NAME_____

Su2019/ CHEM1301/ Homework 3

Due: 7/11/2019

1. Use dimensional analysis to complete the following SIMPLE unit conversions.

a) Convert 84.100 yards (yds) to inches
b) Convert 84.100 inches to yards
c) Convert 3.706 days to seconds
d) 12.004 gallons to fl oz
e) 14.600 pounds to oz
f) 87.304 Liters (L) to cups
g) 1.203 x 10^8 miles to cm
h) 4.500 minutes to weeks

2. Write the conversion factor from prefix multipliers needed for the following metric conversions.

	Conversion Factor:
Example: pm to m	$1pm = 10^{-12}$ m
a) kg to g	
b) g to μg (micro)	
c) ML to L	
d) m to cm	
e) ns to s	

3. Using prefix multipliers, perform the following metric conversions. Show all work to receive credit, and mind your sig figs!

a) Convert 1.65 L to mL.
b) Convert 4.32×10^6 mL to L
c) Convert 789.35 nm to m
d) Convert 6.48×10^{-8} kg to g
e) Convert 4.653×10^{10} s to Ms

4. Using prefix multipliers, perform the following metric conversions. Show all work to receive credit, and mind your sig figs!

a) Convert 1.42 kg to mg
b) Convert 131 µs to ms
c) Convert 1.26 x 10⁴ Tm to Mm
d) Convert 12.7 nK to µK
e) Convert 4.268 x 10⁻⁵ km to mm

5. Shake it up: Use both conventional conversion factors and metric prefix multipliers to complete the following.

a) convert 14.65 cups to mL
b) convert 2.34 x 10²³ ns to days

6. Complete the table below with conversion factors for the following volume and area conversions.

	Conversion Factor:
Example: pm² to m²	1pm = 10^{-12} m so, square numbers and units to give: **1pm² = 10^{-24} m²**
a) km³ to m³	
b) m² to µm² (micro)	
c) cm³ to m³	
d) in² to ft²	
e) ft³ to mi³	

7. Convert the following quantities with units of area and volume.

Convert 14.23 cm² to in²
Convert 1.65 x 10^{12} cm³ to m³
Convert 5.32 x 10^{-6}km² to mm²

8. Calculate the density of a sample that has a mass of 35.62 g and a volume of 4.35 cm^3.

9. Glycerol is a liquid found in some cosmetics. A 1.50 L bottle of glycerol has a mass of 1.75x 10^{3}g. What is the density of glycerol in kg per m^3? (kg/m^3)

10. A ring made of pure gold has a density of 19.32 g/cm^3. The mass of a ring made of pure gold is 12.654g. What volume in (cm^3) does the ring displace?

11. Another sample of gold has a volume of 21.05 in^3. Using the density above, what is the mass in pounds of this sample?

12. An average molecule in the room is moving at 500 m/s. What is that speed in miles per hour?