c) 3.5×10^{-5} (d) 2.0×10^{14}

1-43 (a) 1.58×10^{-10} (b) 2.29×10^{10} (c) 3.691×10^{-6} (d) 3.15×10^{12}

1-44 (a) 10^8 (b) $10^0 = 1$ (c) 10^{29} (d) 10^9

1-45 (a) 10^{15} (b) 10^{-7} (c) 1 (d) 10^{-7}

1-46 (a) 3.1×10^{10} (b) 2×10^9 (c) 4×10^{13} (d) 14 (e) 2.56×10^{-14}

1-47 (a) 6×10^{16} (b) 5×10^{-9} (c) 1.7×10^{-14} (d) 1.26×10^{12} (e) 5.095×10^{12}

1-48 (a) 2.0×10^{12} (b) 3.7×10^{16} (c) 6.0×10^2 (d) 2×10^{-12} (e) 1.9×10^8

1-49 (a) 1.225×10^7 (b) 9.00×10^{-12} (c) 3.0×10^{-24} (d) 9×10^4 (e) 1×10^{10}

1-50 (a) 1.8×10^{19} (b) 4×10^4 (c) 2.07×10^{12} (d) 9.0×10^3

1-51 (a) microliter (μL) (b) hectogram (hg) (c) nanojoule (nJ)
(d) centimeter (cm) (e) milligram (mg) (f) decipascal (dPa)

1-52 (a) millimeter (mm) (b) kilogram (kg) (c) milliliter (mL) (d) kilosecond (ks)
(e) nanometer (nm) (f) millimole (mmol)

1-53 (a) 72 cm, 0.72 m, 7.2×10^{-2} km
(b) 5.64×10^4 mm, 5640 cm, 0.0564 km
(c) 2.50×10^5 mm, 2.50×10^4 cm, 250 m

1-54 (a) 8.9 g, 8.9×10^{-3} kg (b) 2.57×10^4 mg, 0.0257 kg
(c) 1.25×10^6 mg, 1250 g

1-55 (a) 1.8×10^6 mL, 1.8×10^3 L (b) 786 mL, 7.86×10^{-4} kL
(c) 4.452 L, 4.452×10^{-3} kL

1-56 (a) 12 = 1 doz (c) 3 ft = 1 yd (e) 10^3 m = 1 km

1-57 (a) infinite (exact number)   (b) infinite   (c) three   (d) four   (e) two   (f) infinite

1-58 (a) $\dfrac{1 \text{ g}}{10^3 \text{ mg}}$ (b) $\dfrac{1 \text{ km}}{10^3 \text{ m}}$ (c) $\dfrac{1 \text{ L}}{100 \text{ cL}}$ (d) $\dfrac{1 \text{ m}}{10^3 \text{ mm}}$, $\dfrac{1 \text{ km}}{10^3 \text{ m}}$

1-59 (a) $\dfrac{10^3 \text{ L}}{\text{kL}}$ (b) $\dfrac{10^6 \text{ g}}{\text{Mg}}$ (c) $\dfrac{10^3 \text{ g}}{\text{kg}}$, $\dfrac{1 \text{ Mg}}{10^6 \text{ g}}$ (d) $\dfrac{\text{g}}{10^2 \text{ cg}}$, $\dfrac{\text{hg}}{10^2 \text{ g}}$

1-60 (a) $\dfrac{1 \text{ ft}}{12 \text{ in.}}$ (b) $\dfrac{2.54 \text{ cm}}{\text{in.}}$ (c) $\dfrac{5280 \text{ ft}}{\text{mi}}$ (d) $\dfrac{1.057 \text{ qt}}{\text{L}}$ (e) $\dfrac{1 \text{ qt}}{2 \text{ pt}}$ $\dfrac{1 \text{ L}}{1.057 \text{ qt}}$

1-61 (a) $\dfrac{1 \text{ gal}}{4 \text{ qt}}$ (b) $\dfrac{2.205 \text{ lb}}{\text{kg}}$ (c) $\dfrac{3.785 \text{ L}}{\text{gal}}$ (d) $\dfrac{1 \text{ mi}}{5280 \text{ ft}}$, $\dfrac{1.609 \text{ km}}{\text{mi}}$

