Name_____ Hour _____ Date _____

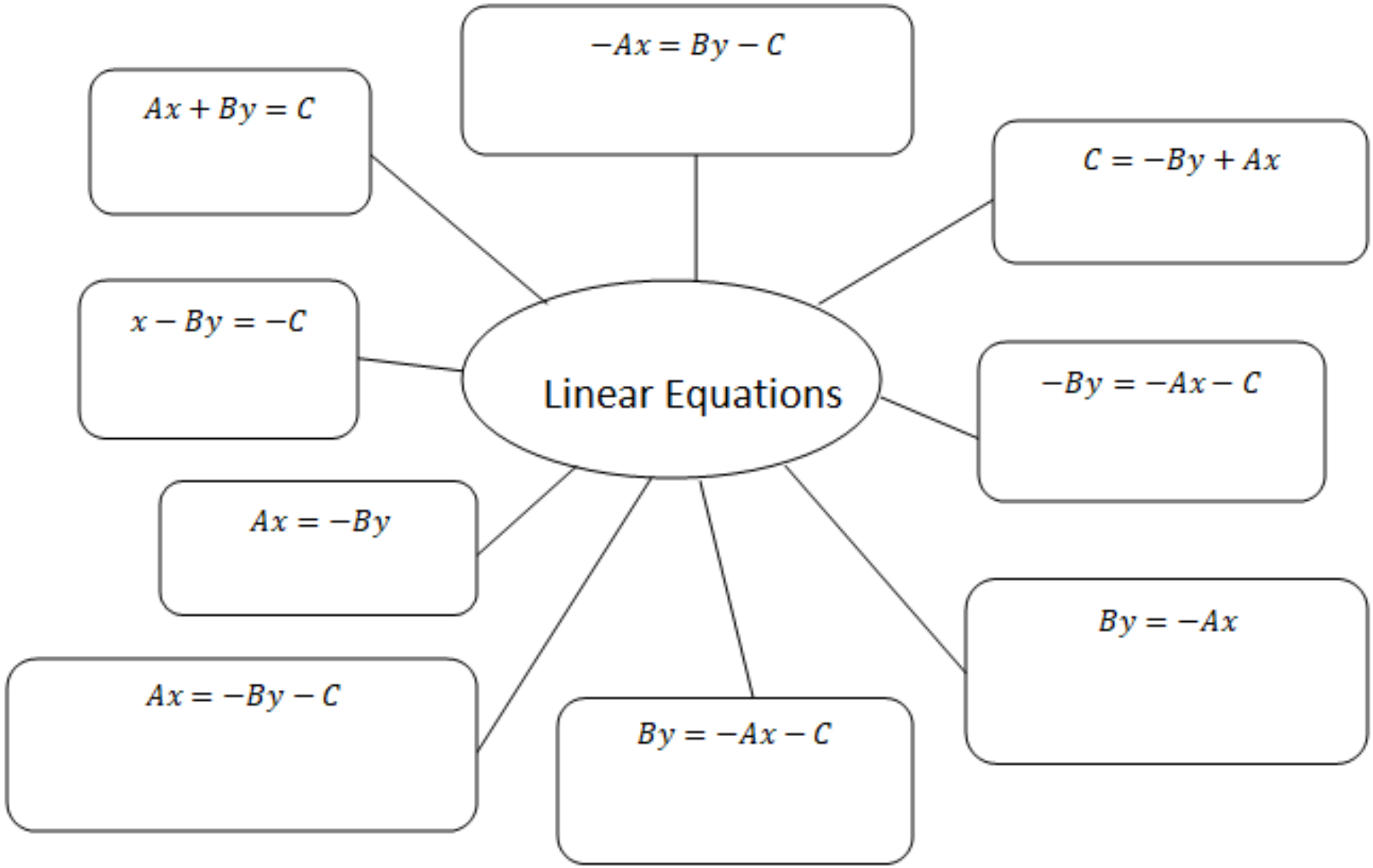
Day 1.

