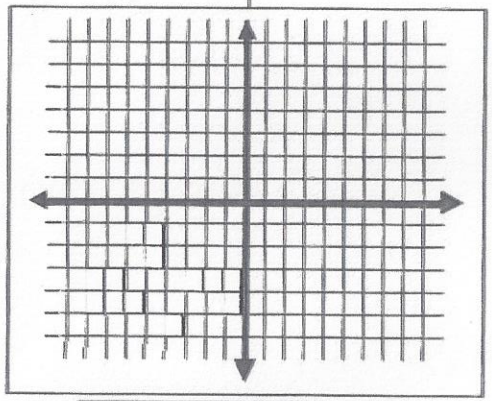
How do you find the solution to a system of linear equations?

$$2x + 3y = 5$$
$$4x - y = 17$$

Methods to Solve Systems of Linear Systems

GRAPHING



1. Graph Line 1.
2. Graph Line 2.
3. Visually identify the point of intersection.

- Intersecting lines have exactly one solution which is the point of intersection (x, y)
- Parallel lines have no solution because there is no point of intersection ∅
- Coinciding lines have an infinite number of solutions (all the points on the line are solutions of the system) {(x,y)|y=mx+b}

SUBSTITUTION

1. Isolate one variable in one of the equations.
2. Substitute that expression into the second equation and solve for the variable.
3. Substitute the value found in step 2 into either of the original equations and solve for the remaining variable.
4. Write the ordered pair.

COMBINATIONS

1. Rewrite each equation in standard form.
2. Choose a variable to eliminate and multiply by appropriate number to eliminate it.
3. Solve for remaining variable either by substituting into one of the original equations or by repeating step 2 for the other variable.
4. Write the ordered pair.

What if both of the variables cancel out? Look at the resulting arithmetic equation.
*False statement indicates the lines are parallel so there is no solution.
*True statement indicates the lines coincide so there are infinite solutions.

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