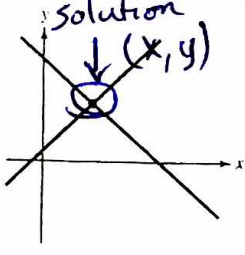
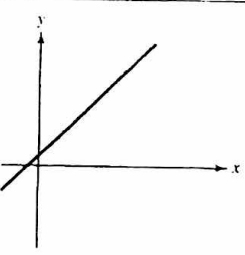
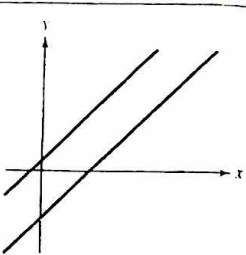


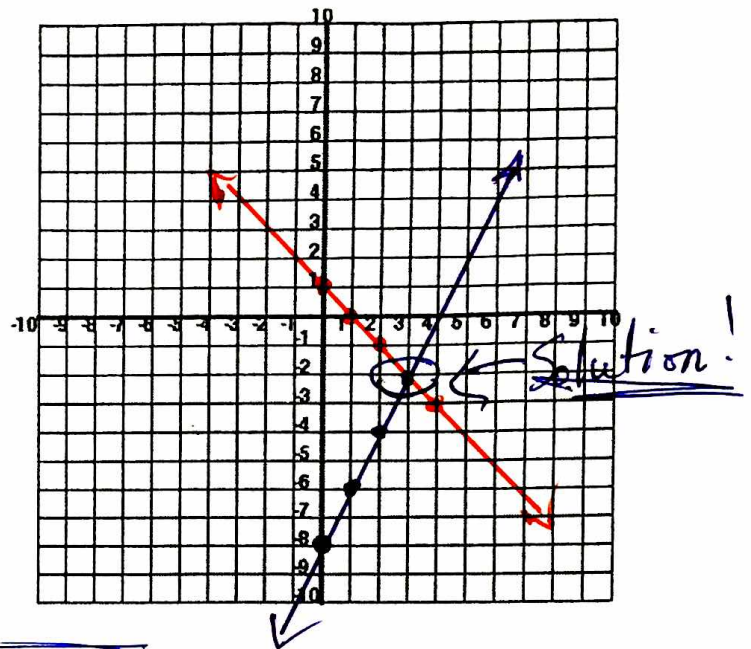
SOLVING SYSTEMS OF EQUATIONS BY GRAPHING

- A **SYSTEM** of linear equations is two or more linear equations.
- A **SOLUTION** to a system is an ordered pair that satisfies both equations.

Graphs			
Graphical Interpretation	The two lines intersect.	The two lines coincide (are identical).	The two lines are parallel.
Intersection	Single point of intersection	Infinitely many points of intersection	No point of intersection
Slopes of Lines	Slopes are not equal.	Slopes are equal.	Slopes are equal.
Number of Solutions	Exactly one solution	Infinitely many solutions	No solution
Algebraic	(x, y)	$0 = 0$	$0 = \#$

Standard Slope-Intercept

$$2x - y = 8 \quad \left\{ \begin{array}{l} y = 2x - 8 \\ y = -x + 1 \end{array} \right.$$



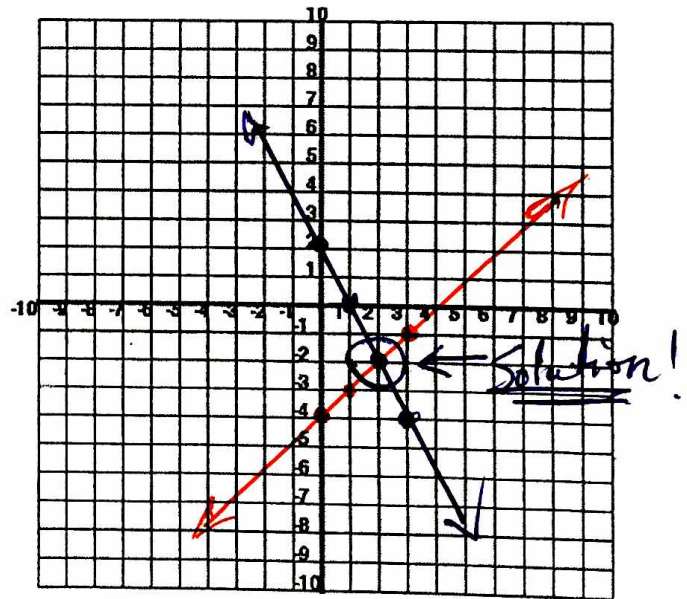
$$\begin{array}{r} 2x - y = 8 \\ -2x = -2x \\ \hline y = -2x + 8 \end{array}$$

