

Solving a system of equations means to find the point that makes **all** of the equations true.

Elementary Algebra
Class Notes

Graphically Solving Systems of Linear Equations (section 4.1)

The method shown in this section uses the facts that ...

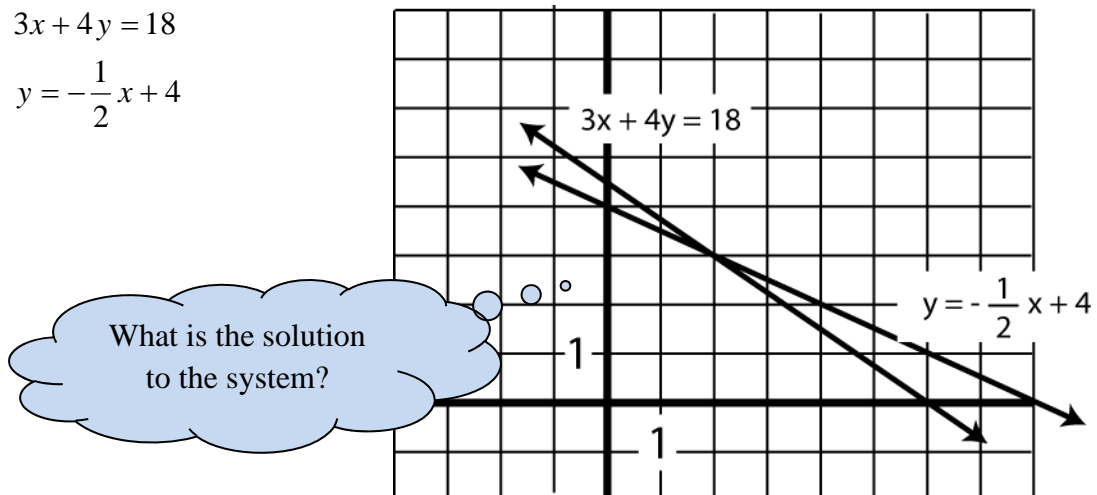
the graph of a linear equation is always a straight line, and
all the points on the graph of a line satisfy the equation (that is, makes it true).

Now, if we want to find the point that satisfies two different equations, we would start by graphing both lines. Then what would we look for on the graph? See the example below.

expl 1: Solve the system. The two lines are graphed for you.

$$3x + 4y = 18$$

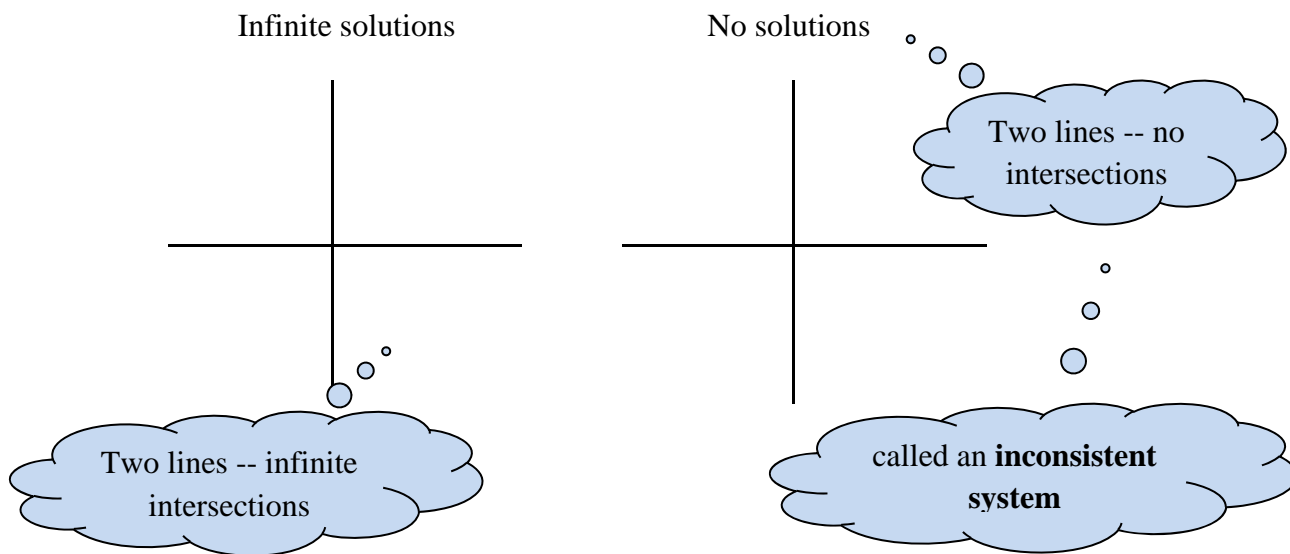
$$y = -\frac{1}{2}x + 4$$



Try your solution in both equations. Does it make **both** equations true?

Systems with infinitely many or no solutions:

So, the solution to a system of equations is the intersection of the two lines. The preceding example has one solution (corresponding to one intersection). There are two other possibilities, an infinite number of solutions or no solutions. Think about how those systems would look and draw possible graphs below.



Is it possible for two lines to intersect in exactly two or three points? Explain.

Worksheet: Solving linear systems graphically:

This worksheet contains most of the examples for this section including tips on how to graph the lines. It has examples of the three possibilities we face: one, none, and an infinite number of solutions.

Worksheet: Solving systems of equations graphically: Calculator worksheet:

This worksheet shows solving equations for y in order to put them into the calculator, using the Intersect function on the calculator (TI-82, 83, 84, 85, and 86) to find the exact intersection, and finding an appropriate window for our graphs.