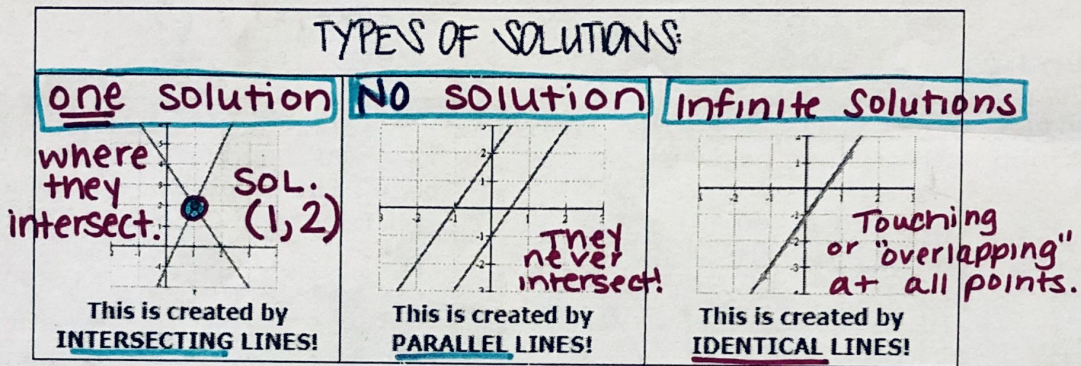


Solving System of Equations by Graphing

What is a system of equations?!

A system of equations is when you have 2 or more equations using the same variables!

- The Solution to the system is the point that satisfies ALL of the equations! (The solution is written as an ordered pair!)
- When graphing, you will encounter 3 possibilities!



How to SOLVE a System of Equations by GRAPHING!

There are **2 steps** to solving a system using a graph.

Step 1: Graph both equations.

Graph using the calculator & table. Be sure your equations are in slope-intercept form! $y = mx + b$

Step 2: Do the lines intersect?

This is the solution! LABEL it by circling it and writing the coordinate.

③ *check by plugging in to both equations.

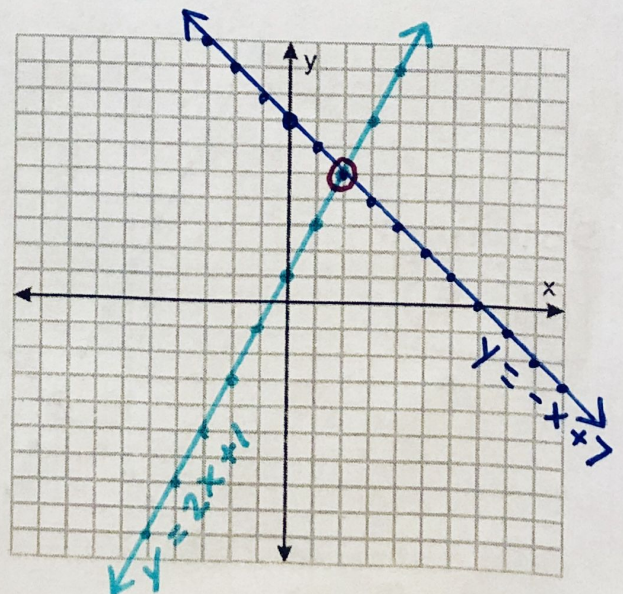
Let's Try It!

Solve the following system of equations graphically.

$y = 2x + 1 \rightarrow m = \frac{2}{1} \quad b = 1$

$y = -x + 7 \rightarrow m = -\frac{1}{1} \quad b = 7$

Solution: (2, 5)



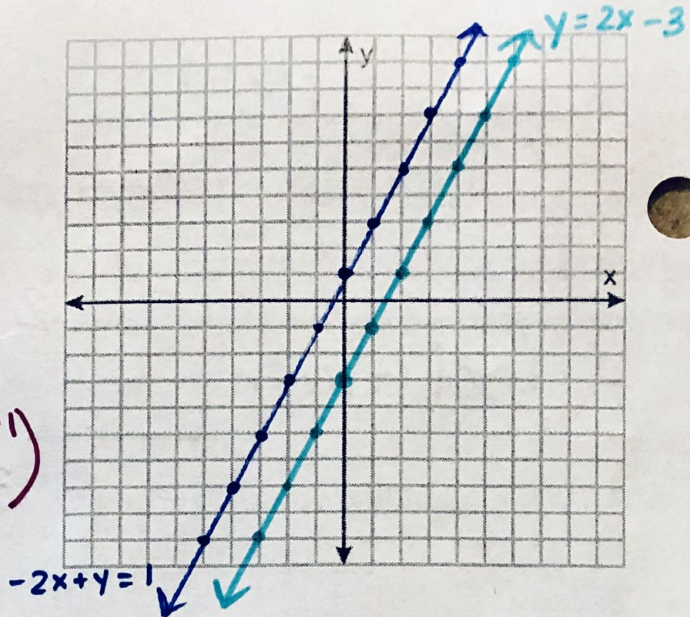
One More...

$$y = 2x - 3 \rightarrow m = \frac{2}{1} \quad b = -3$$

$$\begin{array}{r} -2x + y = 1 \\ \xrightarrow{\text{Solve for } y} \\ \underline{+2x} \quad \underline{+2x} \end{array}$$

$$y = 2x + 1 \rightarrow m = \frac{2}{1} \quad b = 1$$

No Solution (because parallel lines never intersect!)

