

Remember

Write out all information as fractions.

Make sure all numbers have units

Write out the units you want when you are through

Flip the units you need to in order for all other units to cancel

Multiply and divide to get your final answer.

1. If you are traveling at a speed of 45 miles per hour, and there are 0.621 miles in a kilometer, how long does it take to travel 100 kilometers?

$$\frac{45 \text{ miles}}{1 \text{ hour}} \text{ or } \frac{45 \text{ miles}}{1 \text{ hour}}$$

$$\frac{0.621 \text{ miles}}{1 \text{ kilometer}} \text{ or } \frac{1 \text{ kilometer}}{0.621 \text{ miles}}$$

$$\frac{100 \text{ km}}{0.621 \text{ miles}} \left| \frac{1 \text{ km}}{0.621 \text{ miles}} \right| \frac{45 \text{ miles}}{1 \text{ hour}} = \frac{62.1}{45}$$

$$\boxed{= 1.38 \text{ hrs}}$$

2. The density of aluminum is 2.70 grams/mL, and there are 454 grams in a pound, what is the volume (mL) of 2.5 pounds of aluminum?

$$\frac{2.70 \text{ grams}}{1 \text{ mL}} \text{ or } \frac{1 \text{ mL}}{2.70 \text{ grams}}$$

$$\frac{454 \text{ grams}}{1 \text{ pound}} \text{ or } \frac{1 \text{ pound}}{454 \text{ grams}}$$

$$2.5 \text{ pounds} \left(\frac{454 \text{ grams}}{1 \text{ pound}} \right) \left(\frac{1 \text{ mL}}{2.70 \text{ grams}} \right) = 420 \text{ mL}$$

Dimensional Analysis Practice

Name:

Key

Date:

do not worry about sig figs

Dimensional Analysis Practice 2

Name: Levi

Date: _____

Precious metals and gems are measured in troy weights in the English system

- 24 grains = 1 pennyweight
- 20 pennyweight = 1 troy ounce
- 12 troy ounces = 1 troy pound
- 1 grain = 0.00648 grams
- 1 carat = 0.200 gram

don't worry about sig figs

1. What is the mass of a troy ounce of gold in grams and carats?

a) $1 \text{ troy ounce} \left(\frac{20 \text{ pennyweight}}{1 \text{ troy ounce}} \right) \left(\frac{24 \text{ grains}}{1 \text{ pennyweight}} \right) \left(\frac{1 \text{ gram}}{0.00648 \text{ g}} \right) = 3.1104 \text{ grams}$

b) $1 \text{ troy ounce} \left(\frac{20 \text{ pennyweight}}{1 \text{ troy ounce}} \right) \left(\frac{24 \text{ grains}}{1 \text{ pennyweight}} \right) \left(\frac{1 \text{ gram}}{0.00648 \text{ g}} \right) \left(\frac{0.200 \text{ carat}}{1 \text{ gram}} \right) = 15.552 \text{ carat}$

2. The density of gold is 19.3 g/cm³. What is the volume of a troy pound of gold?

$$1 \text{ troy pound} \left(\frac{12 \text{ troy ounce}}{1 \text{ troy pound}} \right) \left(\frac{20 \text{ pennyweight}}{1 \text{ troy ounce}} \right) \left(\frac{24 \text{ grains}}{1 \text{ pennyweight}} \right) \left(\frac{0.00648 \text{ g}}{1 \text{ grain}} \right) \left(\frac{1 \text{ cm}^3}{19.3 \text{ g}} \right) \left(\frac{1 \text{ mL}}{1 \text{ cm}^3} \right) = 1.93 \text{ mL}$$

3. Convert 0.00152 km to cm. There are 1000 m in a km and 100 cm in a meter.

$$0.00152 \text{ km} \left(\frac{1000 \text{ m}}{1 \text{ km}} \right) \left(\frac{100 \text{ cm}}{1 \text{ m}} \right) = 152 \text{ cm}$$

4. We can go 500 miles on one tank of gas, and each tank holds 15 gallons of gas. If gas costs \$3.00 per gallon, how much does it cost to go 6000 miles?

$$6000 \text{ miles} \left(\frac{1 \text{ tank}}{500 \text{ miles}} \right) \left(\frac{15 \text{ gallons}}{1 \text{ tank}} \right) \left(\frac{3 \text{ dollars}}{1 \text{ gallon}} \right) = 540 \text{ dollars}$$

5. If the gram atomic mass of carbon is 12.0 g/mole, how many moles are in 30.0 g of carbon?

$$30.0 \text{ g} \left(\frac{1 \text{ mol}}{12 \text{ g}} \right) = 2.5 \text{ mol}$$