Quiz Literal

5. $2x - 3y = -24$ solve for y

6. $x + 6y = 18$ solve for x

Warm up: Solve the given system by elimination

1) $6x - 3y = 21$

$3x + 3y = -3$

$(2, -3)$

2) $-3x + 4y = -4$

$6x - 12y = 12$

$(0, -1)$

Solve Systems of Equations by Graphing

Linear Systems

- **Question:** How can we analyze a **system** of **Equations Graphically** to determine if there is a **solution**?
- A system of equations means: **There are two or more equations sharing the same variables**
- Solution: **Is a set of values that satisfy both equations. Graphically it is the point of intersection**

Types of Systems

- There are 3 different types of systems of linear equations

3 Different Systems:

1) Infinite Solutions
2) No Solution
3) One solution

Determine a Solution to a Linear System

OPENER

Which of the following ordered pairs are solutions to the following system?

$$5x + 2y = 10$$

$$-4x + y = -8$$

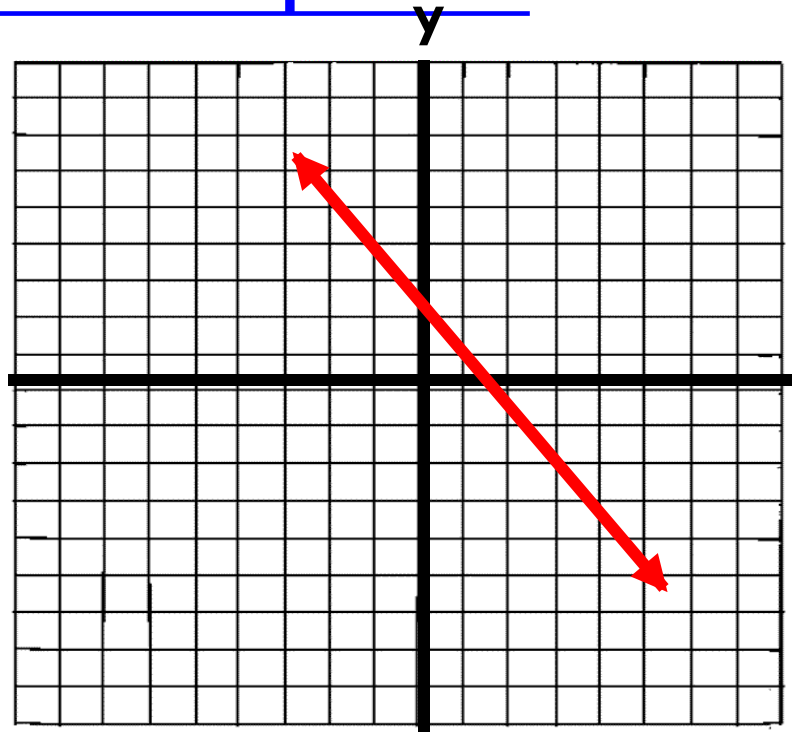
1) (3,1)

2) (2,0)

-8

Type 1: Infinite Solutions

- A system of linear equations having an **infinite number of solutions** is described as being **consistent-dependent**.



