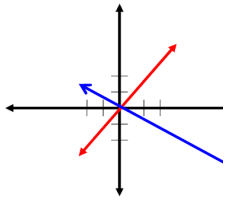
Chapter 7 Systems of Linear Equations



↳ Sec 7.1 to 7.6

Section 7.1, Section 7.2 and Section 7.6

Recall: Solve $3x - 1 = 11$

To solve means to find the value of x that satisfies the equation.

Think About this!

↳ What does it mean to solve $2x + 3y = 3$?

↳ How can we solve the equation $2x + 3y = 3$?

Note:

The only way to solve a linear equation with two variables is to have two equations!

Therefore, we need a **system of linear equations** or a **linear system**.

Example 1: Developing a system of equations

St. John's has two bus sizes for renting Charter buses,
a small bus, S, and a large bus, L.

a) Write an equation to represent there are 20 more small buses than large buses.

b) Write an equation to represent that the small bus can carry 12 passengers and the large bus can carry 24 passengers. In total 780 people can travel by bus.

c) Write the system of linear equations.

Note: The solution to this linear system is a point (S, L), that satisfies both equations.

d) Is (35, 15) a solution? What does this mean?

In this question you verified a given solution, or point. However, you need to know how to find the solution yourself. How???

The solution to a linear system is the point (x,y) where the two lines intersect.

There are three ways to find the solution:

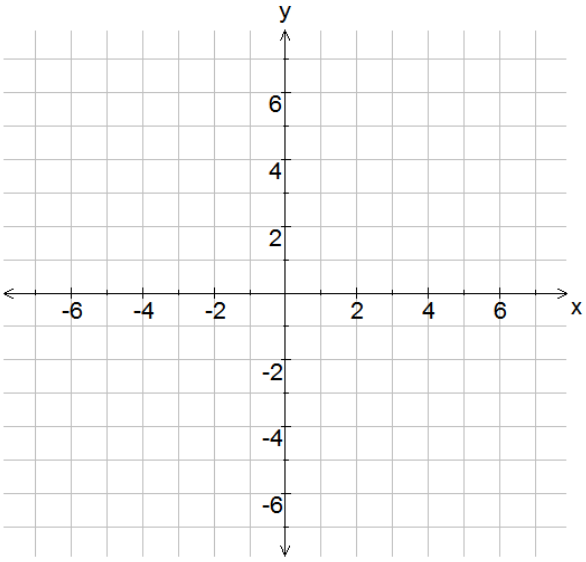
1) Graph the lines 2) Elimination 3) Substitution

#1: Solving a Linear System by Graphing

Example 2: Solve by graphing.