Objectives:

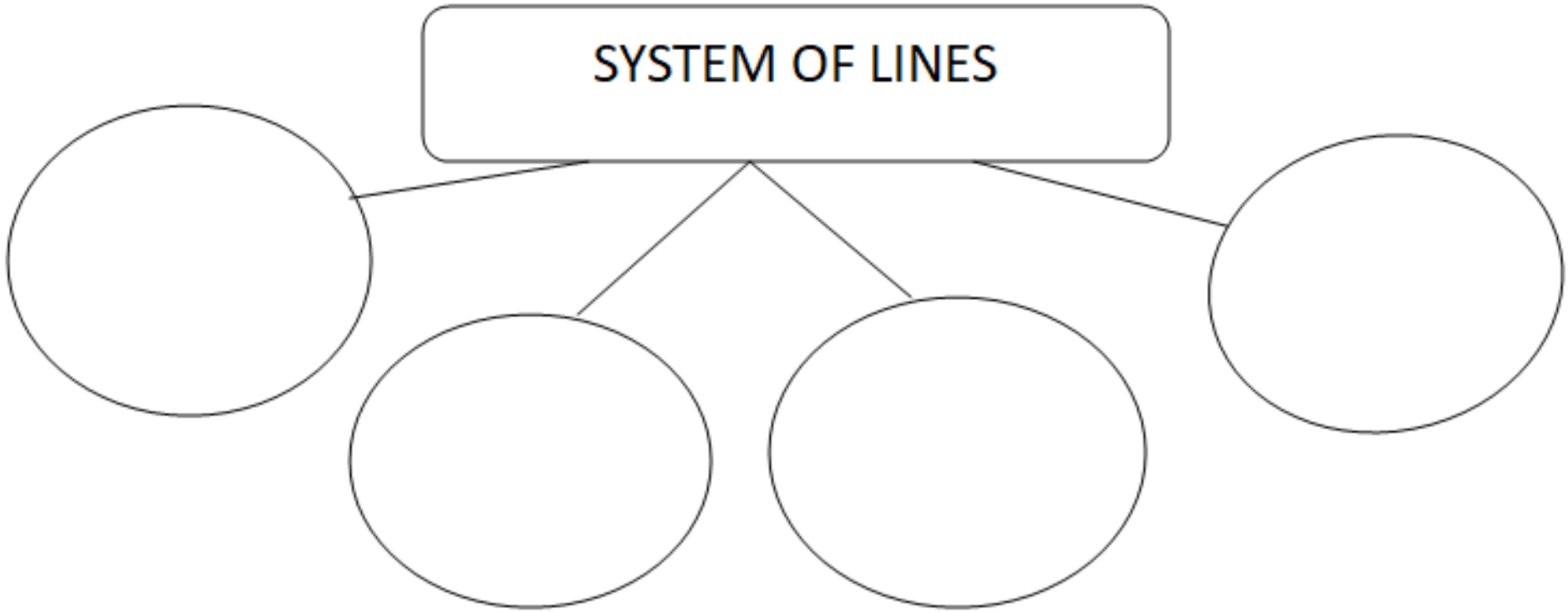
1. I will write linear equations in different forms.
2. I will write a system of lines

Activity. Work this out in pairs, then pair with another pair: $(pair)^2$

1. Fill out the following shapes with linear equations that are in the given form. Use your own values of $a, b, and\ c$. No one should have the same equation at all.
2. Then rewrite your equation in $y = mx + b$


Linear Equations
$-Ax = By - C$
$Ax + By = C$
$C = -By + Ax$
$x - By = -C$
$-By = -Ax - C$
$Ax = -By$
$By = -Ax$
$Ax = -By - C$
$By = -Ax - C$

3. Combine any 2 or 3 of the equations you created above in one bubble. Use the form $y = mx + b$. For example, write your equation in rectangular shape 1 and your equation in rectangular shape 2 in each of the bubble below. There should be 4 pairs of linear equations.