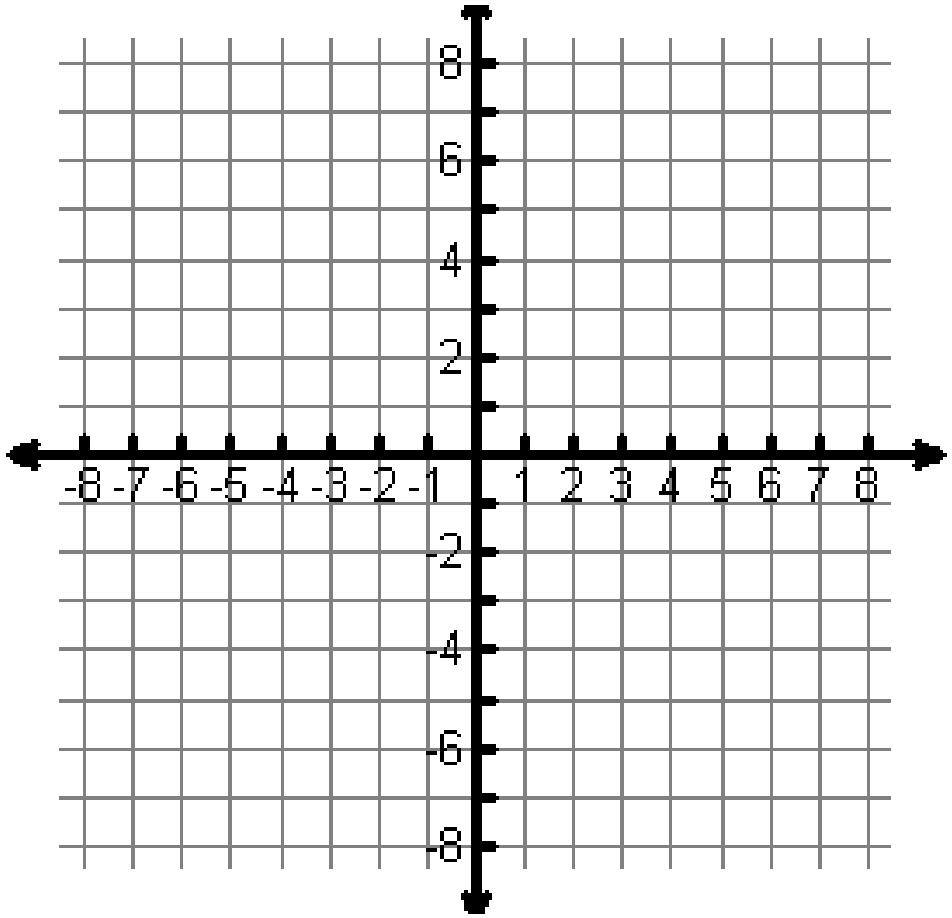
← The system has **infinite solutions**, the lines are identical

y = 2x + 3

1. Graph to find the solution.

$y = 2x + 3$

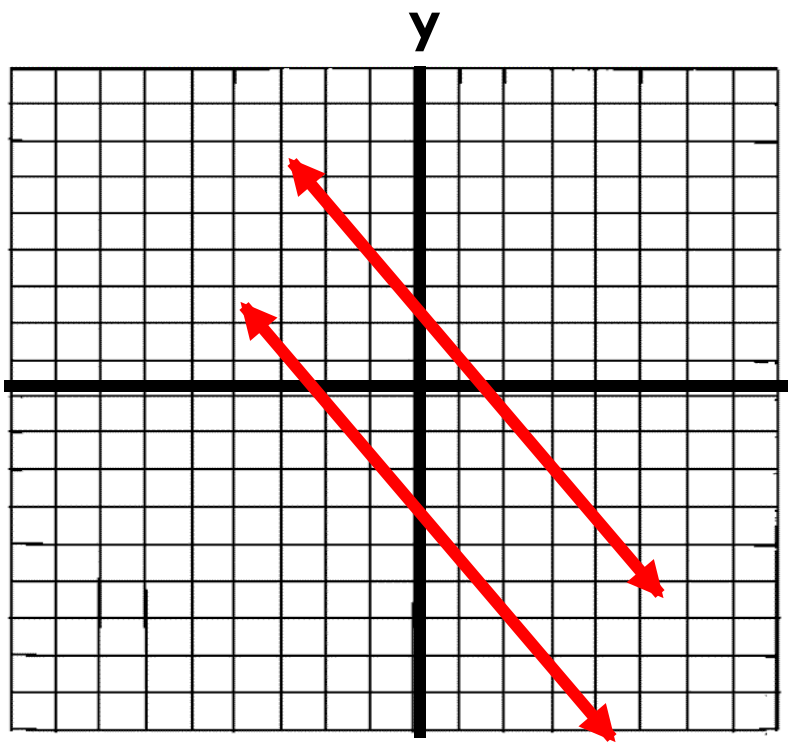
$y = 2x + 3$



INFINITE Solutions

Type 2: No Solutions

- A system of linear equations having **no solutions** is described as being **inconsistent.**