1-62 (a) 17 L   (b) 28 cm   (c) 18.1 mi   (d) 51.56 yd   (e) 22 m   (f) 10.27 bbl   (g) 32 Gg

1-63 (a) 3.0 ton   (b) 4.3 yd   (c) 8.22 km   (d) 65.2 mL   (e) 49 km   (f) 31.5 gal   (g) 1.5 µg

1-64   (a) $1.8 \times 10^3 \text{ m} \times \dfrac{1 \text{ km}}{10^3 \text{ m}} = \underline{1.8 \text{ km}}$ $1.8 \text{ km} \times \dfrac{1 \text{ mi}}{1.609 \text{ km}} = \underline{1.1 \text{ mi}}$

$1.1 \text{ mi} \times \dfrac{5280 \text{ ft}}{\text{mi}} = \underline{5.8 \times 10^3 \text{ ft}}$

(b) $0.450 \text{ mi} \times \dfrac{5280 \text{ ft}}{\text{mi}} = \underline{2380 \text{ ft}}$ $0.450 \text{ mi} \times \dfrac{1.609 \text{ km}}{\text{mi}} = \underline{0.724 \text{ km}}$

$0.724 \text{ km} \times \dfrac{10^3 \text{ m}}{\text{km}} = \underline{724 \text{ m}}$

(c) $8.98 \times 10^3 \text{ ft} \times \dfrac{1 \text{ mi}}{5280 \text{ ft}} = \underline{1.70 \text{ mi}}$ $1.70 \text{ mi} \times \dfrac{1.609 \text{ km}}{\text{mi}} = \underline{2.74 \text{ km}}$

$2.74 \text{ km} \times \dfrac{10^3 \text{ m}}{\text{km}} = \underline{2740 \text{ m}}$

(d) $6.78 \text{ km} \times \dfrac{1 \text{ mi}}{1.609 \text{ km}} = \underline{4.21 \text{ mi}}$ $4.21 \text{ mi} \times \dfrac{5280 \text{ ft}}{\text{mi}} = \underline{2.22 \times 10^4 \text{ ft}}$

$6.78 \text{ km} \times \dfrac{10^3 \text{ m}}{\text{km}} = \underline{6780 \text{ m}}$

1-65   (a) $2.78 \text{ gal} \times \dfrac{3.785 \text{ L}}{\text{gal}} = \underline{10.5 \text{ L}}$ $10.5 \text{ L} \times \dfrac{1.057 \text{ qt}}{\text{L}} = \underline{11.1 \text{ qt}}$

(b) $670 \text{ qt} \times \dfrac{1 \text{ L}}{1.057 \text{ qt}} = \underline{630 \text{ L}}$ $670 \text{ qt} \times \dfrac{1 \text{ gal}}{4 \text{ qt}} = \underline{170 \text{ gal}}$

(c) 7.68×10^3 L x $\dfrac{1.057 \text{ qt}}{\text{L}}$ = $\underline{8.12 \times 10^3}$ qt 8.12×10^3 qt x $\dfrac{1 \text{ gal}}{4 \text{ qt}}$ = $\underline{2.03 \times 10^3}$ gal

1-66 (a) 0.780 kg x $\dfrac{10^3 \text{ g}}{\text{kg}}$ = $\underline{780 \text{ g}}$ 0.780 kg x $\dfrac{2.205 \text{ lb}}{\text{kg}}$ = $\underline{1.72 \text{ lb}}$

(b) 985 g x $\dfrac{1 \text{ kg}}{453.6 \text{ g}}$ = $\underline{2.17 \text{ lg}}$ 985 g x $\dfrac{1 \text{ kg}}{10^3 \text{ g}}$ = $\underline{0.985 \text{ kg}}$

