

Dimensional Analysis Key (Factor Label Method)

$$1. \frac{3 \text{ hr}}{1} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{60 \text{ sec}}{1 \text{ min}} = 10800 \text{ sec.}$$

$$2. \frac{0.035 \text{ mg}}{1} \times \frac{1 \text{ cg}}{10 \text{ mg}} = \frac{.035 \text{ cg}}{10} = .0035 \text{ cg}$$

$$3. \frac{5.5 \text{ kg}}{1} \times \frac{2.2 \text{ lb}}{1 \text{ kg}} = 12.1 \text{ lb.}$$

$$4. \frac{2.5 \text{ yd}}{1} \times \frac{36 \text{ in}}{1 \text{ yd}} = 90 \text{ in.}$$

$$5. \frac{1.3 \text{ yr}}{1} \times \frac{365 \text{ day}}{1 \text{ yr}} \times \frac{24 \text{ hr}}{1 \text{ day}} = 11388 \text{ hr.}$$

$$6. \frac{3 \text{ moles}}{1} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mole}} = 18.06 \times 10^{23} \text{ molecules} = 1.806 \times 10^{24} \text{ molecules}$$

$$7. \frac{2.5 \times 10^{24} \text{ molecules}}{1} \times \frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ molecules}} = \frac{2.5 \times 10^{24} \text{ moles}}{6.02 \times 10^{23}} = .415 \times 10^1 = 4.15$$

$$8. \frac{5 \text{ moles}}{1} \times \frac{22.4 \text{ L}}{1 \text{ mole}} = 112 \text{ L}$$

$$9. \frac{100 \text{ L}}{1} \times \frac{1 \text{ mole}}{22.4 \text{ L}} = \frac{100 \text{ mole}}{22.4} = 4.464 \text{ moles}$$

$$10. \frac{50 \text{ L}}{1} \times \frac{1 \text{ mole}}{22.4 \text{ L}} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mole}} = \frac{301 \times 10^{23}}{22.4} = 13.4 \times 10^{23} = 1.34 \times 10^{24} \text{ molecules}$$

$$11. \frac{5.0 \times 10^{24} \text{ molecules}}{1} \times \frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ molecules}} \times \frac{22.4 \text{ L}}{1 \text{ mole}} = \frac{112 \times 10^{24}}{6.02 \times 10^{23}} = 1.86 \times 10^2 = 186 \text{ L}$$

$$12. \frac{7.5 \times 10^3 \text{ mL}}{1} \times \frac{1 \text{ L}}{1000 \text{ mL}} = \frac{7500 \text{ L}}{1000} = 7.5 \text{ L}$$