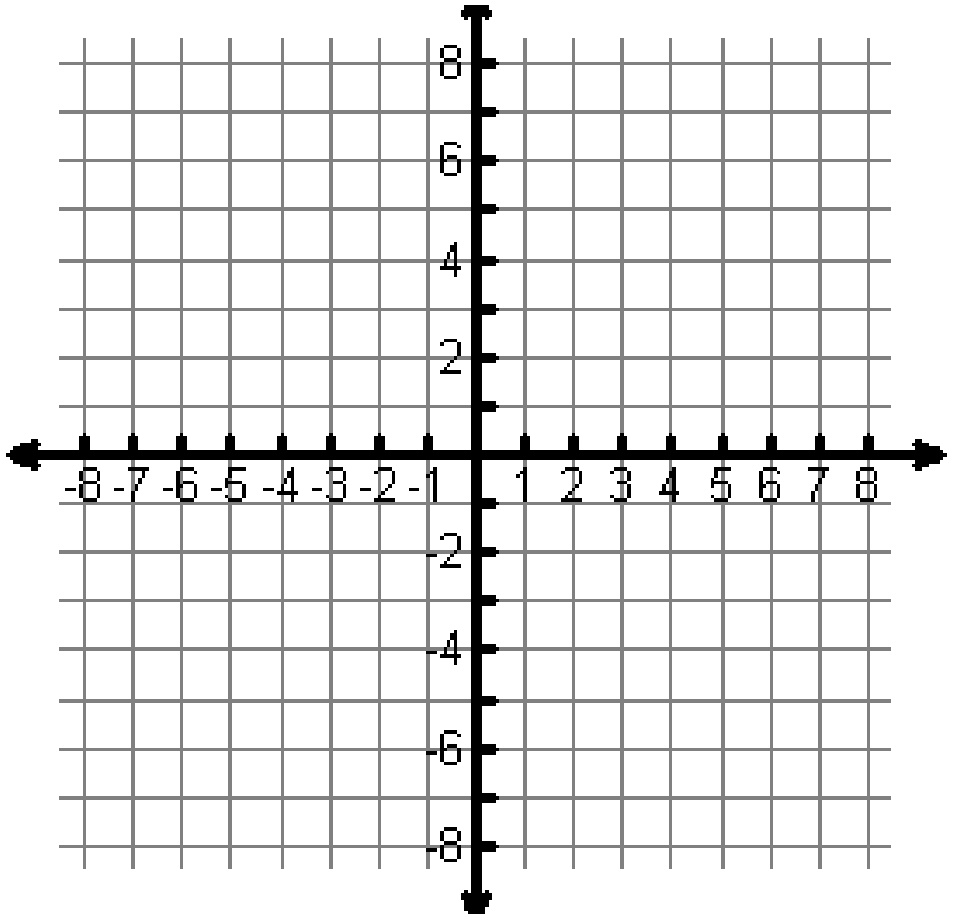
← The system has **no solution**, the lines are parallel

