NAME _____ PERIOD _____ DATE _____

System of Linear Equations 1_3: *Intersecting Lines*

At a school band concert, Christopher and Celine sell memberships for the band's booster club. An adult membership costs $10, and a student membership costs $5. At the end of the evening, the students had sold 50 memberships for a total of $400. The club president asked,

- How many of the new members are adults and how many are students?

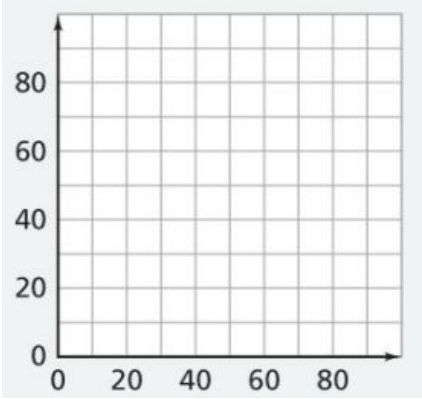
A Let a represent the number of $10 adult memberships and s represent the number of $5 student memberships.

1. What equation relates a and s to the $400 income total? Explain what each term of the equation represents.
2. Find three solutions for your equation from part (1).
3. What equation relates a and s to the total of 50 new members? Explain what each term of the equation represents.
4. Find three solutions for your equation from part (3).
5. Are there any pairs of values for a and s that satisfy both equations?

B

1. Graph the two equations from Question A on a grid like the one at the right. Does it matter which variable goes on which axis? Explain.
2. Determine the coordinates of the intersection point. Explain what the coordinates tell you about the numbers of adult and student memberships sold.

Both lines go on the same graph!

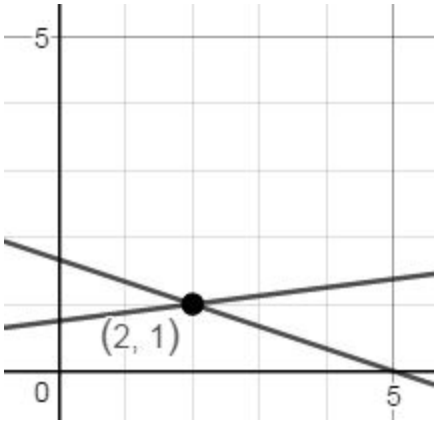


3. Could there be a **common solution** for the two equations that is ***not*** shown on your graph?

Klarke Math 8th Grade

NAME _____ PERIOD _____ DATE _____

The two equations you wrote to model the conditions of this Problem are called a **system of linear equations.** The coordinates of the intersection point satisfy both equations. These coordinates are the **solution of the system.**



(2, 1) is the **solution** of the equations

$$2x + 6y = 10$$

$$-x + 8y = 6$$

C Use graphic or symbolic methods to solve each system of linear equations. Check your answer.

1. $x + y = 4$ and $x - y = -2$

2. $2x + y = -1$ and $x - 2y = 7$

3. $-2x + y = 3$ and $-4x + 2y = 6$

4. $-2x + y = 3$ and $-4x + 2y = 10$