Solution: (3, -2)

$$\begin{array}{r} x + y = 1 \\ -x = -x \\ \hline y = -x + 1 \end{array}$$

Standard Slope-Intercept

$$2x + y = 2 \quad \left\{ \begin{array}{l} y = -2x + 2 \\ y = x - 4 \end{array} \right.$$



$$\begin{array}{r} 2x + y = 2 \\ -2x = -2x \\ \hline y = -2x + 2 \end{array}$$

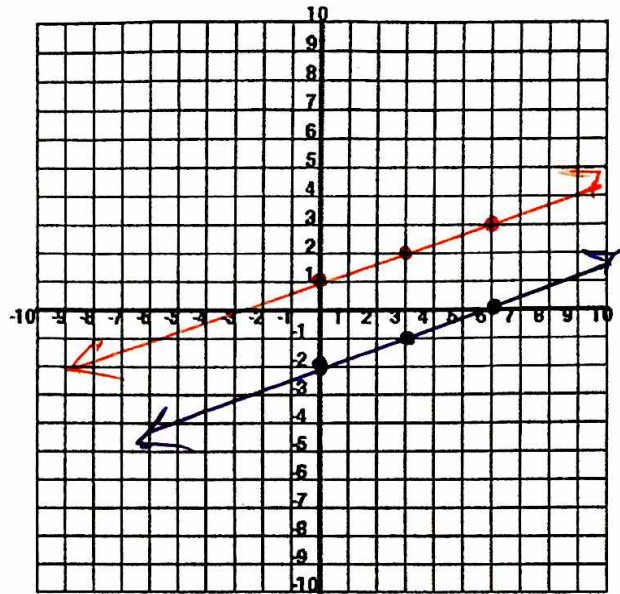
Solution: (2, -2)

$$\begin{array}{r} x - y = 4 \\ -x = -x \\ \hline y = x - 4 \end{array}$$

Standard Slope-Intercept

$$x - 3y = 6 \quad \left| \quad y = \frac{1}{3}x - 2 \right.$$

$$x - 3y = -3 \quad \left| \quad y = \frac{1}{3}x + 1 \right.$$



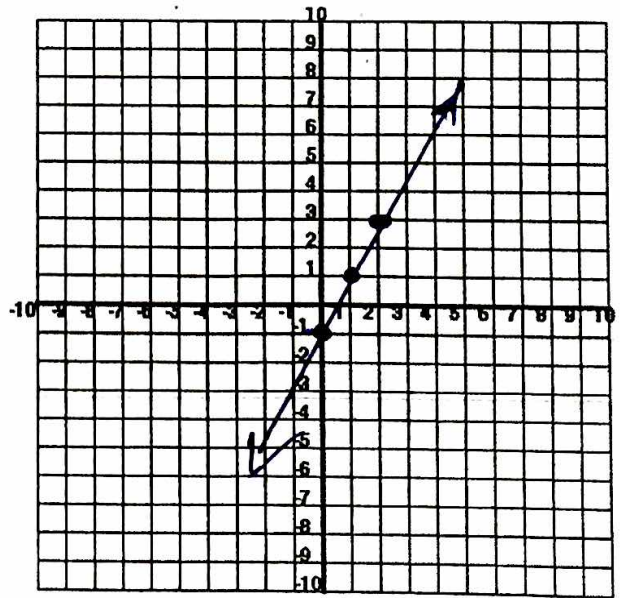
Solution: No Solution

$$\begin{array}{r} x - 3y = 6 \\ -x \qquad -x \\ \hline -3y = -x + 6 \\ \frac{-3y}{-3} = \frac{-x}{-3} + \frac{6}{-3} \\ y = \frac{1}{3}x - 2 \end{array}$$

$$\begin{array}{r} x - 3y = -3 \\ -x \qquad -x \\ \hline -3y = -x - 3 \\ \frac{-3y}{-3} = \frac{-x}{-3} - \frac{3}{-3} \\ y = \frac{1}{3}x + 1 \end{array}$$

$$2x - y = 1 \quad \left| \quad y = 2x - 1 \right.$$

$$6x - 3y = 3 \quad \left| \quad y = 2x - 1 \right.$$



Solution: Infinitely Many

$$\begin{array}{r} 2x - y = 1 \\ -2x \qquad -2x \\ \hline -y = -2x + 1 \\ \frac{-y}{-1} = \frac{-2x}{-1} + \frac{1}{-1} \\ y = 2x - 1 \end{array}$$

$$\begin{array}{r} 6x - 3y = 3 \\ -6x \qquad -6x \\ \hline -3y = -6x + 3 \\ \frac{-3y}{-3} = \frac{-6x}{-3} + \frac{3}{-3} \\ y = 2x - 1 \end{array}$$