New West Charter High School -- Chemistry -- Test #4 -- 75 points

Partial credit for partial performance. You must show all your work for that. Be clear and neat in your presentations. Pencils only.

1) What is the value of Avogadro's Number: _____ (2 points)

Seven points each.

2) Five million billion billion (5.00×10^{24}) molecules of water is how many moles? How many grams is that?

3) 7.25×10^{-3} moles of $CuSO_4 \bullet 5H_2O$ is how many grams?
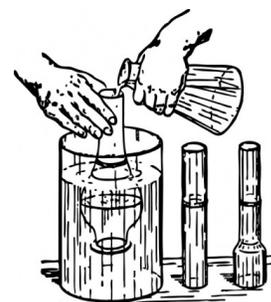
4) Find the molar mass of silicon chromate, $Si(CrO_4)_2$.

5) 500 g of cadmium sulfate trihydrate, $CdSO_4 \bullet 3H_2O$, contains how many oxygen atoms?

6) Find the percentage composition of copper (II) phosphate, $Cu_3(PO_4)_2$.
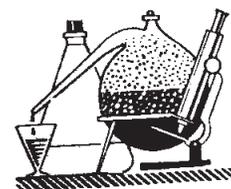
Ten points on this one.
7) A certain carbohydrate molecule is found to be 52.63% carbon, 42.11% oxygen, and the remainder
        hydrogen. If its molecular mass is 342 g/mol, find its empirical and molecular formula.

Two points each. Give the empirical formula for each compound below.

8) C_3H_6 9) N_2O_4
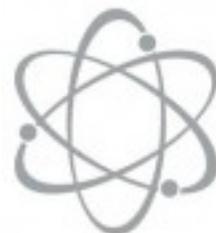
Ten points on this one.
9) Here is some data gathered regarding various lengths of nichrome wire. Your job is to graph it properly
        with axes, divisions, labels and title AND determine its linear mass density in its proper units.
        Get a ruler and use it (Hint: This is not connect the dots).
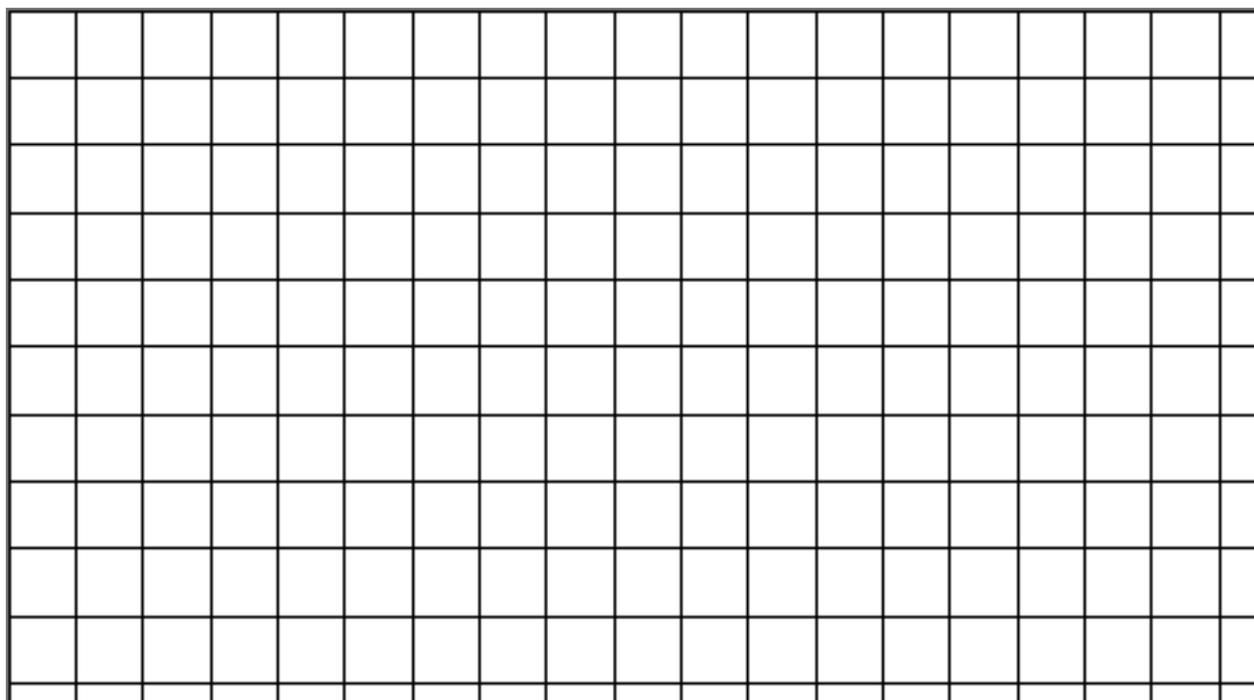
| Mass (g) | 4.97 | 6.04 | 8.16 | 9.97 | 12.1 | 14.1 | 15.9 |
| Length (cm) | 20.5 | 24.9 | 33.5 | 41.0 | 49.8 | 57.8 | 65.5 |

Seven points on these.

10) How many molecules of UF_6 are present in 7.29 grams of it?

11) A compound of carbon and hydrogen is found to be 85.71% C and 14.29% H. Its molecular weight is 70 amu. Find its empirical and molecular formulas.

12) **EXTRA CREDIT.** Five points, all or nothing. A man has two girlfriends, one in Santa Monica and one in Venice. When he gets to the bus stop, he says to himself, "Whichever bus gets here first, that's the girl I will go see." Both buses arrive exactly every ten minutes. After a few weeks, he notices that he sees the girl in Santa Monica about 80% of the time. But how can this be, since he gets to the bus stop at random times and they both arrive every ten minutes?