We did this short sheet together as a class:
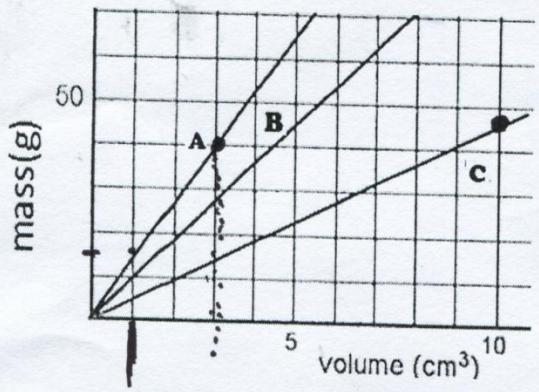
Write a "For every…" sentence for Substance A.

For every $\underline{1}$ cm^2 of A there are $\underline{15}$ $\underline{g}$

Using the definition of density as $density = \frac{mass}{volume}$ **calculate the density of substance A**

$$d = \frac{40g}{3mL}$$

$$d = 13.3$$

calculate the density of substance B

$$d = \frac{m}{v}$$

$$d = \frac{50g}{5.5 cm^3}$$

$$d = 9.09 \frac{g}{cm^3}$$

From the graph, find the mass of 10 mL of substance C

~~From the graph, find the volume of 10 grams of Substance C.~~

$\downarrow$ 46 mL.
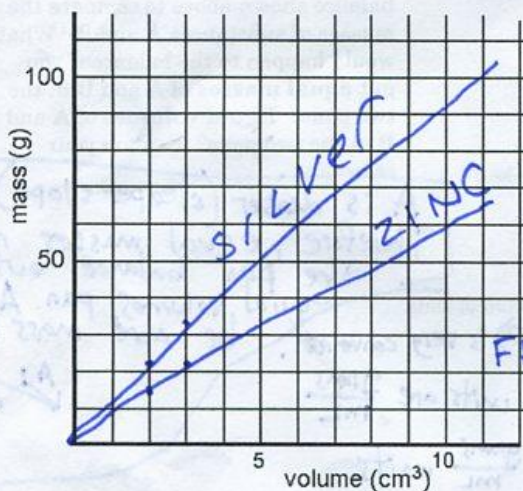
Name **ANSWERS**
Date
visit http:genest.weebly.com

Refer to the table of densities at the right to answer the following questions.

Substance	Density (g/mL)
Aluminum	2.70
Titanium	4.54
Zinc	7.13
Tin	7.31
Iron	7.87
Nickel	8.90
Copper	8.96
Silver	10.50
Lead	11.35
Mercury	13.55
Gold	19.30

1. Sketch a graph of mass vs. volume for zinc and silver.

FIRST MAKE A TABLE, then graph it.

ZINC

mass	vol
2	14.26
3	21.39

SILVER

mass	vol
2	21
3	31.5

2. You made a cube out of each metal in the table that each measures 12.00 cm on every side.

a. What is the volume of each cube in **cm³**? in **mL**? Show your thinking.

V = $\underline{1728}$ cm³   V = $\underline{1728}$ mL

$12_{cm} \times 12_{cm} \times 12_{cm} = 1728 \, cm^3$

b. Find the mass of gold: (Show your work below)

gold cube _____

① use gold density from table above.

② "For every 19.30 grams gold there are 1 mL of gold."

③ 1728 mL times $\dfrac{19.30 \, grams}{mL}$ = 33350.4 grams

3. In Figure 4 below, a graph shows the relationship between mass and volume for two substances, A and B. Use the graph to answer questions about these two substances.

Fig 4
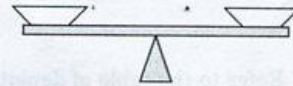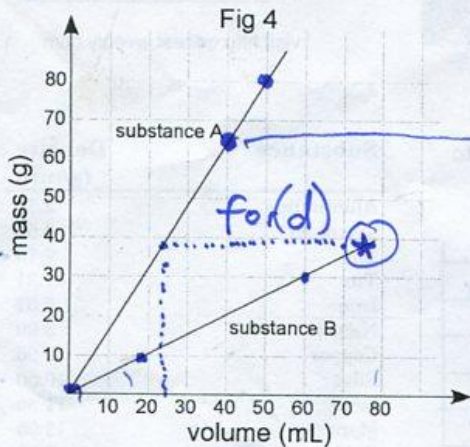
b) You have built a simple two-pan balance shown above to compare the masses of substances **A** and **B**. What would happen to the balance if you put **equal masses** of A and B in the two pans? **Equal volumes** of A and B in the two pans? Explain your reasoning.

A is denser (steeper slope).
Therefore, equal masses make the pan balance but equal volumes, pan A would be more mass: B A

b) Find the slope of the line for both A and B using correct units.

① Pick a pair of points. The point (0,0) is very convenient.

substance A: $\frac{80-0}{50-0} = \frac{8}{5} = 1.6$ slope units are $\frac{grams}{mL}$

B: $\frac{30-0}{60-0} = \frac{1}{2} = 0.5$ slope, $\frac{grams}{mL}$ units

c) Write a "For every…" sentence for each substance [See Wednesday's notes or look online at Wednesday's lecture]

For every 1.6 grams of Substance A there is 1 mL of volume.

~~For every 0.5 grams~~ For every 20 mL of Substance B there are 10 grams

c) If you put **40.0 mL of A** in one balance pan, what **mass of B** would you need in the other pan to make it balance? Explain your reasoning.

~~Use the graph~~

40.0 mL × (1.6 $\frac{g}{mL}$) = 64 grams of A

Therefore you need 64 g of B

d) If you put **77.0 mL of B** in one balance pan, what **volume of A** would you need in the other pan to make it balance? Explain your reasoning.

Use the graph…
The volume of A should be 24 mL