

GS106 In-Class Exercise
Unit Algebra / Equation Problem Set

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Part 1 - Unit Conversion

Here are some common conversion factors that you will need to solve the problems:

1 m = 100 cm	1 kg = 1000 g	1 m = 3.28 ft	1 yr = 365 day	1 min = 60 sec
1 m = 1000 mm	1 km = 1000 m	1 km = 0.62 mi	1 day = 24 hr	
1 g = 1000 mg	1 in = 2.54 cm	1 mi = 5280 ft	1 hr = 60 min	

Using the attached metric and English measurement unit conversion tables, complete the following conversions.
SHOW ALL OF YOUR MATH WORK AND UNIT ALGEBRA IN THE SPACE PROVIDED.

2.05 m = _____ cm

2×10^9 ft = _____ mi

1.50 m = _____ mm

126,765,000 ft = _____ km

5.4 g = _____ mg

72° C = _____ °F

(note the temperature conversion formulas are in your notes... see the math and physics review)

6.8 m = _____ km

8° F = _____ °C

4214.6 cm = _____ m

0°C = _____ °F

321.5 g = _____ kg

212°F = _____ °C

5.3 in = _____ cm

5.7×10^{45} sec = _____ years

109.4 m = _____ ft

9.8×10^{20} days = _____ years

1 mi = _____ km

2.0×10^{31} in = _____ km

123.4 mi = _____ km

If 1 inch equals 2000 ft on a map; points A and B are 7.8 inches apart on the map. How far apart are points A and B on the ground in feet? Now how about in miles?

1234 km = _____ mi

1054 lb = _____ kg

2×10^5 in = _____ mi

Part 2. Solving Equations

A. The density of a substance is defined by it's mass divided by it's volume. The equation has the following form:

$$D = M / V$$

where D is density in gm/cm³, M = mass in grams, and V is volume in cm³

1. You measure the mass of a substance as 2356 gm. It's volume is 534 cm³, calculate it's density in gm/cm³. **SHOW THE FORMULA AND ALL OF YOUR MATH WORK!**

2. The density of a substance is 9.8 gm/cm³. If you had a volume of 3.8 cm³ of the substance, what would be the corresponding mass in grams? Hint: Rearrange the density equation to solve for mass. **SHOW THE FORMULA AND ALL OF YOUR MATH WORK!**

3. The density of a substance is 2.5 gm/cm³ and you possess 15.3 grams of that material. What will be it's corresponding volume in cm³. Hint: Rearrange the density equation to solve for mass. **SHOW THE FORMULA AND ALL OF YOUR MATH WORK!**

B. The velocity of moving objects (for example your car while driving) is measure as a rate of motion, according to the following equation:

$$V = d / t$$

where V is velocity (m/sec), d is distance (m), and t is time (sec).

4. You drive your car between two cities that are 123 miles apart. It takes you 4 hours to get there. Calculate your average velocity in mi/hr. **SHOW THE FORMULA AND ALL OF YOUR MATH WORK!**

5. Using the velocity you caculated in 4 above, what was your velocity in m/sec? Hint: you will have to use a distance and time conversion factor. **SHOW THE FORMULA AND ALL OF YOUR MATH WORK!**

6. You are driving a car at a velocity of 10 m/sec for a distance of 12 km. How long did it take you to get there? Answer in hours. **SHOW THE FORMULA AND ALL OF YOUR MATH WORK!**