Name_____ Hour _____ Date _____

Day 2.

Objectives:

1. I will graph a system of lines using $y = mx + b$.
2. I will determine the solution of a system of line using the graph.

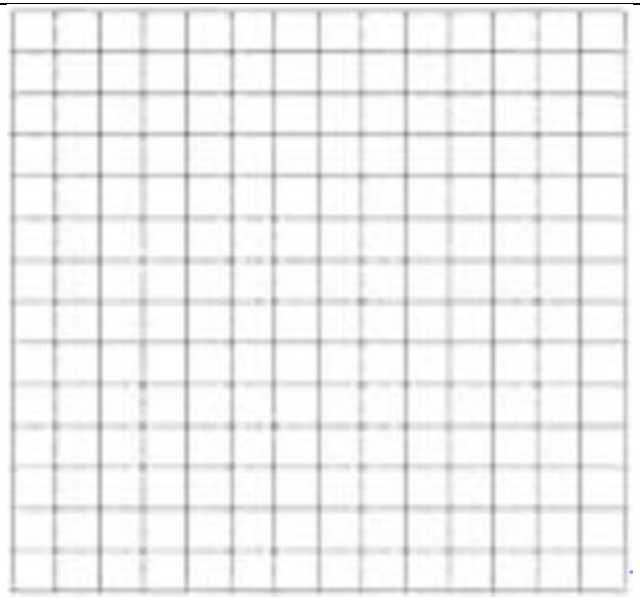
Use your data in Day 1 to complete this part. Work this out in pairs, then pair with another pair to check if you are doing it right: $(pair)^2$.

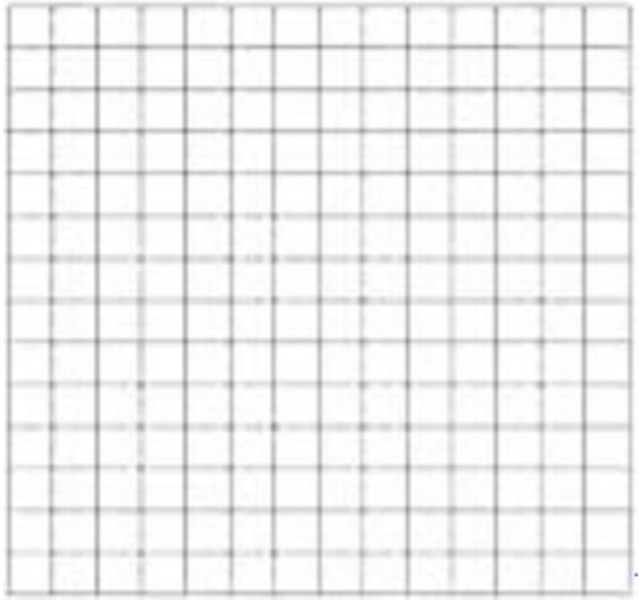
How to graph a line using $y = mx + b$

- First, determine the $y\ intercept\ (b)$ from your equation, then indicate the point on the graph.
- Then, determine the $slope\ (m)$ from your equation.
- Move from the $y\ intercept$ UP or DOWN (depending on the sign of the numerator) on the slope
- Then, move RIGHT or LEFT (depending on the sign of the denominator) on the slope
- Connect the 1st point and the 3rd point. You now have the graph of a line.

4. Graph each pair in one coordinate plane. These are called system of lines.

a. 

b. 

