

**Math 7 - Sections 1.1-1.3
Review Problems
Station # 4
Dimensional Analysis**

Key

Things to remember:

- * Write the original problem on far left of the paper.**
- * Write the GOAL on the far right of the paper.**
- * Record measurement units you use in the bottom right of your paper.**
- * Choose names for 1 that will cancel out the measurement units you do not need.**
- * Once you reach your goal, record the numbers from the numerator and denominator.**
- * Do the arithmetic and remember to label your answer.**

1) Use dimensional analysis to solve this problem. 54.6 inches = _____ feet

$$\frac{54.6 \cancel{\text{in}}}{1} \cdot \frac{1 \text{ ft}}{12 \cancel{\text{in}}}$$

ft

$$\frac{(54.6)(1)}{(1)(12)}$$

$$\frac{54.6}{12}$$

4.55 feet

$$12 \text{ in} = 1 \text{ ft}$$

2) Use dimensional analysis to convert 920 kilometers per hour to meters per hour.

$$\frac{920 \text{ km}}{1 \text{ hr}} \cdot \frac{1000 \text{ m}}{1 \text{ km}}$$

$$\left\{ \frac{\text{m}}{\text{hr}} \right.$$

$$\frac{920(1000)}{(1)(1)}$$

$$920,000 \text{ m/hr.}$$

$$1 \text{ km} = 1000 \text{ m}$$

3) Use dimensional analysis to convert 840 pounds per hour to ounces per minute.

$$\frac{840 \text{ lb.}}{1 \text{ hr.}} \cdot \frac{16 \text{ oz.}}{1 \text{ lb.}} \cdot \frac{1 \text{ hr.}}{60 \text{ min.}}$$

$$\left\{ \frac{\text{oz.}}{\text{min.}} \right.$$

$$\frac{840(16)(1)}{(1)(1)(60)}$$

$$\frac{13440}{60}$$

$$224 \text{ oz/min}$$

$$\boxed{1 \text{ lb} = 16 \text{ oz}}$$
$$\boxed{1 \text{ hr} = 60 \text{ min}}$$

4) Use dimensional analysis to convert 800 milliliters per minute to liters per hour.

$$\frac{800 \text{ mL}}{1 \text{ min}} \cdot \frac{1 \text{ Liter}}{1000 \text{ mL}} \cdot \frac{60 \text{ min}}{1 \text{ hr}}$$

Liters
hour

$$\frac{(800)(1)(60)}{(1)(1000)(1)}$$

$$\frac{48,000}{1000}$$

48 L/hr.

1000 mL = 1 Liter
60 min = 1 hr.

5) Convert 240 quarts per hour to gallons per day

$$\frac{240 \text{ qt}}{1 \text{ hr}} \cdot \frac{1 \text{ gal}}{4 \text{ qt}} \cdot \frac{24 \text{ hr}}{1 \text{ day}}$$

$\frac{\text{gal}}{\text{day}}$

$$\frac{(240)(1)(24)}{(1)(4)(1)}$$

$$\frac{5760}{4}$$

1440 gal/day

$$\begin{array}{l} 4 \text{ qt} = 1 \text{ gal} \\ 24 \text{ hr} = 1 \text{ day} \end{array}$$

6) An elephant drinks about 5280 milliliters per day. Use dimensional analysis to show how many liters per hour this is.

$$\frac{5280 \text{ mL}}{1 \text{ day}} \cdot \frac{1 \text{ L}}{1000 \text{ mL}} \cdot \frac{1 \text{ day}}{24 \text{ hours}}$$

Liter
hour

$$\frac{(5280)(1)(1)}{(1)(1000)(24)}$$

$$\frac{5280}{24000}$$

0.22 L/hr.

$$\begin{array}{l} 1000 \text{ mL} = 1 \text{ L} \\ 1 \text{ day} = 24 \text{ hours} \end{array}$$

7) Matt runs at a speed of 360 yards per minute. How many feet per hour is this? Show steps using dimensional analysis.

$$\frac{360 \text{ yd}}{1 \text{ min}} \cdot \frac{3 \text{ ft}}{1 \text{ yd}} \cdot \frac{60 \text{ min}}{1 \text{ hr}}$$

$$\left\{ \frac{\text{ft}}{\text{hr.}} \right.$$

$$(360)(3)(60)$$

$$64,800 \text{ ft/hr.}$$

$$\begin{array}{|l} 1 \text{ yd} = 3 \text{ ft} \\ 1 \text{ hr} = 60 \text{ min} \end{array}$$