Metric Conversions / Dimensional Analysis

Name: _____

<u>Part I</u>: Dimensional Analysis *(Factor Labeling)* – ALL UNITS (Non-Metric)!

<u>Conversion Factors</u>:

1 mL = 1 cm^3	1 cal = 4.184 Joules	1 mol = 6.02 x 10^{23} atoms	1 hr = 3600 sec
1 mol = 22.4 L	1 atm = 101.3 kPa = 760 mmHg	1 hr = 60 min	1 min = 60 sec

Example #1: 53.0 L = ? mol → _____ mol

Example #2: 3.40 kPa = ? mmHg → _____ mmHg

Example #3: 600. sec = ? min → _____ min

Perform the following conversions by showing the *<u>DIMENSIONAL ANALYSIS METHOD</u>*. Show units in answer!

1) 850. Joules = ? cal → _____ (in scientific notation form)

2) 12.0 cm^3 = ? mL → _____ (in scientific notation form)

3) 4.20 atm = ? kPa → _____

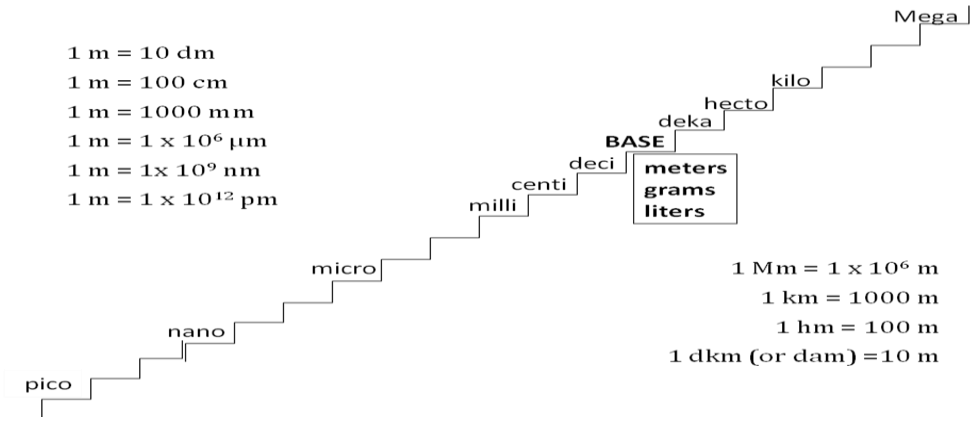
4) 800. mmHg = ? atm → _____ (in scientific notation form)

5) 2.93 mol = ? atoms → _____

6) 39.0 L = ? mol → _____

7) 8.90 x 10^{25} atoms = ? mol → _____

8) 3.20 min = ? sec → _____



<u>Part II</u>: Dimensional Analysis *(Factor Labeling)* – METRIC SYSTEM!

Example #1: 23.0 km = ? m → _____ m

Example #2: 133 cm = ? km → _____ km

Example #3: 0.800 hm = ? mm → _____ mm

Perform the following conversions by showing the *<u>DIMENSIONAL ANALYSIS METHOD</u>*. Show units in answer!

9) 35.0 hm = ? m → _____

10) 180. pg = ? g → _____ (in scientific notation form)

11) 2.50 km = ? dm → _____

12) 964 nm = ? cm → _____

13) 10,340 μL = ? hL → _____ (in standard form)

14) 40.0 mL = ? μL→ _____

<u>Part III</u>: Complete the following table using the given information. <u>NOTE</u>: Research may be required for various derived quantities.

Unit Name / Measurement	S.I. Unit Symbol	Concept/Idea	Fundamental or Derived?	Related Unit(s)
	kg		Fundamental	
		length x width x height		dm^3
		temperature: average kinetic energy of particles		Celsius, Fahrenheit
	g/mL		Derived (from mass, volume)	
	m/s^2	gravity		