(c) 16.0 lb x $\dfrac{453.6 \text{ g}}{\text{lb}}$ = $\underline{7.26 \times 10^3}$ g 7.26×10^3 g x $\dfrac{1 \text{ kg}}{10^3 \text{ g}}$ = $\underline{7.26 \text{ kg}}$

1-67 152 lb x $\dfrac{453.6 \text{ g}}{\text{lb}}$ x $\dfrac{1 \text{ kg}}{10^3 \text{ g}}$ = $\underline{68.9 \text{ kg}}$

1-68 238,700 mi x $\dfrac{1.609 \text{ km}}{\text{mi}}$ = 384,068 km = 3.841×10^5 km

1-69 28.0 m x $\dfrac{10^2 \text{ cm}}{\text{m}}$ x $\dfrac{1 \text{ in.}}{2.54 \text{ cm}}$ x $\dfrac{1 \text{ ft}}{12 \text{ in.}}$ x $\dfrac{1 \text{ yd}}{3 \text{ ft}}$ = $\underline{30.6 \text{ yd}}$ (New punter is needed.)

1-70 355 mL x $\dfrac{1 \text{ L}}{10^3 \text{ mL}}$ x $\dfrac{1.057 \text{ qt}}{\text{L}}$ = $\underline{0.375 \text{ qt}}$

1-71 0.375 qt x $\dfrac{1 \text{ L}}{1.057 \text{ qt}}$ = $\underline{0.355 \text{ L}}$

1-72 4.00 oz x $\dfrac{1 \text{ lb}}{16 \text{ oz}}$ x $\dfrac{453.6 \text{ g}}{\text{lb}}$ = $\underline{113 \text{ g}}$

1-73   6 ft 10 1/2 in. = 82.5 in.   82.5 in. x $\dfrac{2.54 \text{ cm}}{\text{in.}}$ x $\dfrac{1 \text{ m}}{10^2 \text{ cm}}$ = $\underline{2.10 \text{ m}}$

212 lb x $\dfrac{1 \text{ kg}}{2.205 \text{ lb}}$ = $\underline{96.1 \text{ kg}}$

1-74 60.0 L x $\dfrac{1.057 \text{ qt}}{\text{L}}$ x $\dfrac{1 \text{ gal}}{4 \text{ qt}}$ = $\underline{15.9 \text{ gal}}$

1-75 100 m x $\dfrac{10^2 \text{ cm}}{\text{m}}$ x $\dfrac{1 \text{ in.}}{2.54 \text{ cm}}$ x $\dfrac{1 \text{ ft}}{12 \text{ in.}}$ x $\dfrac{1 \text{ yd}}{3 \text{ ft}}$ = $\underline{109 \text{ yd}}$
[A first and ten (meters) is the same as first and 10.9 yds.]

1-76 0.200 gal x $\dfrac{4 \text{ qt}}{\text{gal}}$ = 0.800 qt   0.800 qt x $\dfrac{1 \text{ L}}{1.057 \text{ qt}}$ x $\dfrac{1 \text{ mL}}{10^{-3} \text{ L}}$ = $\underline{757 \text{ mL}}$

There is slightly more in a "fifth" than in 750 mL.

1-77 385 yd x $\dfrac{1 \text{ mi}}{1760 \text{ yd}}$ = 0.219 mi   26.219 mi x $\dfrac{1.609 \text{ km}}{\text{mi}}$ = 42.2 km

1-78 55 mi/hr x $\dfrac{1.609 \text{ km}}{\text{mi}}$ = 88 km/hr

1-79 29,028 ft x $\dfrac{1 \text{ mi}}{5280 \text{ ft}}$ x $\dfrac{1.609 \text{ km}}{\text{mi}}$ = 8.846 km

1-80   262 mi x $\dfrac{1.609 \text{ km}}{\text{mi}}$ = 422 km

1-81 12.0 in. x $\dfrac{2.54 \text{ cm}}{\text{in}}$ x $\dfrac{10 \text{ mm}}{\text{cm}}$ = 305 mm

