

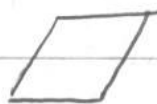
* should use graph paper

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Lesson 14: Solving Systems of Two Linear Equations by graphing

* What does it mean to have a system of equations?
This means that the solution must satisfy every equation in the system.

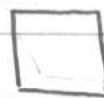
ex: Draw a rhombus (a figure with two pairs of parallel sides that are all equal)



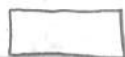
OR



OR




Draw a rectangle (a figure with two pairs of parallel sides which are at a right angle to each other)



OR



Draw a figure that is a rhombus and a rectangle (this must satisfy rhombus definition, and rectangle definition, so it must have 2 pairs of parallel lines, they must be equal, and at right angles).

Thus:  square satisfies both defined

* An equation is just a relationship between x and y , which, when solved for y gives a "definition" for y in terms of x . A set of coordinates x and y which make the equation true satisfy the definition and are thus a solution.

* A graph is just a picture of all points (x, y) that satisfy the equation (definition) (ie: all solutions)

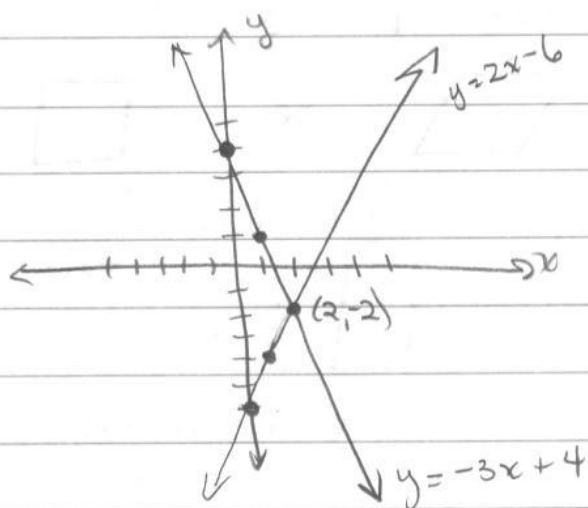
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Having a system of two equations means there are 2 definitions to be satisfied.

ex: Find the solution by graphing

$$y = -3x + 4 \quad \begin{matrix} m = -3 \\ b = 4 \end{matrix}$$

$$y = 2x - 6 \quad \begin{matrix} m = 2 \\ b = -6 \end{matrix}$$



* one line shows all the points satisfying $y = -3x + 4$ the other shows all the points satisfying $y = 2x - 6$. The point that satisfies both is exactly where the lines intersect.

Thus, $(2, -2)$ is the solution to the system (ie: there is only one point satisfying both)

Can a system have no solution? Yes, parallel lines never intersect.

Can a system have infinite solutions? Yes, if both equations are the same line

Can a system have more than one solution but not infinitely many? No, different lines can only intersect in one point since they're straight and don't turn around to cross again