Name: _____

Honors Chapter 3 Practice Sheet

Section 3.1:

Write the following numbers in scientific notation.
1.
2. 34900000000m   4. 4500000mL
3. 0.000912s   5. 0.03°C

Write the following numbers in standard notation.
6.
7. 4.782×10^{-9}kg   9. 2.63×10^{6}mol
8. 6.6×10^{3}mi   10. 9.77×10^{-4}J

11. Three lab groups take the mass of a block of aluminum with a known mass of 6.72g. Group 1 recorded the mass as 6.6g, group 2 recorded the mass as 6.84g, and group 3 recorded the mass as 6.79g. Was their data accurate, precise, neither, or both?
12. Three lab groups take the volume of a sample of water with a known mass of 10.4mL. Group 1 recorded the volume as 10.7mL, group 2 recorded the volume as 27.8mL, and group 3 recorded the volume as 3.9mL. Was their data accurate, precise, neither, or both?
13. A student conducts an experiment and collects 30.7g of product. He should have collected 53.9g of product. What was his error? What was his percent error?

Underline the significant figures in the following numbers.
14.
15. 40700.2m   18. 3.98×10^{4}kg
16. 20.700s   19. 40 buttons
17. 0.00409800L   20. 2700cm

Answer the following calculations with the correct number of significant figures.

21. 40.08g + 2.7g =
22. (0.099m + 18.72m) x 1.290m =
23. $\underline{(30.9m - 12m)}$ =
            13.30s

Section 3.2:

24. What is the difference in mass and weight?
25. If you went to Jupiter with a much larger gravity than Earth, what would happen to your mass and weight?

26. Fill in the following chart.

Measurement	SI Unit	Abbreviation
Temperature		
		m
	candela	
		A
	mole	
Time		
		kg

27. What is absolute zero? Which temperature scale is it on?
28. Why can Kelvin never be negative? (BE SPECIFIC – Don't just tell me that it has absolute zero)

   Convert the following temperatures.

29.
30. 792K = _____ °C
31. 43.8°C = _____ K
32. 72°C = _____ °F

33. 123°F = _____ °C
34. 650K = _____ °F
35. 200°F = _____ K

36. What is the conversion factor between Joules and calories?

Section 3.3:

Make the following conversions.

37. Convert 37days into seconds.
38. Convert 6.5Mm into meters.
39. Convert 9.8×10^4ns into kiloseconds.
40. Convert 9.85g/mL into kg/dL.
41. Convert 83.7cm³ into m³.
42. Convert 197kg/nm³ to g/cm³.
43. Convert 14.9ft into centimeters.
44. Convert 159lbs. into kilograms.

Section 3.4:
45. How does density normally change when temperature increases?

46. If a sample of copper has a mass of 16.9g and a volume of 3.7mL, then what is the density?

47. If an object has a density of 1.78g/cm³ and a volume of 12.3cm³, then what is the mass of the object?

48. An object has a mass of 165g and a density of 0.38g/mL, what is the volume of the object?

Additional Exercises:

49. Identify each of the following as measurements of length, area, volume, mass, density, time, or temperature:

a. 5 ns   e. 173 K
b. 5.5 kg/m³   f. 2 mm³
c. 0.88 pm   g. 23 °C
d. 540 km²   50.

51. Three spheres of equal size are composed of aluminum (density = 2.70 g/cm³), silver (density = 10.49 g/cm³), and nickel (density = 8.90 g/cm³). List the spheres from lightest to heaviest.

52. The following dart boards illustrate the types of errors often seen when one measurement is repeated several times. The bull's eye represents the "true value," and the darts represent the experimental measurements. Which board best represents each of the following scenarios:
a. measurements both accurate and precise
b. measurements precise but inaccurate
c. measurements imprecise by yield an accurate average

(i)   (ii)   (iii)

53. a. What is the length of the pencil in the following figure if the scale reads in centimeters? How many significant figures are there in this measurement?
b. An oven thermometer with a circular scale reading degrees Fahrenheit is shown. What temperature does the scale indicate? How many significant figures are in the measurement?

54. What is wrong with the following statement? Twenty years ago an ancient artifact was determined to be 1900 years old. It must now be 1920 years old.

55. a. How many significant figures should be reported for the volume of the metal bar shown below?

   b. If the mass of the bar is 104.7g, how many significant figures should be reported when its density is calculated using the calculated volume?
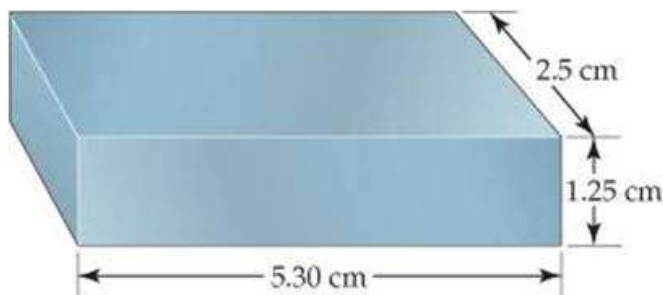
56. When you convert units, how do you decide which part of the conversion factor is in the numerator and which is in the denominator?

57. Round each of the following numbers to four significant figures, and express the result in scientific notation:
   a. 102.53070
   b. 656,980
   c. 0.008543210
   d. 0.000257870
   e. -0.0357202

58. A copper refinery produces a copper ingot weighing 150 lb. If the copper is drawn into wire whose diameter is 8.25 mm, how many feet of copper can be obtained from the ingot? The density of copper is 8.94 g/cm³ (Assume the wire is a cylinder whose volume is $V = \pi r^2 h$, where r is its radius and h is its height or length.)