

# DIMENSIONAL ANALYSIS PROBLEMS

## Conversions Factors

1 hr = 60 min	1 min = 60 sec	1 ton = 2000 lbs	7 days = 1 week
24 hrs = 1 day	1 kg = 2.2 lbs	1 gal = 3.79 L	264.2 gal = 1 cubic meter
1 mi = 5,280 ft	1 kg = 1000 g	1 lb = 16 oz	20 drops = 1 mL
365 days = 1 yr	52 weeks = 1 yr	2.54 cm = 1 in	1 L = 1000 mL
0.621 mi = 1.00 km	1 yd = 36 inches	1 cc is 1 cm <sup>3</sup>	1 mL = 1 cm <sup>3</sup>

**DIRECTIONS:** Solve each problem using dimensional analysis. Every number must have a unit.

### **Work must be shown.**

- 1) How many miles will a person run during a 10 kilometer race?
- 2) The moon is 250,000 miles away. How many feet is it from earth?
- 3) A family pool holds 10,000 gallons of water. How many cubic meters is this?
- 4) How many seconds are there in 1 year?
- 5) Lake Michigan holds  $1.3 \times 10^{15}$  gallons of water. How many liters is this?
- 6) Pepsi puts 355 ml of pop in a can.  
\* How many drops is this?  
\* How many cubic meters is this?
- 7) Sixty miles/ hour is how many ft/sec?
- 8) Lake Michigan holds  $1.3 \times 10^{15}$  gallons of water. If just Chicago removed water from the lake and it never rained again, how many days would the water last?
- 9) How many minutes are in 180.0 days?
- 10) If a person weighs 125 lbs, 8 oz., how many mg does s/he weigh?
- 11) Santa Maria has an elevation of  $6.30 \times 10^5$  mm. How many km is this elevation?
- 12) If a projectile travels  $3.00 \times 10^3$  feet in one second, how far will it travel in 18 minutes?
- 13) If a swimmer swims 85.4 yards in five minutes, how many meters will s/he swim in 70.0 seconds?
- 14) How many grams are equivalent to  $1.80 \times 10^{-4}$  tons? (English tons)
- 15) A gas station is charging \$3.299 per gallon of gas. What would be the price for a liter of gas?
- 16) Determine the number of years in  $8.35 \times 10^6$  minutes.
- 17) A quart of a liquid has a mass of 2.70 kilograms. How many quarts will take to weigh 100.0 pounds?
- 18) Sixty-two months is equivalent to how many seconds?
- 19) 0.0054 weeks is equivalent to how many minutes?
- 20) How many feet per second is a wave going if it travels a distance of one mile in 7.35 seconds?