Literal Equations & Unit Cancellation (Dimensional Analysis)

Unit conversions

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 cm³	1 mL = 1 cm³

Solve each problem using dimensional analysis. Every number must have a unit. Work must be shown. Conversion factors are given above.

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. Sixty miles per hour is how many feet per second?

5. A small herd of cattle consumes fourteen bales of hay in two weeks. How many bales will this herd consume in a year?

6. Saffron costs $368.00 per ounce. Determine how many grams you can purchase for $15.00.

7. Trent purchases 44 euros worth of souvenirs while on vacation in France. If $1 U.S. = 0.678 euros, find the cost of the souvenirs in U.S. dollars. Round to the nearest cent.

Solve each equation or formula for the variable indicated.

8. $A = \dfrac{h(a+b)}{2}$, solve for h

9. xy + w = 9, solve for y

10. $\dfrac{p+9}{5} = r$, solve for p

11. kn + 4f = 9v, solve for n

---

12. If a 2 day rafting trip covers a distance of 60 miles and you are expected to raft 8 hours each day, how many miles must you raft each hour?

13. The formula C = πd represents the circumference of a circle, or the distance around the circle, where d is the diameter. If an airplane could fly around Earth at the equator without stopping, it would have traveled about 24, 900 miles. Find the diameter of Earth to the nearest whole number.

14. The surface area of a rectangular solid is given by the formula   x = 2lw + 2lh + 2wh, where l = length, w = width, and h = height.
    a.   Solve the formula for h.

    b.   The surface area of a rectangular solid with length 6 centimeters and width 3 centimeters is 72 square centimeters. Find the height.

15. The price of a ream of paper is $4.00.   There are 500 sheets of paper in a ream. If a sheet of paper weighs 0.50 oz., what is the price of one pound of paper? (16 oz = 1 pound)

16. What is the cost to drive from Atlanta to Orlando, a distance of 475 miles, if the cost of gasoline is $3.59 a gallon and the minivan gets 25 miles per gallon?

17. You have been working at a fast food restaurant for the past 35 years wrapping hamburgers. Each hour you wrap 184 hamburgers. You work 8 hours per day, 5 days a week and get paid every 2 weeks with a salary of $840.34. How many hamburgers will you have to wrap to make your first one million dollars?