1) 7 mi to yd

\[
\left(\frac{7 \text{ mi}}{1}\right) \left(\frac{5280 \text{ ft}}{1 \text{ mi}}\right) \left(\frac{1 \text{ yd}}{3 \text{ ft}}\right) = \frac{36960 \text{ yd}}{3} = 12,320 \text{ yd}
\]

3) 11.2 mg to g

\[
\left(\frac{11.2 \text{ mg}}{1}\right) \left(\frac{1 \text{ g}}{1000 \text{ mg}}\right) = \frac{11.29}{1000} = 0.0112 \text{ g}
\]

5) 9,800,000 mm to mi

\[
\left(\frac{9,800,000 \text{ mm}}{1}\right) \left(\frac{1\text{ in}}{1000 \text{ mm}}\right) \left(\frac{3.29 \text{ ft}}{1 \text{ in}}\right) \left(\frac{1 \text{ mi}}{5280 \text{ ft}}\right) = \frac{32,144,000 \text{ mi}}{5280000} = 6.088 \text{ mi}
\]

7) 435,000 m² to km²

\[
\left(\frac{435,000 \text{ m}^2}{1}\right) \left(\frac{1 \text{ km}}{1,000 \text{ m}}\right)^2 = \frac{435,000 \text{ km}^2}{1,000,000} = 0.435 \text{ km}^2
\]

9) 0.0065 km³ to m³

\[
\left(\frac{0.0065 \text{ km}^3}{1}\right) \left(\frac{1000 \text{ m}}{1 \text{ km}}\right)^3 = \frac{0.0065 \text{ m}^3}{1,000,000} = 6,500,000 \text{ m}^3
\]

11) 5,500 cm³ to yd³

\[
\left(\frac{5,500 \text{ cm}^3}{1}\right) \left(\frac{1 \text{ in}}{2.54 \text{ cm}}\right)^3 \left(\frac{1 \text{ yd}}{36 \text{ in}}\right)^3 = \frac{5,500 \text{ yd}^3}{764554.858} = 0.00719 \text{ yd}^3
\]

13) 185 yd/min to min/hr

\[
\left(\frac{185 \text{ yd}}{1 \text{ min}}\right) \left(\frac{3 \text{ min}}{1 \text{ yd}}\right) \left(\frac{1 \text{ mi}}{5280 \text{ yd}}\right) \left(\frac{60 \text{ min}}{1 \text{ hr}}\right) = \frac{33300 \text{ mi}}{5280 \text{ hr}} = 6.307 \text{ mi/hr}
\]

15) 248 mi/hr to m/sec

\[
\left(\frac{248 \text{ mi}}{1 \text{ hr}}\right) \left(\frac{1.61 \text{ mi}}{1 \text{ m}}\right) \left(\frac{1000 \text{ m}}{1 \text{ mi}}\right) \left(\frac{1 \text{ hr}}{3600 \text{ sec}}\right) = \frac{399.280 \text{ m}}{3600 \text{ sec}} = 110.9 \text{ m/sec}
\]

17) 7.5 \frac{F}{yd^2} to lbs/in²

\[
\left(\frac{7.5 \text{ lb}}{1 \text{ in}^2}\right) \left(\frac{2000 \text{ lb}}{17} \text{ lb} \right) \left(\frac{1 \text{ yd}^2}{1296 \text{ in}^2}\right) = \frac{15000 \text{ lbs}}{1296 \text{ in}^2} = 11.57 \text{ lbs/in}^2
\]
19) On a recent trip, Jan traveled 260 miles using 8 gallons of gas. How many miles per 1-gallon did she travel? How many yards per 1-ounce?