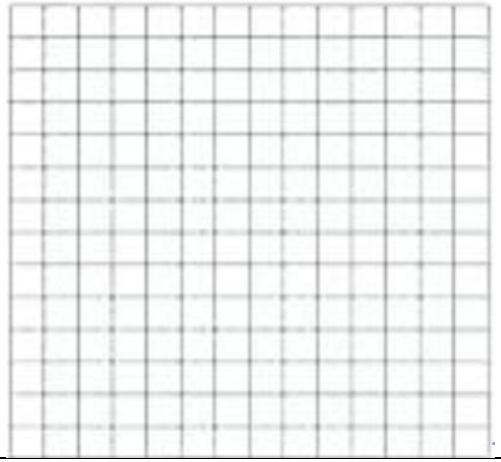
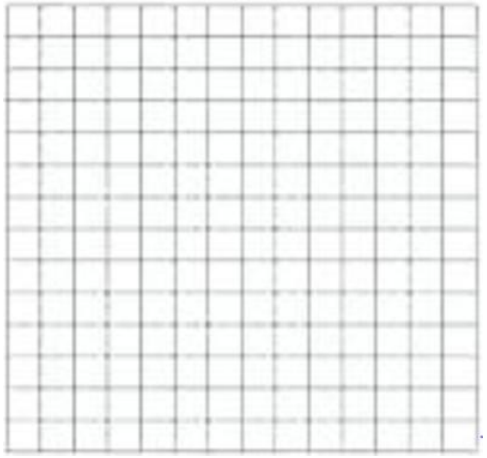
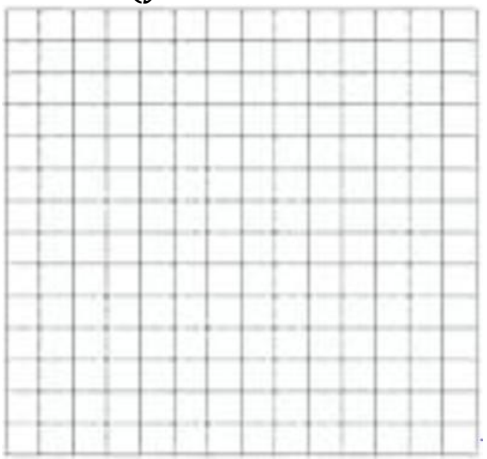
c. 

d. 

5. Determine for each system you created in the previous days:
    a. is there a point of intersection? If yes, fill out the coordinates: (_____, _____)
    b. use your coordinate to substitute each x and y. Put your solutions in the box.

c. Does it make both equations in each system TRUE? _____.

6. If your answer is YES, then the coordinate of the intersection is the SOLUTION OF THE LINEAR system.

Determine the solution of the system of lines by graphing:	
1. $\begin{cases} x = 2 \\ y = -2 \end{cases}$ 	2. $\begin{cases} x = -1 \\ y = 4 \end{cases}$ 
3. $\begin{cases} y = -1 \\ y = 3x - 1 \end{cases}$ 	4. $\begin{cases} y = 2x \\ y = -x \end{cases}$ 

7. Indicate on the graph if there is one solution, NO solution, or there are INFINITE SOLUTIONS in each of the system you created. Check the type of linear system you created using the following guides:
    a. System with ONE solution
        - the lines intersect or cross each other at **exactly one point**
    b. System with NO SOLUTION
        - the lines will **never intersect**.
        - **The lines are parallel**.
        - ➢ Both lines have the **same slope**

        $(both\ slopes, m\ can\ be\ positive\ or\ both\ slopes, m\ can\ be\ negative)$
        - ➢ Both can be **horizontal** $(m = 0)$
        - ➢ Both can be **vertical** $(m\ is\ undefined)$
    c. System with INFINITE OR MANY SOLUTIONS
        - The system of lines is exactly on the **same spot**.
        - They have the **same slope**
        - Their **equations are equivalent**

Name_____ Hour _____ Date _____

DAY 3.

Objective:

- I will determine the solution of a linear system using algebra solutions.
  - **Substitution; substitution**

I. Solving system of lines by **substitution** using simple equations containing one variable and 2 variables. $(y = x; y = -3x;\ y = 4; y = -2)$

Watch these:

a. https://youtu.be/xzuouSZ69XU?t=33

b.

