Section 5.1 Notes (Day 1):
Solving a System of Linear Equations by Graphing

Key Vocabulary

System of Linear Equations

* two or more linear equations in the same variable

Ex) $y = 2x+1$
$y = -x+4$

Solution of a System of Linear Equations

* is the ordered pair that is a solution to each of the equations in the system
→ when graphed, it is the point of intersection

Key Idea

Solving a System of Linear Equations by Graphing

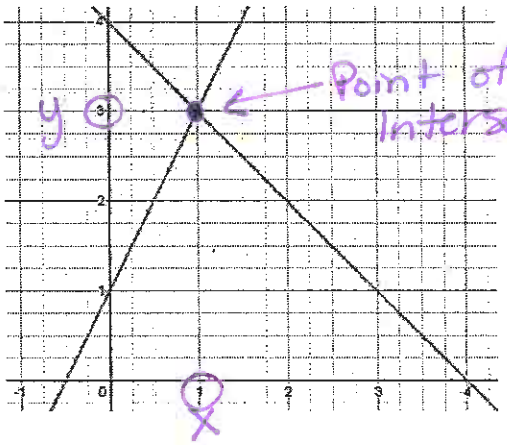
- Step 1: Graph the linear functions on the same coordinate plane
- Step 2: Locate/ Estimate the point of intersection
- Step 3: Check the solution (point of intersection) in both equations to make sure it actually works

Example 1:

What is the solution to the following system of linear equations given the graph below?

$y = 2x + 1$

$y = -x + 4$



Solution: (1,3)

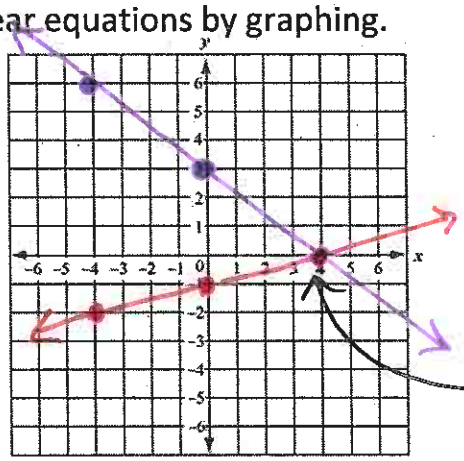
Example 2:

Solve the system of linear equations by graphing.

$y = -\frac{3}{4}x + 3$

$y = \frac{1}{4}x - 1$

$y = mx + b$ (m: slope, b: y-int)



Point of intersection

Solution: (4,0)

Check for $y = -\frac{3}{4}x + 3$

$0 = -\frac{3}{4}(4) + 3$

$0 = -3 + 3$

$0 = 0$ ✓

Check for $y = \frac{1}{4}x - 1$

$0 = \frac{1}{4}(4) - 1$

$0 = 1 - 1$

$0 = 0$ ✓

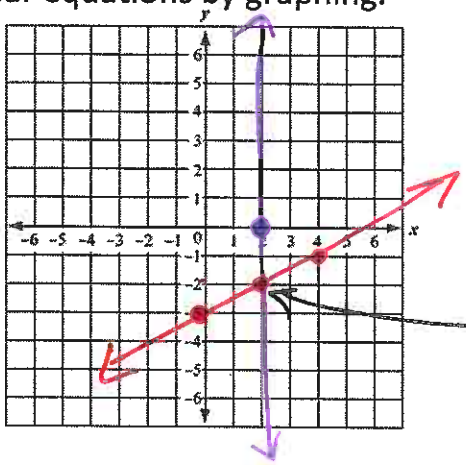
(Note: Since (4,0) worked in both equations to create a balanced statement at the end, we know that (4,0) is the correct solution)

Example 3

Solve the system of linear equations by graphing.

$x = 2$

$y = \frac{1}{2}x - 3$



Solution: $(2, -2)$

Point of Intersection

Check for $x = 2$

$2 = 2$ ✓

Check for $y = \frac{1}{2}x - 3$

$-2 = \frac{1}{2}(2) - 3$

$-2 = 1 - 3$

$-2 = -3$ ✓

We know that $\boxed{(2, -2)}$ is the correct solution