

Notes- Solving System by Graphing

Classifying Systems of Equations

If a system of equations has at least one solution, it is called consistent.

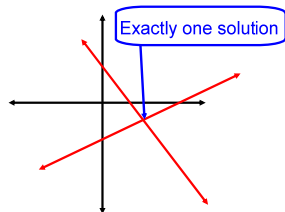
- If a system has exactly one solution, it is called independent.

- If a system has infinitely many solutions, it is called dependent.

If a system does not have a solution, it is called inconsistent.

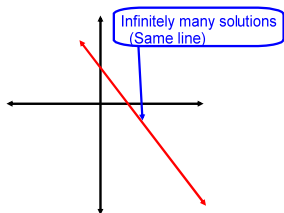
Know this vocab...it is tested

Intersecting lines



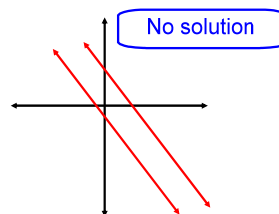
Consistent,
independent system

Coinciding lines



Consistent,
dependent system

Parallel lines



Inconsistent
system

Notes- Solving System by Graphing

Example

Without graphing, is the system *independent*, *dependent*, or *inconsistent*?

$$\begin{cases} 4y - 2x = 6 \\ 8y = 4x - 12 \end{cases}$$

Notice, this did not say without doing ANY work!

Solve for y.

$$4y - 2x = 6$$

$$4y = 2x + 6$$

$$y = \frac{1}{2}x + \frac{3}{2}$$

$$8y = 4x - 12$$

$$y = \frac{1}{2}x - \frac{3}{2}$$

notice the lines have the same slope but different y-intercepts.

Therefore, parallel lines.

So, **INCONSISTENT**

Example Solve by graphing. CHECK your solution.

$$-3x + 2y = 8 \rightarrow y = \frac{3}{2}x + 4$$

$$x + 2y = -8 \rightarrow y = -\frac{1}{2}x - 4$$

This means to substitute it back into BOTH original equations and make sure they are true statements.

Solution: (-4, -2)

CHECK:

$$-3x + 2y = 8$$

$$-3(-4) + 2(-2) = 8$$

$$12 - 4 = 8$$

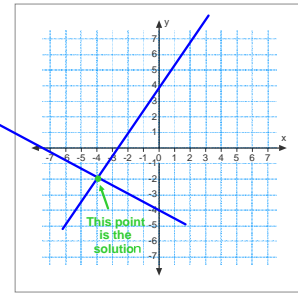
$$8 = 8$$

$$x + 2y = -8$$

$$(-4) + 2(-2) = -8$$

$$-4 - 4 = -8$$

$$-8 = -8$$



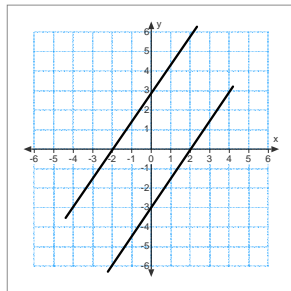
Example Solve by graphing.

$$\begin{cases} 2y = 3x - 6 \rightarrow y = \frac{3}{2}x - 3 \\ -6x + 4y = 12 \rightarrow y = \frac{3}{2}x + 3 \end{cases}$$

LOOK!

This one is easy to graph by the intercepts!

Solution: NO solution



What would be different when solving a system of inequalities?

$$\text{Ex. } y > 2x - 4$$

$$2x - y \geq -3$$

Only shade the final solution!!

$$2x - y \geq -3$$

$$-y \geq -2x - 3$$

$$y \leq 2x + 3$$

