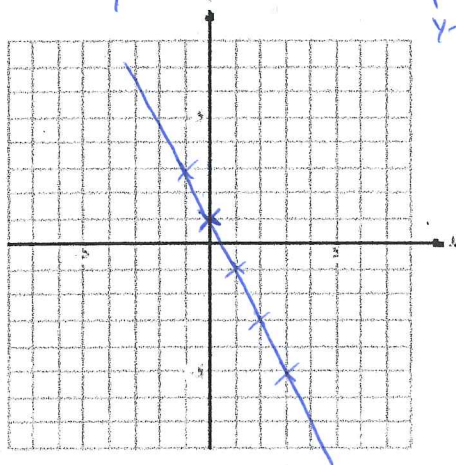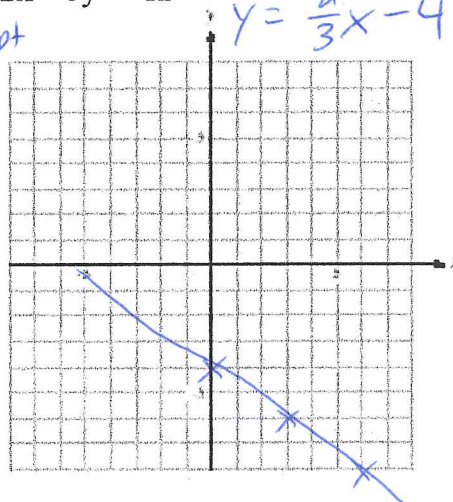A system of equations is two or more equations with two or more variables. For example, the equations $2x + 3y = 12$ and $4x + 7y = 28$ is a system of equations. The solution of a linear system can is the intersection point of the two equations. This point can be found algebraically or graphically.

$slope = \frac{rise}{run}$

Example 1: Graph the following lines.

$\frac{3y}{3} = \frac{-2x}{3} - \frac{12}{3}$

  a) $y = -2x + 1$ $y = mx + b$ (b) $2x + 3y = -12$ $y = \frac{-2}{3}x - 4$
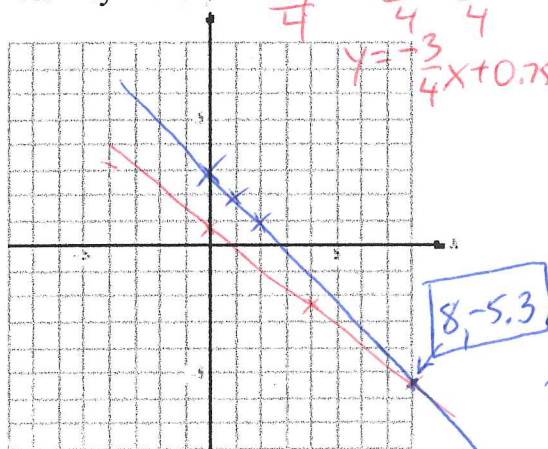
  $y\text{-intercept}$

To solve graphically, the two equations must be rearranged to isolate y, graphed, and find the intersection point.

Example 2: Find the solution to the following systems of equations.

1. $x + y = 3$ $y = -x + 3$ 2. $x - y = -2$ $y = x + 2$
       $3x + 4y = 3$ $\frac{3x}{4} = \frac{-3x}{4} + \frac{3}{4}$ $4x + 2y = 16$ $2y = -4x + 16$
                       $y = \frac{-3}{4}x + 0.75$ $y = -2x + 8$

$(2, 4)$
$x = 2$
$y = 4$

$(8, -5.3)$