

CHM 1020  
Practice calculations

I Scientific Method

- (multiple choice) The first step of the scientific method involves:
  - forming a hypothesis.
  - making observations.
  - performing an experiment.
  - predicting the result of an experiment
- (multiple choice) A pattern or relationship that has been established based on a large amount of experimental data is a:
  - theory
  - hypothesis
  - law
- Energy can be of 2 types and many different forms. Please discuss energy conversions in these everyday situations:
  - Heating water on a gas stove.
  - Eating a pasta meal and then running 11 miles.
- Determine the number of significant figures in 547.40
- Determine the number of significant figures in  $5.40 \times 10^3$ .
- Determine the number of significant figures in 0.0005870
- Determine the number of significant figures in  $5.30 \times 10^6$
- Write the number 5230 in scientific notation to 3 significant figures:
- Write the number 0.00000056 in scientific notation to the correct number of significant figures:
- Write the number 473,000 in scientific notation to the correct number of significant figures:
- Write the number  $5.76 \times 10^6$  in normal notation to the correct number of significant figures:
- Write the number  $4.3 \times 10^{-8}$  in normal notation to the correct number of significant figures:
- To scientific notation  
0.00000321  
2405  
529  
1,400,000  
From scientific notation  
 $1.4 \times 10^{-5}$   
 $3.33 \times 10^{-9}$   
Convert  
Your **height** to meters  
*Somebody's* **weight** to kilograms  
Your **shoe size** (which is inches, sort of) to centimeters

14.  $(7.44 \times 10^7) \times (1.44 \times 10^4) =$   
 15.  $(9.68 \times 10^{-4}) \div (8.59 \times 10^{-7}) =$   
 16.  $(4.34 \times 10^{-9}) \times (9.72 \times 10^3) =$   
 17.  $(8.84 \times 10^5) \times (6.76 \times 10^4) \div (7.83 \times 10^{-7}) =$

**18. Conversion factors**

19. 276 g = ? kg  
 20. 31.9 g = ? mg  
 21. 191 mg = ? kg  
 22. 25.9 km = ? m  
 23. 4.27 mm = ? m  
 24. 231 mL = ? L  
 25. 60.1 mL = ? cm<sup>3</sup>  
 26. Complete the following table of temperatures:

°C	°F	K
	40 °F	
		590 K
-13 °C		
		229 K
440 °C		
	-314 °F	

26. Acetone has a density of 0.82g/ml. What is the volume (in ml) of 56 g of acetone? *(Use the factor label method and show your work.)*  
 27. If 35.3 milliliters of alcohol has a density of 0.790 g/mL, what is the mass (in grams) of the alcohol in this sample?  
*Use the factor label method and show your work.*  
 28. If 1.51 kilograms of magnesium metal corresponds to a volume of 865 cm<sup>3</sup>, what is the density of Mg?  
*Use the factor label method and show your work.*  
 29. Copper has a density of 8.92 g/ml. What is the volume (in ml) of 40.0 g of copper? Use the factor label method and show your work.  
 30. What is the volume, in mL, of 0.500 lbs of alcohol? The density of alcohol is 0.780 g/mL  
 31. How many pounds of mercury are in 291 mL? The density of mercury is 13.69 g/mL  
 32. Fill in the following table:

mass (grams)	Volume (cc or mL)	density (g/cc) or (g/mL)
28.8		0.803
	44.4	2.01
51.9	23.5	