Practice: what is the solution of the system of lines? Show solutions and write the coordinates in the appropriate form (x, y)

1. $\begin{cases} x + y = 4 \\ y = 3x \end{cases}$	2. $\begin{cases} 2x - 3y = -13 \\ y = 2x + 7 \end{cases}$

3. $\begin{matrix} y = x + 5 \\ y = -x + 3 \end{matrix}$	4. $\begin{cases} 2x + 3y = 11 \\ x - 4y = 0 \end{cases}$
5. $\begin{cases} y = 3x - 4 \\ 2x + y = 1 \end{cases}$	6. $\begin{cases} Y = -x - 1 \\ 4x - 3y = 24 \end{cases}$

II. Solving system of lines by **substitution using equations containing 2 variables in the form $ax + by + c = 0$** and its other forms

Watch these:

a. https://youtu.be/Pou45LvlM3g?t=11
b. https://youtu.be/ZSJ32Bq9sbQ?t=1
c. https://youtu.be/JWfn2E1XPkc?t=11
d. https://youtu.be/47Od4Nww_fw?t=38

PRACTICE

1. $\begin{cases} 2x + 3y = 11 \\ x - 4y = 0 \end{cases}$	2. $\begin{cases} x + y = 2 \\ x - y = 4 \end{cases}$

3. $\begin{cases} x+3y=5 \\ 4x+5y=13 \end{cases}$	4. $\begin{cases} x+y=1 \\ x-y=3 \end{cases}$
5. $\begin{cases} 2x-7y=2 \\ 3x+7y=-20 \end{cases}$	6. $\begin{cases} -4x+y=-11 \\ 2x-3y=5 \end{cases}$

Name_____ Hour _____ Date _____

Day 4

Objective:

- I will determine the solution of a linear system using algebra solutions.

➢ **Elimination; substitution**

Watch these:

a. https://youtu.be/cMA_2Lk2K5M?t=3
b. https://youtu.be/jG1EZoRS_Fs?t=19
c. https://youtu.be/d6vyYvx8URw?t=12

PRACTICE:

1. $\begin{cases} x + y = 1 \\ x - y = 3 \end{cases}$	2. $\begin{cases} 3x + 2y = 14 \\ 3x - 2y = 10 \end{cases}$

3. $\begin{cases} x+y=1 \\ -x+y=3 \end{cases}$	4. $\begin{cases} 2x-7y=2 \\ 3x+y=-20 \end{cases}$
5. $\begin{cases} 3x-2y=-5 \\ 4x+y=8 \end{cases}$	6. $\begin{cases} 2x+5y=-4 \\ 3x-y=11 \end{cases}$

7. $\begin{cases} 2x + 3y = -16 \\ 5x - 10y = 30 \end{cases}$	8. $\begin{cases} x + 3y = 5 \\ 4x + 5y = 13 \end{cases}$
9. $\begin{cases} 2x - 3y = 6 \\ 4x + 3y = 12 \end{cases}$	10. $\begin{cases} -4x + 2y = -11 \\ 2x - 3y = 5 \end{cases}$

Name_____ Hour _____ Date _____

Day 5.

Objectives:

I will determine the appropriate way of finding the solution to the following linear systems.

1. $\begin{cases} 2x + 5y = -4 \\ 3x - y = 11 \end{cases}$	2. $\begin{cases} x + 3y = 2 \\ 3x + 9y = 6 \end{cases}$
3. $\begin{cases} 4x - 2y = 2 \\ 2x - y = 1 \end{cases}$	4. $\begin{cases} x + y = 1 \\ -x + y = 3 \end{cases}$

5. $\begin{matrix} x = 9 - 2y \\ x + 2y = 13 \end{matrix}$	6. $\begin{cases} 6x + 2y = 7 \\ y = 2 - 3x \end{cases}$