Notes #13 ~ Sect. 3.1: Graphing Systems of Equations

A system of equations is a set of two or more equations that use the same variables.

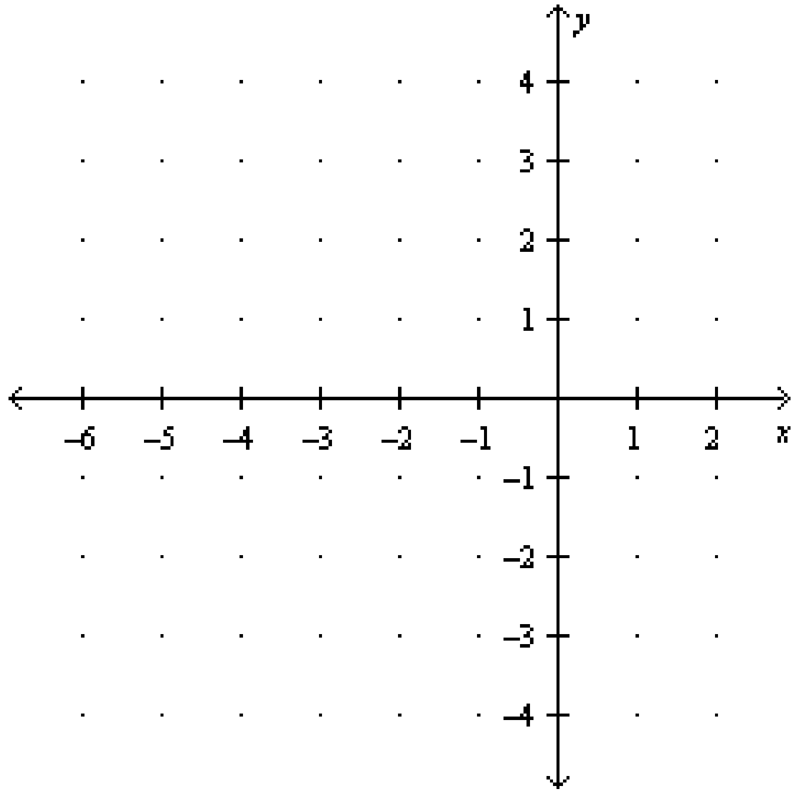
A brace is used to keep the equations of a system together.

$$\begin{cases} y = x + 3 \\ y = -2x + 3 \end{cases}$$

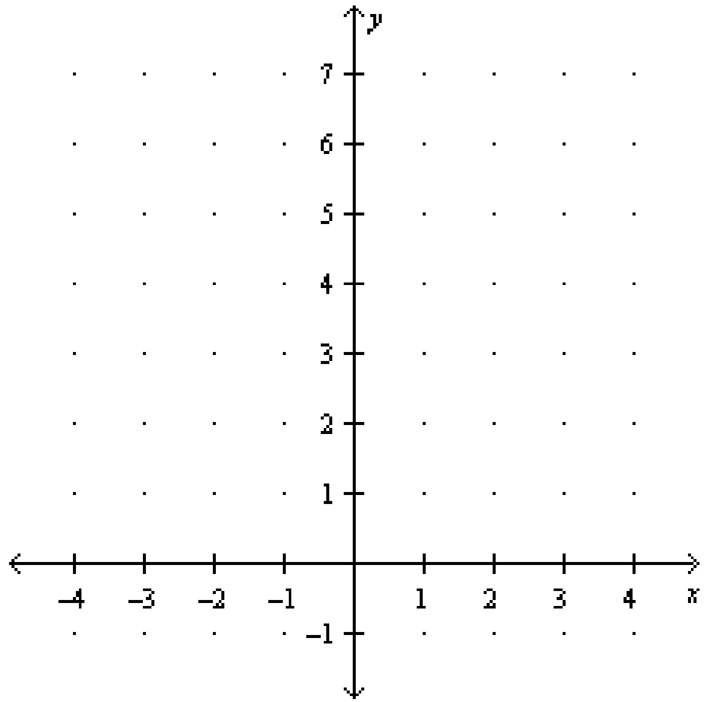
A solution of a system of equations is a set of values for the variables that makes all the equations true. The points where both (or all) the graphs intersect represents solutions.