\[ \frac{260 \text{ mi}}{8 \text{ gal}} = 32.5 \text{ mi/gal} \]

\[ \left( \frac{32.5 \text{ mi}}{8 \text{ gal}} \right) \left( \frac{5280 \text{ ft}}{1 \text{ mi}} \right) \left( \frac{1\text{ yd}}{3 \text{ ft}} \right) \left( \frac{1\text{ gal}}{4\text{ fl. oz.}} \right) \left( \frac{1\text{ oz}}{2\text{ fl. oz.}} \right) \left( \frac{1\text{ fl. oz.}}{8\text{ oz.}} \right) = \frac{171,600 \text{ yd}}{384 \text{ oz}} = 446.875 \text{ yd/oz} \]

21) A certain laser printer can print 12 pages per minute. Determine this printer’s output in pages per day, and reams per month. (1 ream = 5000 pages)

\[ \left( \frac{12 \text{ pg}}{1 \text{ min}} \right) \left( \frac{60 \text{ min}}{1 \text{ hr}} \right) \left( \frac{24 \text{ hr}}{1 \text{ day}} \right) = 17280 \text{ pg/day} \]

\[ \left( \frac{17280 \text{ pg}}{\text{day}} \right) \left( \frac{30 \text{ days}}{1 \text{ month}} \right) \left( \frac{1 \text{ ream}}{5000 \text{ pg}} \right) = \frac{5184000 \text{ reams}}{5000 \text{ months}} = 103.68 \text{ reams/month} \]

23) Blood sugar levels are measured in milligrams of glucose per deciliter of blood volume. If a person’s blood sugar level measured 128 mg/dL, how much is this in grams per liter?

\[ \left( \frac{128 \text{ mg}}{1 \text{ deciliter}} \right) \left( \frac{1 \text{ g}}{100 \text{ mg}} \right) \left( \frac{10 \text{ deciliter}}{1 \text{ L}} \right) = \frac{128 \text{ g}}{1000 \text{ L}} = 1.28 \text{ g/L} \]

25) A car travels 14 miles in 15 minutes. How fast is it going in miles per hour? in meters per second?

\[ \left( \frac{14 \text{ mi}}{15 \text{ min}} \right) \left( \frac{60 \text{ min}}{1 \text{ hr}} \right)^2 = \frac{840 \text{ mi}}{15 \text{ hr}} = 56 \text{ mi/hr} \]

\[ \left( \frac{14 \text{ mi}}{15 \text{ min}} \right) \left( \frac{1.61 \text{ m/s}}{1 \text{ mi}} \right) \left( \frac{1000 \text{ m}}{1 \text{ km}} \right) \left( \frac{1 \text{ km}}{60 \text{ sec}} \right) = \frac{22540 \text{ m}}{900 \text{ sec}} = 25.04 \text{ m/sec} \]

27) A local zoning ordinance says that a house’s “footprint” (area of its ground floor) cannot occupy more than \( \frac{1}{4} \) of the lot it is built on. Suppose you own a \( \frac{1}{3} \) acre lot, what is the maximum allowed footprint for your house in square feet? in square inches? (1 acre = 43560 \text{ ft}^2)

\[ \left( \frac{1 \text{ acre}}{3} \right) \left( \frac{43560 \text{ ft}^2}{1 \text{ acre}} \right) \left( \frac{1}{4} \right) = \frac{43560 \text{ ft}^2}{12} = 3,630 \text{ ft}^2 \]

\[ \left( \frac{3630 \text{ ft}^2}{1} \right) \left( \frac{12\text{ in}}{1\text{ ft}} \right)^2 = 522,720 \text{ in}^2 \]

29) In April 1996, the Department of the Interior released a “spike flood” from the Glen Canyon Dam on the Colorado River. Its purpose was to restore the river and the habitants along its bank. The release from the dam lasted a week at a rate of 25,800 cubic feet of water per second. About how much water was released during the 1-week flood

\[ \left( \frac{25,800 \text{ ft}^3}{1 \text{ fl. oz}} \right) \left( \frac{3600 \text{ fl. oz}}{1 \text{ ft}} \right) \left( \frac{24 \text{ fl. oz}}{1 \text{ day}} \right) \left( \frac{7 \text{ days}}{1 \text{ wk}} \right) = 15,603,840,000 \text{ ft}^3/\text{week} \]