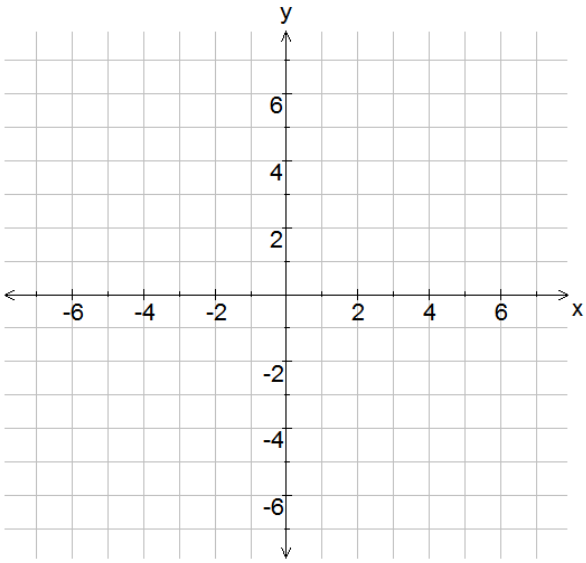
a) $y = 2x + 1$

$y = \frac{-3}{2}x - 6$



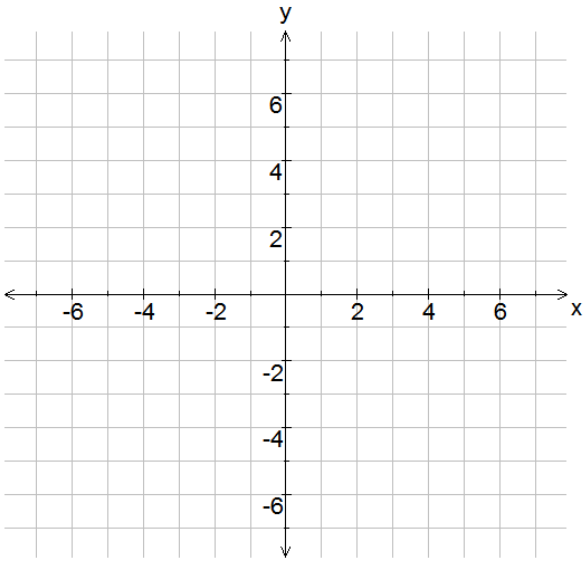
b) $2x + 3y = 3$

$x - y = 4$



c) $y = 2x - 2$

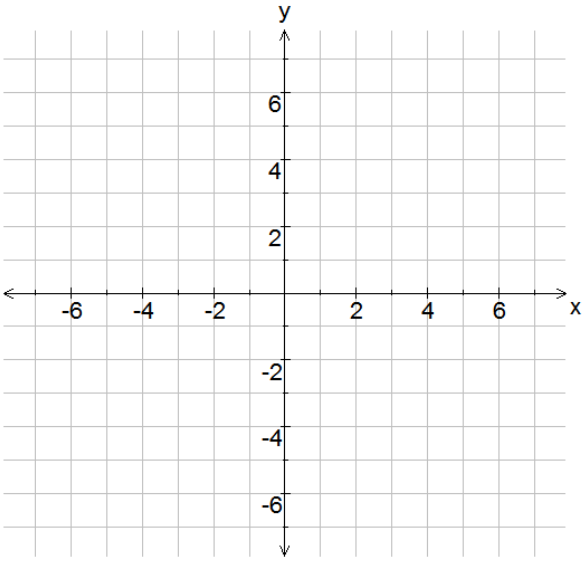
$-4x + 2y = 8$



What do you notice?

d) $2y = 4x - 2$

$y - 2x + 1 = 0$



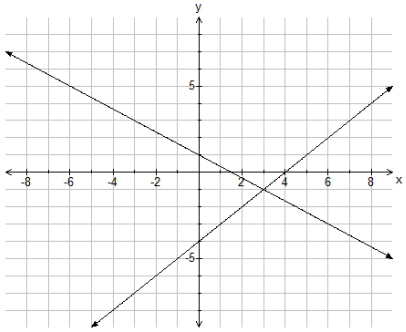
What do you notice?

Summary When solving by graphing there are 3 possibilities:

1. **Intersecting Lines**

↳ will have ONE solution.

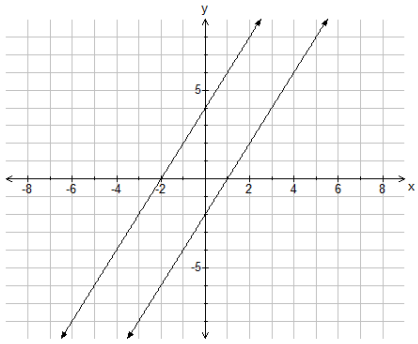
↳ will have different slopes.



2. **Parallel Lines**

↳ will have NO solution.

↳ will have the same slope but a different y-intercept.

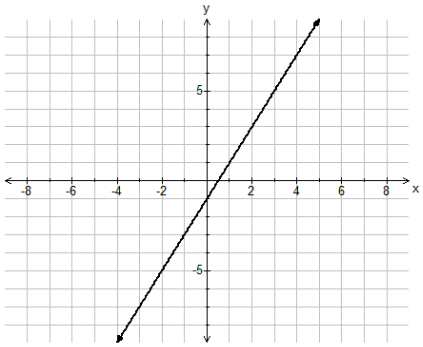


3. **Coincident Lines**

↳ will have INFINITE solutions.

↳ will have the same slope and the same y-intercept.

↳ equations are related by multiplying or dividing by the same number



Work Book Questions	Extra Practice Questions
Sec 7.1: p.401 #4, 5ac, 6abc	Sec 7.1: p.401 #5b, 8ab
Sec 7.2: p.408 #3ab, 5a(i)(ii), 7ab	Sec 7.2: p.408 #3cd, 4ab 5a(iii) (iv), 6
Sec 7.6: p.448 #4a(i)(ii)(iii)(iv) bc , 5ab, 7abc, 10, 11	Sec 7.6: p.448 #6abc, 9abc, 19a, 20a, 22a (i)(ii)(iii)