1-82 $\dfrac{\$0.899}{\text{gal}}$ x $\dfrac{1 \text{ gal}}{4 \text{ qt}}$ x $\dfrac{1.057 \text{ qt}}{\text{L}}$ = \$0.238/L

   80.0 L x $\dfrac{\$0.238}{\text{L}}$ = \$19.04

   80.0 L x $\dfrac{1 \text{ gal}}{3.785 \text{ L}}$ x $\dfrac{\$2.759}{\text{gal}}$ = \$58.31

1-83   551 mi x $\dfrac{1 \text{ gal}}{21.0 \text{ mi}}$ x $\dfrac{\$2.759}{\text{gal}}$ = \$72.39

   482 km x $\dfrac{1 \text{ mi}}{1.609 \text{ km}}$ x $\dfrac{1 \text{ gal}}{21.0 \text{ mi}}$ x $\dfrac{\$2.759}{\text{gal}}$ = \$39.36

1-84 \$75.00 x $\dfrac{1 \text{ gal}}{\$2.759}$ x $\dfrac{21.0 \text{ mi}}{\text{gal}}$ x $\dfrac{1.609 \text{ km}}{\text{mi}}$ = 919 km

1-85 250 asp x $\dfrac{0.324 \text{ g}}{\text{asp}}$ x $\dfrac{1 \text{ lb}}{453.6 \text{ g}}$ = 0.179 lb

1-86 \$4.55 (Can) x $\dfrac{\$1 \text{ (US)}}{\$1.56 \text{ (Can)}}$ = \$2.92 (US)

1-87 \$3.50 x $\dfrac{1 \text{ lb}}{\$0.95}$ x $\dfrac{145 \text{ nails}}{\text{lb}}$ = 534 nails

1-88 5670 nails x $\dfrac{1 \text{ lb}}{185 \text{ nails}}$ x $\dfrac{\$0.92}{\text{lb}}$ = \$28.20

1-89 858 km x $\dfrac{1 \text{ mi}}{1.609 \text{ km}}$ x $\dfrac{1 \text{ gal}}{38.5 \text{ mi}}$ x $\dfrac{\$2.759}{\text{gal}}$ = $\underline{\$38.21}$

858 km x $\dfrac{1 \text{ mi}}{1.609 \text{ km}}$ x $\dfrac{1 \text{ gal}}{18.5 \text{ mi}}$ x $\dfrac{\$2.759}{\text{gal}}$ = $\underline{\$79.53}$

_1-90_ 57,000 ft x $\dfrac{1 \text{ mi}}{5280 \text{ ft}}$ x $\dfrac{1 \text{ hr}}{85 \text{ mi}}$ = $\underline{0.127 \text{ hr}}$

37 min x $\dfrac{1 \text{ hr}}{60 \text{ min}}$ x $\dfrac{85 \text{ mi}}{\text{hr}}$ x $\dfrac{1760 \text{ yd}}{\text{mi}}$ = $\underline{9.2 \times 10^4 \text{ yd}}$

_1-91_ \$8.15 x $\dfrac{1 \text{ lb}}{\$2.15}$ x $\dfrac{255 \text{ grapes}}{\text{lb}}$ = $\underline{967 \text{ grapes}}$

1-92 442 mi x $\dfrac{1.609 \text{ km}}{\text{mi}}$ x $\dfrac{1\text{hr}}{215 \text{ km}}$ = $\underline{3.31 \text{ hr}}$

1-93 (a) \$6.50 x $\dfrac{1.12 \text{ euro}}{\$}$ = $\underline{\$7.28}$ (b) 12.65 euro x $\dfrac{\$1.12}{\text{euro}}$ = $\underline{\$11.29}$

(c) 15.58 euro x $\dfrac{\$1.27}{\text{euro}}$ = $\underline{\$19.79}$

1-94 $\dfrac{0.649 \text{ pd}}{\$}$ x $\dfrac{\$1.27}{\text{euro}}$ = $\dfrac{0..824 \text{ pd}}{\text{euro}}$ 25,600 euro x $\dfrac{0..824 \text{ pd}}{\text{euro}}$ = $\underline{21,100 \text{ pd}}$