Ex. 1 : Solve each system by graphing.

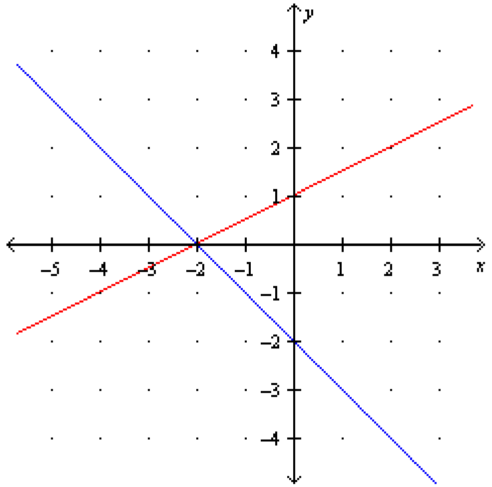
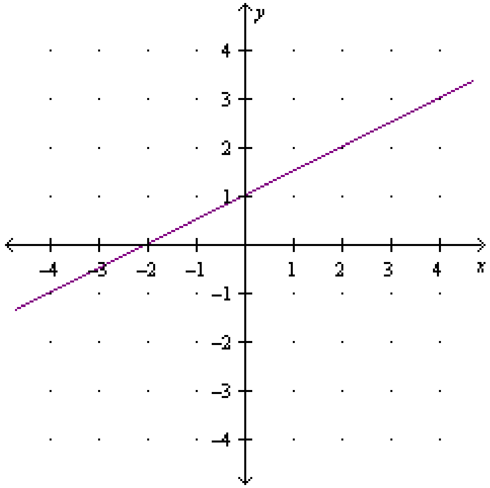
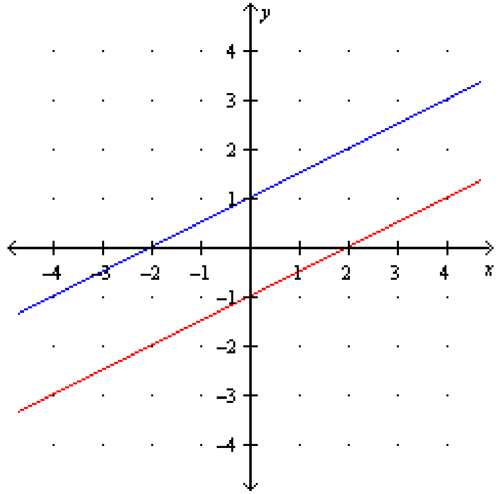
a) $$\begin{cases} x + 3y = 2 \\ 3x + 3y = -6 \end{cases}$$



b) $\begin{cases} 2x + y = 5 \\ -x + y = 2 \end{cases}$



You can classify a system of two linear equations by the number of solutions.

Intersecting Lines	Coinciding Lines	Parallel Lines
		
one solution Independent	no unique solution Dependent	no solution Inconsistent

You can also classify a system without graphing. By comparing the slopes and y-intercepts of the equations, you can find the number of solutions.

Intersecting Lines	Coinciding Lines	Parallel Lines
Independent	Dependent	Inconsistent
different slopes	same slope same y-intercept	same slope different y-intercepts

Ex. 2 : Without graphing, classify each system as independent, dependent, or inconsistent.

a) $\begin{cases} 3x + y = 5 \\ 15x + 5y = 2 \end{cases}$

b) $\begin{cases} y = 2x + 3 \\ -4x + 2y = 6 \end{cases}$

c) $\begin{cases} x - y = 5 \\ y + 3 = 2x \end{cases}$