EUREKA!! I HAVE FOUND IT!

NAME AND CLASS PERIOD _____

Were you cheated?

It's class ring time. You want the best. Solid white gold. The ring salesman has to add on a price per ounce of gold and you have been told that your ring will have a specific weigh in ounces, pure gold. But when you get the ring, it just does not seem right. You weigh it and it is the correct weight but, your suspicion remains. You think its silver.

Your friend has 3 really "great" suggestions:

1. melt it to see if its solid gold
2. Scratch deep into it to see if it is solid gold
3. Be quiet and quit complaining.

WHAT CAN YOU DO TO DETERMINE IF YOUR RING IS GOLD OR SILVER WITHOUT MESSING UP THE RING?

Archimedes was faced with this same question in The THIRD CENTURY BC. Crime investigation began a long time ago. Only Archimedes wasn't dealing with a ring, he was dealing with a crown and a one angry king.

Turn to page 6 in your textbook.

****

What is the difference between "mass" and "volume"

Mass = _____

Volume =_____

Watch the demonstration and then answer questions 1-6 on pages 6 and 7.

1 _____

2_____

3_____

4_____

5_____

6_____

$$y = mx + b$$

m is _____ b is _____

$$y = 2x + 0$$

Slope = ____ y-intercept =____

<u>We are going to investigate some equations where the y intercept of the equation is zero.</u>

<u>If b = 0</u> , at what point does the graph touch the y axis? (,) this point is called the _____.

In Algebra II you may see these equations referred to as $\boldsymbol{y = kx}$ and is known as a <u>direct variation equations.</u> **k** is called the "constant of variation". k, is basically just another way of referring to slope. Slope has a lot of "names" such as:

Slope, constant of variation, _____

_____

- When "b" is zero, the equation is an equation that is **"proportionate**" or a "direct variation" where *y varies directly with x*. YOU MUST LEARN THIS!!!!
- If there is a "b" other than zero, the equation is not proportionate.
- Proportionate equations are the easiest to deal with. You just multiply the slope times the variable…no adding, or subtracting.

Compare $y = 3x$ to $y = 3x + 4$

x	y
2	
4	
6	

x	y
2	
4	
6	

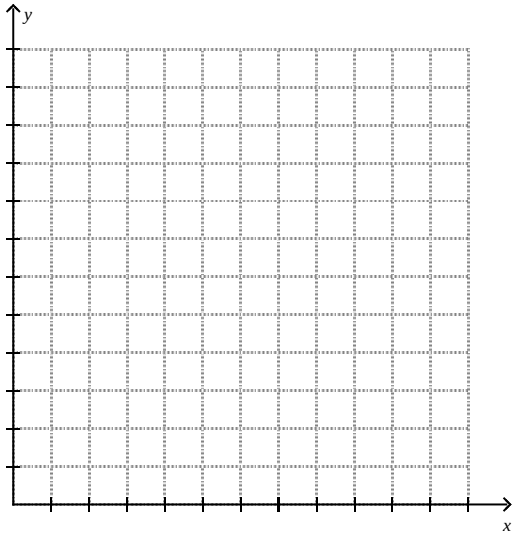
YOU PLAY ARCHIMEDES

- You will have 5 cylinders with weights to do the experiment. You will also have a water beaker with measurements marked.

Number of Cannisters	Volume of Water Dispaced	Volume of Water in Beaker
0		
1		
2		
3		
4		
5		

1. Put ____ pennies in each canister. That is enough to make them sink.
2. When you make a table of values, you should put the x values on which side, left or right? _____ On a sideways table, top or bottom?_____?
3. On the table, what would be your x? _____ Label it "X" and label your x axis on the graph. So_____ is "Y". Label it on the table and on the graph.
4. The third column is just there for information.
5. x is independent and y is dependent. Do you think the volume in the beaker depends on how many canisters you submerged?____ Or do you think that the number of canisters depends on the amount of water displaced?
6. Did we label it right?_____

In scatter plots, you do not connect the dots.



1. Count the number of units on the x axis.____
2. How many canisters must you show on the x axis? _____
3. What would be a good interval? _____units per canister. Label your canisters on the x axis.
4. Count the number of units on the y axis._____
5. What is the total water that was displaced? _____
6. What would be a good interval?_____ Label your water displacement on the y axis.

Plot your five points on your graph.
Why do you think you were told not connect the dots?_____
__

Definitions:
Discrete graph_____

Continuous graph_____

Now, find the slope "m" of each ordered pairs.
$m = \frac{y}{x} not \frac{x}{y}$ $\frac{rise}{run}$
_____, _____, _____, _____, _____

Was the slope the same for each ordered pair?_____

Should it be?_____ If it wasn't what could cause the problem?
_____

We determined this graph should be discrete because we are not submerging parts of a canister at any time, but we can write an equation that would work to predict the displacement of water by adding more canisters.

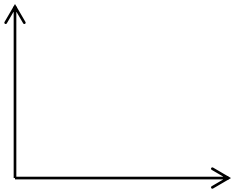
Find the average of your five slopes. That is your "m"____
What is your "b"----y-interrcept?" _____

Write your $y = mx + b$ y = _____or y = _____
Based on this, how much water would be displaced by submerging 8 canisters?_____
12 canisters?_____

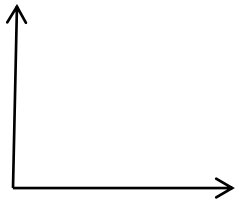
Is this a proportionate (direct variation)or non-proportionate graph?_____

Correlation:

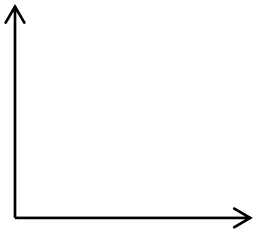
What does "correlation" mean?_____
Sketch a graph that would show:
1. Positive Correlation and give a situation that would produce a positive correlation and sketch a graph.
Example_____
__



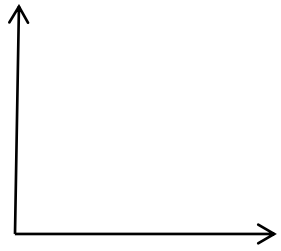
2. Do the same for a negative correlation.
Example _____



3. Do the same for a constant correlation.
Example_____



4. Do the same for no correlation
Example_____



5. For your graph on water displacement, what was the correlation of the points on the graph?_____