_1-95_ 35.00 peso x $\dfrac{1 \text{ \$}}{13.51 \text{ peso}}$ = $\underline{\$2.59}$

\$2.59 x $\dfrac{1 \text{ euro}}{\$1.27}$ = $\underline{2.04 \text{ euro}}$ \$2.59 x $\dfrac{0.649 \text{ pd}}{\$}$ = $\underline{1.68 \text{ pd}}$

_1-96_ $\dfrac{35 \text{ mi}}{\text{hr}}$ x $\dfrac{5280 \text{ ft}}{\text{mi}}$ x $\dfrac{12 \text{ in.}}{\text{ft}}$ x $\dfrac{2.54 \text{ cm}}{\text{in.}}$ x $\dfrac{1 \text{ hr}}{60 \text{ min}}$ x $\dfrac{1 \text{ min}}{60 \text{ s}}$ = $\underline{1600 \text{ cm/s}}$

1-97 4.0×10^8 mi x $\dfrac{5280 \text{ ft}}{\text{mi}}$ x $\dfrac{l2 \text{ in.}}{\text{ft}}$ x $\dfrac{2.54 \text{ cm}}{\text{in.}}$ x $\dfrac{1 \text{ s}}{3.0 \times 10^{10} \text{ cm}}$ x 1min/60s= $\underline{36 \text{ min}}$

2100 s x $\dfrac{1 \text{ min}}{60 \text{ s}}$ x $\dfrac{1 \text{ hr}}{60 \text{ min}}$ = $\underline{0.58 \text{ hr}}$

1-98 $T(^{o}F) = 1.8(300^{o}C) + 32 = 520 + 32 = 572^{o}F$

1-99 $T(^{o}C) = (73-32)/1.8 = 41/1.8 = 23^{o}C$

1-100 $T(^oF) = 1.8(-273) + 32 = -459^oF$

1-101 $T(^oF) = [(-39) \times 1.8] + 32 = -38^oF$

1-102 $T(^oC) = \dfrac{(-110 - 32)}{1.8} = -79^oC$

1-103 $T(^oF) = [(33.0 \times 1.8) + 32.0] = 91.4^oF$

1-104 (a) -78^oC (b) 22^oC (c) 27^oC (d) -48^oC (e) 600^oC

1-105 (a) 320 K (b) 298 K (c) 200 K (d) 261 K (e) 291 K (f) 244 K

1-106 (a) 310 K (b) 408 K (c) -68^oC (d) -231^oF (e) 311 K (f) 248 K

1-107 Since $T(^oC) = T(^oF)$ substitute $T(^oC)$ for $T(^oF)$ and set the two equations equal.

$[T(^oC) \times 1.8] + 32 = \dfrac{T(^oC) - 32}{1.8}$ $(1.8)^2 T(^oC) - T(^oC) = -32 - 32(1.8)$ $T(^oC) = -40^oC$

1-108 (a) 3×10^2 (b) $8.26 \text{ g} \cdot \text{cm}$ (c) 5.24 g/mL (d) 19.1

1-109 (a) $\dfrac{1 g}{10^3 \text{ mg}}$, $\dfrac{1 \text{ lb}}{453.6 \text{ g}}$ (b) $\dfrac{1.057 \text{ qt}}{L}$, $\dfrac{2 \text{ pt}}{\text{qt}}$

(c) $\dfrac{1 \text{ km}}{10 \text{ hm}}$, $\dfrac{1 \text{ mi}}{1.609 \text{ km}}$ (d) $\dfrac{1 \text{ in.}}{2.54 \text{ cm}}$, $\dfrac{1 \text{ ft}}{12 \text{ in.}}$

1-110 $5.34 \times 10^{11} \text{ ng} \times \dfrac{10^{-9} \text{ g}}{\text{ng}} \times \dfrac{1 \text{ lb}}{453.6 \text{ g}} = 1.18 \underline{\text{ lb}}$

