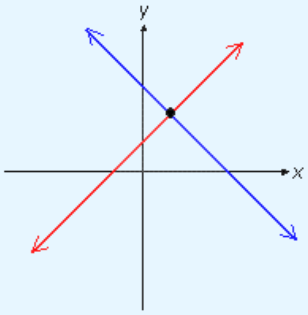
MAC 1105 Pre-Class Assignment (due 6/12 by 11:59pm):

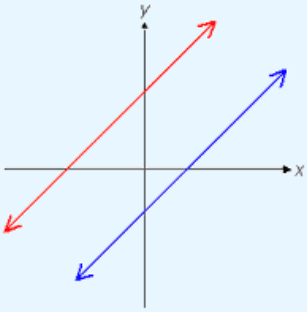
Systems of Equations

A **system of equations** is a collection of two or more **equations** with a same set of unknowns. In solving a **system of equations**, we try to find values for each of the unknowns that will satisfy every **equation** in the **system**. The **equations** in the **system** can be linear or non-linear.

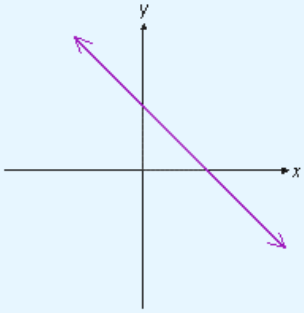
Solutions to a System of Linear Equations in Two Variables



The two graphs above intersect at a single point. This point (x, y) is the solution to the system.

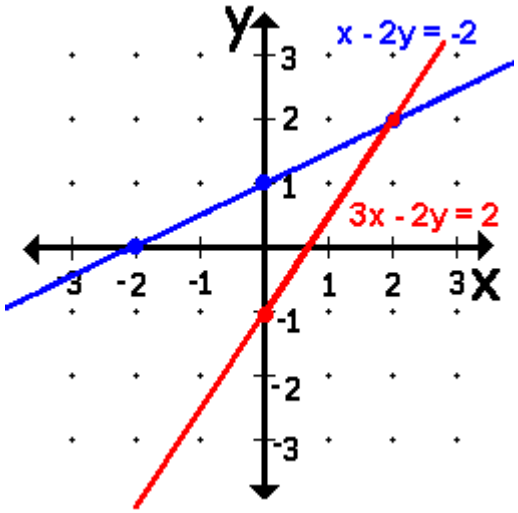


The two graphs above are parallel and therefore they never intersect. Since there is no point of intersection, there is no solution (∅).



The two graphs above are coinciding lines. Since they represent the same line, they intersect everywhere. So every point along the line is a solution to this system.

In the figure below, the solution to the system of equations is the point of intersection of the two lines.



- **Solve the following system by substitution.**

$$2x - 3y = -2$$
$$4x + \ y = 24$$

The idea here is to solve one of the equations for one of the variables, and plug this into the other equation. For instance, in this case, can you see that it would probably be simplest to solve the second equation for "*y* =". Show that first step below:

Now you can substitute what "*y*" is equal to into the first equation and solve for *x*. Show this below:

Now plug this *x*-value back into either equation, and solve for *y*.

What is the point of intersection of these two lines?