Remember, parallel lines have **the same slope**

2. Graph to find the solution.

$$y = -2x + 5$$

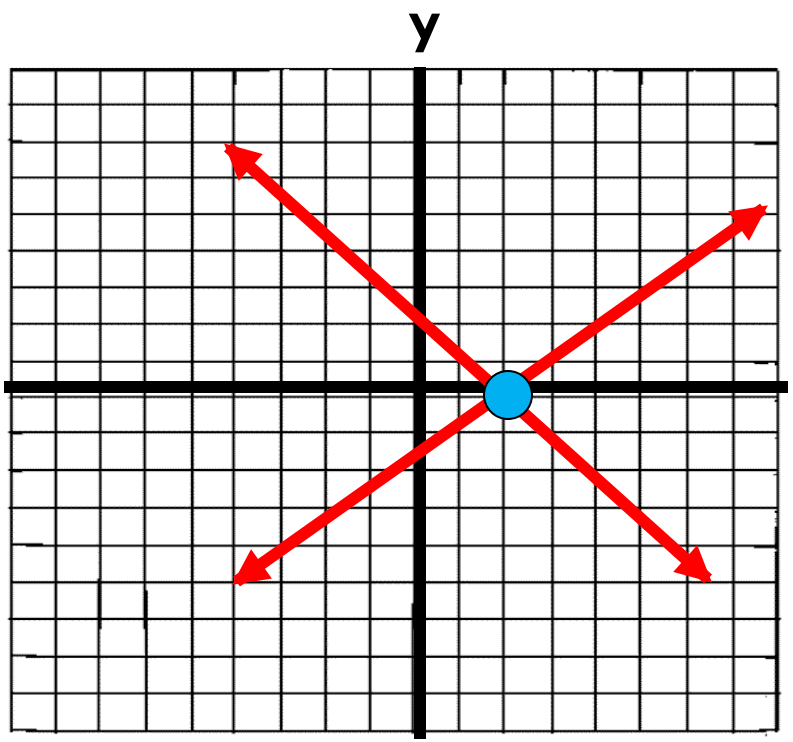
$$y = -2x + 1$$



No Solution

Type 3: One solution

- A system of linear equations having **exactly one solution is** *described as being* **one solution.**