1-111 $7.88 \times 10^{-5} \text{ ML} \times \dfrac{10^6 \text{ L}}{\text{ML}} \times \dfrac{1 \text{ gal}}{3.785 \text{ L}} = \underline{20.8 \text{ gal}}$

1-112 $1.00 \text{ kg} \times \dfrac{10^3 \text{ g}}{\text{kg}} \times \dfrac{1 \text{ tr lb}}{373 \text{ g}} \times \dfrac{12 \text{ oz}}{\text{tr lb}} \times \dfrac{\$1249}{\text{oz}} = \underline{\$40,182}$

1-113 $\dfrac{247 \text{ lb}}{82.3 \text{ doz}} = \underline{3.00 \text{ lb/doz}}$ $\dfrac{82.3 \text{ doz}}{247 \text{ lb}} = \underline{0.333 \text{ doz/lb}}$

1-114 $12.0 \text{ fur} \times \dfrac{1 \text{ mi}}{8 \text{ fur}} \times \dfrac{5280 \text{ ft}}{\text{mi}} \times \dfrac{12 \text{ in.}}{\text{ft}} \times \dfrac{1 \text{ hand}}{4 \text{ in.}} = \underline{2.38 \times 10^4} \text{ hands}$

1-115 $\$1.45/16 \text{ oz} = \$0.091/\text{oz}$ $\$2.00/26 \text{ oz} = \$0.077/\text{oz}$ <u>(The 26 ounce can is cheaper.)</u>

1-116 $1.00 \text{ lb} \times \dfrac{453.6 \text{ g}}{\text{lb}} \times \dfrac{10^3 \text{ mg}}{\text{g}} \times \dfrac{1 \text{ cig.}}{11.0 \text{ mg}} \times \dfrac{1 \text{ pkg}}{20 \text{ cig.}} = 2060 \underline{\text{ pkgs}}$

$2060 \text{ pkgs} \times \dfrac{1 \text{ day}}{2 \text{ pkg}} \times \dfrac{1 \text{ yr}}{365 \text{ day}} = 2.82 \underline{\text{ years}}$

1-117 $1 \text{ in.} = 2.54 \text{ cm} \qquad 1 \text{ in.}^3 = 16.4 \text{ cm}^3 = 16.4 \text{ mL}$

$250 \text{ in.}^3 \times \dfrac{16.4 \text{ mL}}{\text{in.}^3} \times \dfrac{1 \text{ L}}{10^3 \text{ mL}} = \underline{4.1 \text{ L}}$

1-118 $1.00 \text{ lb} \times \dfrac{453.6 \text{ g}}{\text{lb}} \times \dfrac{1 \text{ quarter}}{5.70 \text{ g}} \times \dfrac{\$1}{4 \text{ quarters}} = \underline{\$19.89}$

(Actually, the answer is $19.75 since you probably would not have part of one quarter.)

1-119 $5.4 \times 10^7 \, ^\circ\text{F} \qquad 3.0 \times 10^7 \, ^\circ\text{C} + 273 = 3.0 \times 10^7 \text{ K}$

1-120 $\dfrac{30.0 \text{ Hil}}{\text{L}} \times \dfrac{1 \text{ Ryl}}{100 \text{ Hil}} \times \dfrac{\$0.250}{\text{Ryl}} \times \dfrac{3.785 \text{ L}}{\text{gal}} = \underline{\$0.284/\text{gal}}$

1-121 $1 \text{ ft} \times 30.0 \text{ ft} \times 50.0 \text{ ft} = 1500 \text{ ft}^3 \qquad 1500 \text{ ft}^3 \text{ snow} \times \dfrac{0.100 \text{ ft}^3 \text{ water}}{\text{ft}^3 \text{ snow}} = 150 \text{ ft}^3 \text{ water}$

$150 \text{ ft}^3 \times \dfrac{62.0 \text{ lb}}{\text{ft}^3} = \underline{9300 \text{ lb}} \qquad 9300 \text{ lb} \times \dfrac{1 \text{ ton}}{2000 \text{ lb}} = \underline{4.65 \text{ ton}}$