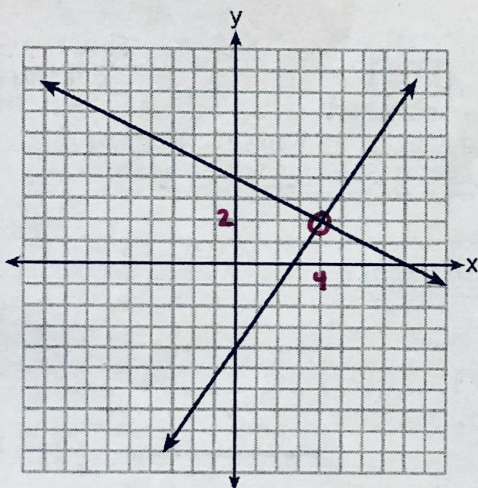


It's your turn! ☺

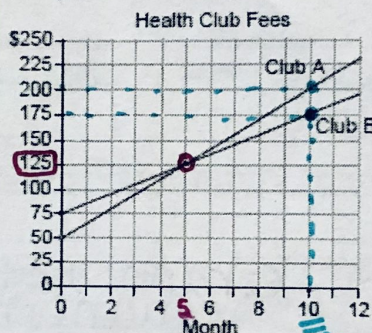
Regents Style! ~ These are problems from previous years Regents Exam!

1. The solution to the system below is...

- a) (0, 4)
- b) (2, 4)
- c) (4, 2)**
- d) (8, 0)



2. Two health clubs offer different membership plans. The graph below represents the cost of belonging to Club A and Club B for one year.



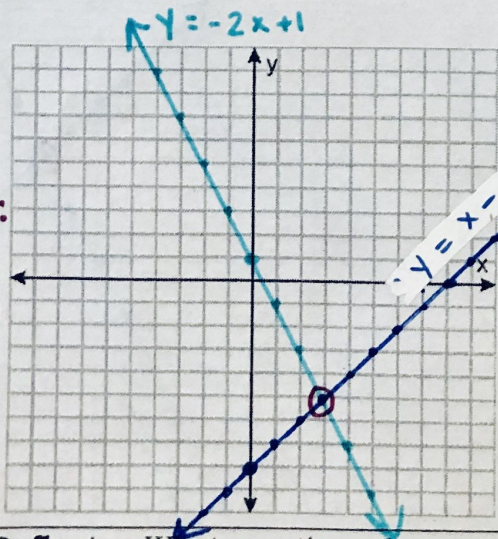
What is the number of the month when the total cost is the same for both clubs?
What is the cost?
5th month for \$125.

Which club is cheaper after 10 months? **Club B**

Graphing Practice! Graph each equation to find the solution! Write the solution as an ordered pair!

3. $\begin{cases} y = x - 8 \\ y = -2x + 1 \end{cases} \rightarrow m = \frac{1}{1} \quad b = -8$
 $\rightarrow m = \frac{-2}{1} \quad b = 1$

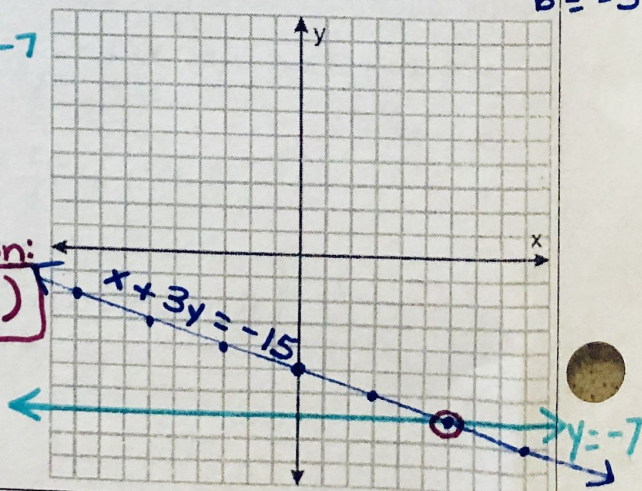
Solution:
(3, -5)



4. $\begin{cases} x + 3y = -15 \\ y = -7 \end{cases} \rightarrow \frac{-x}{-3} + 3y = \frac{-15}{-3}$
 $\frac{3y}{3} = \frac{-x}{3} - \frac{15}{3}$
 $y = -\frac{1}{3}x - 5$
 $m = \frac{-1}{3}$
 $b = -5$

HOY
horizontal
line at
 $y = -7$

Solution:
(6, -7)



Self-Reflect... What questions do you have or what do you need more help with?