

I can graph a system of lines to find the solution.

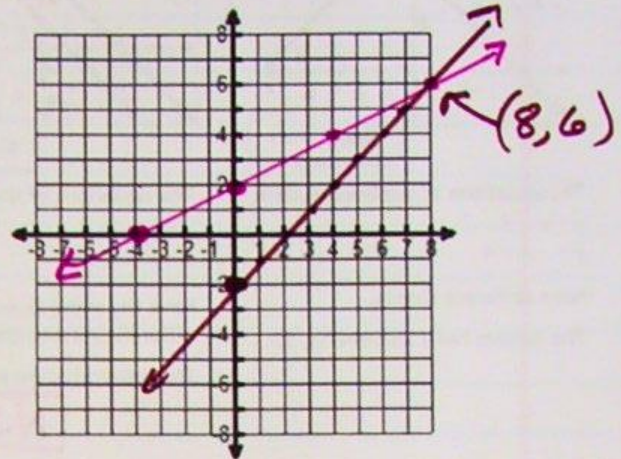
Graphing Systems of Lines

A system of linear equations contains two or more equations e.g. $x - 2y = -4$ and $y = x - 2$. The solution of such a system is the ordered pair that is a solution to both equations. To solve a system of linear equations graphically we graph both equations in the same coordinate system. The solution to the system will be in the point where the two lines intersect.

Graph the two lines on the same coordinate grid.

$x - 2y = -4$ and $y = x - 2$
 b: -2 m: $1 = \frac{1}{1}$

| x | y |
|----|---|
| 0 | 2 |
| -4 | 0 |



Where the two lines intersect is your solution to the system which means the point works in both equations.

Solution: (8, 6)

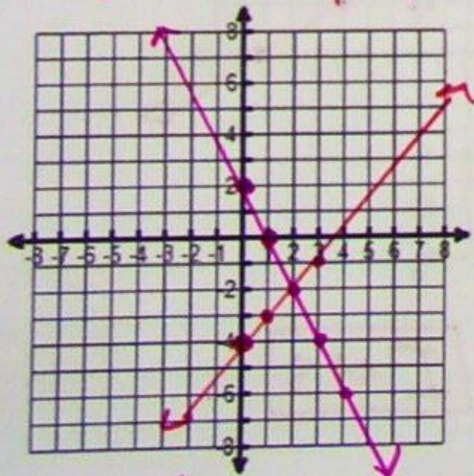
$x = 8$ $y = 6$

Show how the point satisfies both equations.

$x - 2y = -4$ and $y = x - 2$
 $8 - 2(6) = -4$ $6 = 8 - 2$
 $8 - 12 = -4$ $6 = 6$
 $-4 = -4$

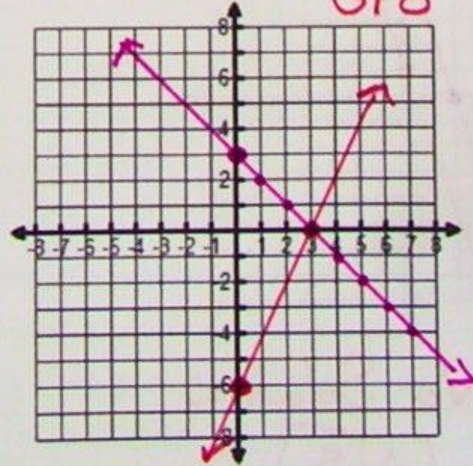
Graph the following systems of equations to find their solution.

1) $\begin{cases} 2x + y = 2 \\ y = x - 4 \end{cases}$
 $b = -4$ $m = 1 = \frac{1}{1}$



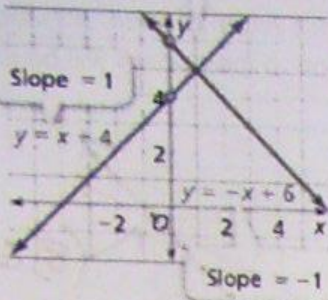
Solution: (2, -2)

2) $\begin{cases} y = -x + 3 \\ 2x - y = 6 \end{cases}$
 $b = 3$ $m = -1$



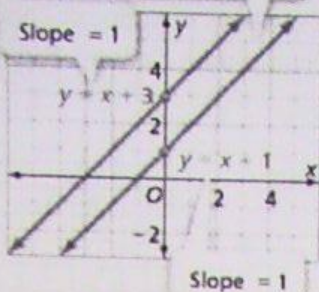
Solution: (3, 0)

The lines intersect at 1 point.
This system has 1 solution.



The equations of the linear system
 $y = x - 4$
 $y = -x + 6$
have different slopes.
The system has 1 solution (1, 5).

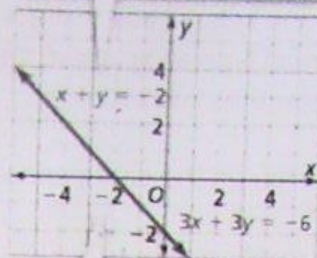
The lines do not intersect;
they are parallel. This
system has no solution.



The equations of the linear system
 $y = x + 3$
 $y = x + 1$
have the same slopes and
different y-intercepts.
The system has no solution.

NS

The lines intersect at every point;
they are the same line. This system
has infinitely many solutions.



The equations of the linear system
 $x + y = -2$
 $3x + 3y = -6$
have the same slopes and the same
y-intercepts. They represent the
same line.

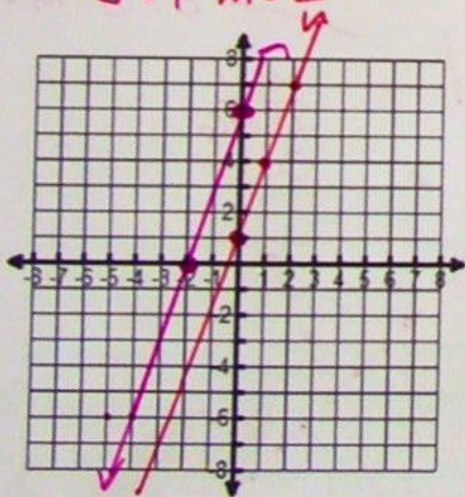
The system has infinitely many
solutions.

IMS

Graph the following systems of equations to find their solution.

3) $\begin{cases} 3x - y = -6 \\ y = 3x + 1 \end{cases}$ — $\begin{array}{r|l} x & y \\ \hline 0 & 6 \\ -2 & 0 \end{array}$

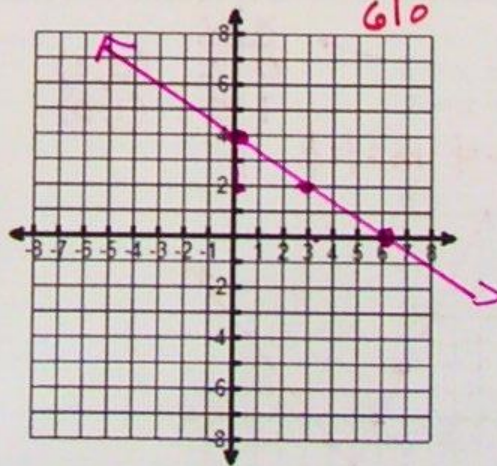
$b = 1$ $m = \frac{3}{3}$



Solution: **No Solution**
NS

4) $\begin{cases} y = -\frac{2}{3}x + 4 \\ 2x + 3y = 12 \end{cases}$ $b = 4$ $m = -\frac{2}{3}$

$\begin{array}{r|l} x & y \\ \hline 0 & 4 \\ 6 & 0 \end{array}$



Solution: **IMS**