

$$D = m/v$$

$$0.62 \text{ miles} = \text{km}$$

$$1.05669 \text{ qt} = \text{L}$$

$$2.205 \text{ lbs} = \text{kg}$$

$$2.54 \text{ cm} = \text{inch}$$

$$K = 273.15 + C$$

$$28.35 \text{ g} = \text{ounce (dry)}$$

$$29.57 \text{ mL} = \text{ounce (liquid)}$$

$$\text{mL} = \text{cm}^3$$

$$\text{Volume of a cylinder} = \pi r^2 h$$

$$1000 \text{ L} = \text{m}^3$$

$$F = \frac{9}{5}C + 32$$

There are 21 questions on four pages. This exam is worth 100 points. Show your work. **No work = no points.** Report all answers to the correct number of significant figures, use scientific notation and correct units. When provided, put your answers in the box.

1. (5 points) A swimming pool is 9.28 m long, 4.32 m wide and 2.21 m deep. A pump can remove water at a rate of 1.20 L per second. How long will it take to decrease the water level by 28.4 cm?

2. (5 points) A penny weighs 2.498g. How much is 3.45 lbs of pennies worth?

3. (5 points) What is the density of a metal cylinder that weighs 68.54 grams. The cylinder is 3.2 cm long and has a diameter of 1.54 cm.

4. (5 points) A piece of metal is put into a graduated cylinder. Before the metal was added, the volume of water in the cylinder was 52.56 mL. After the metal was added to the graduated cylinder, the water level measured 62.54. The piece of metal weighed 72.67 g. What is the density of this piece of metal.

5. (5 points) There are two isotopes of Vanadium, ^{50}V has an atomic weight of 49.947163 amu and ^{51}V has an atomic weight of 50.943964 amu. The weighted average of both isotopes is 50.94150 amu. What is the percentage of each isotope of Vanadium?

6. (5 points) Michael Fiers is a pitcher for the A's who throws a 98.2 mile per hour fastball. What was this speed in m/s?

7. (5 points) A human hair is 0.09976 mm thick. Lithium atoms have a diameter of 145 pm. How many Lithium atoms can be laid across the diameter of a human hair?

8. (6 points) Write the correct names for these formulas, correct spelling is required:

a. KBr _____

b. NH_4NO_3 _____

c. PCl_5 _____

d. $\text{Ba}_3(\text{PO}_4)_2$ _____

e. Cu_2O_3 _____

f. $\text{K}_2\text{Cr}_2\text{O}_7$ _____

9. (7 points) Write the correct formulas for these compounds:

a. Strontium nitrite _____

b. Lithium sulfate _____

c. Copper(II) perchlorate _____

d. Chromium(III) oxide _____

e. Carbon dioxide _____

f. Calcium carbonate _____

g. Dinitrogen pentasulfide _____

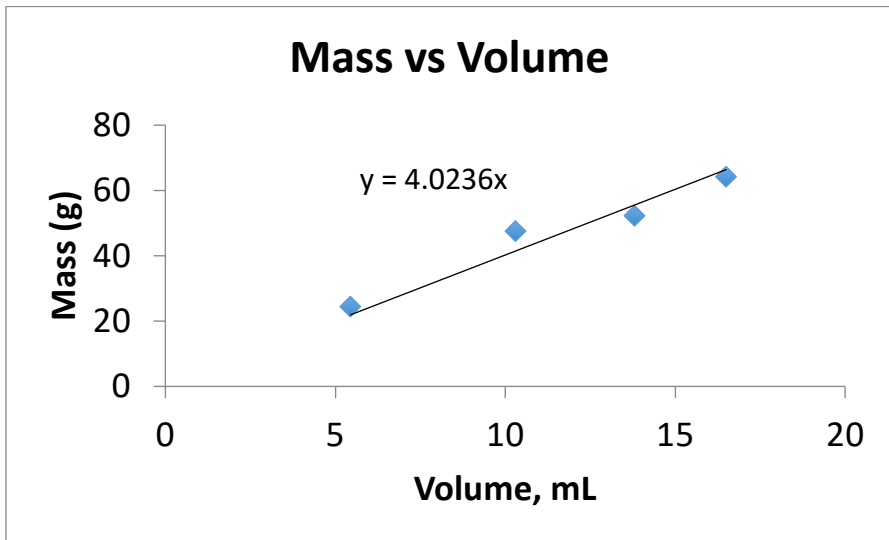
10. (6 points) Complete the following table

Isotope	Number of protons	Number of neutrons	Number of electrons
^{55}Mn			
^{14}N			

11. (12 points) Complete the following table

Name of particle	Symbol	Mass (amu)	Charge
Gamma			
Beta			
Neutron			
Alpha			

12. (5 points) Use the following graph to determine the density of an object



Fill in the blank, each question is worth 3 points.

13. Who discovered the neutron? _____

14. Who used the oil drop experiment to determine the charge on an electron? _____

15. What is used to determine if results from an experiment are accurate? _____

16. What is used to determine if results from an experiment are precise? _____

17. JJ Thomson used _____ to determine _____

18. What experiment provided evidence that atoms contained small very dense, massive nuclei with positive charges?

19. What are the bubbles that form in water after it has been boiling for 10 min? _____

20. What new element is formed when Strontium-90 emits an beta particle.

21. (5 points) How many picograms are in 1.356 kg?