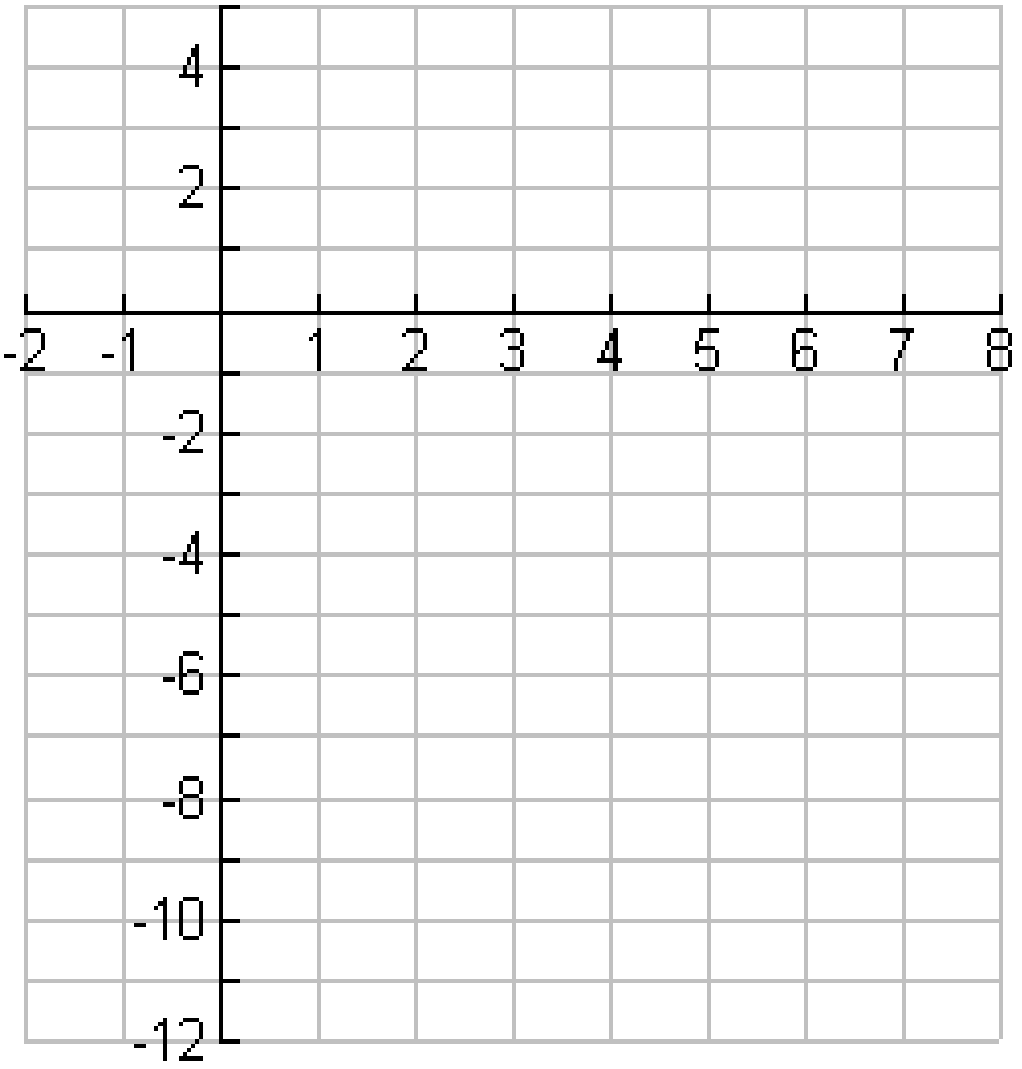


← The system has **exactly** one solution at the *point of intersection*

3. Graph to find the solution.

$y = 3x - 12$

$y = -2x + 3$



Solution:

(3, -3)

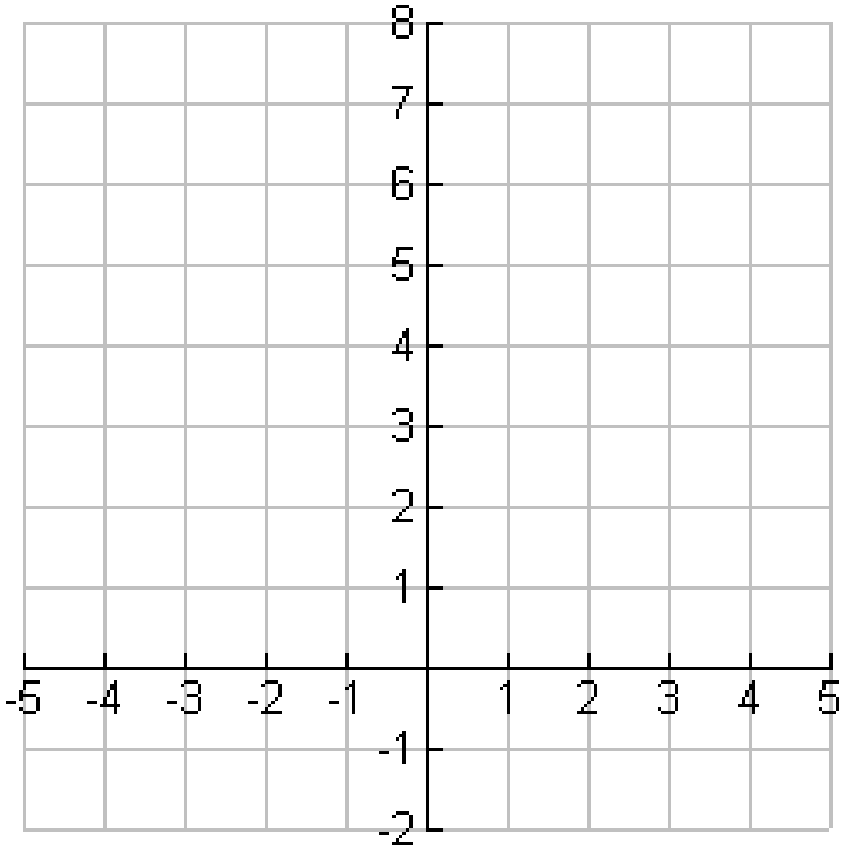
Steps

1. **Make sure each equation is in slope-intercept form: $y = mx + b$.**
2. **Graph each equation on the same graph paper.**
3. **The point where the lines intersect is the solution.** ***If they don't intersect then there's no solution.***
4. **Check your solution algebraically.**

1. Graph to find the solution.

$$2x - 2y = -8$$

$$2x + 2y = 4$$



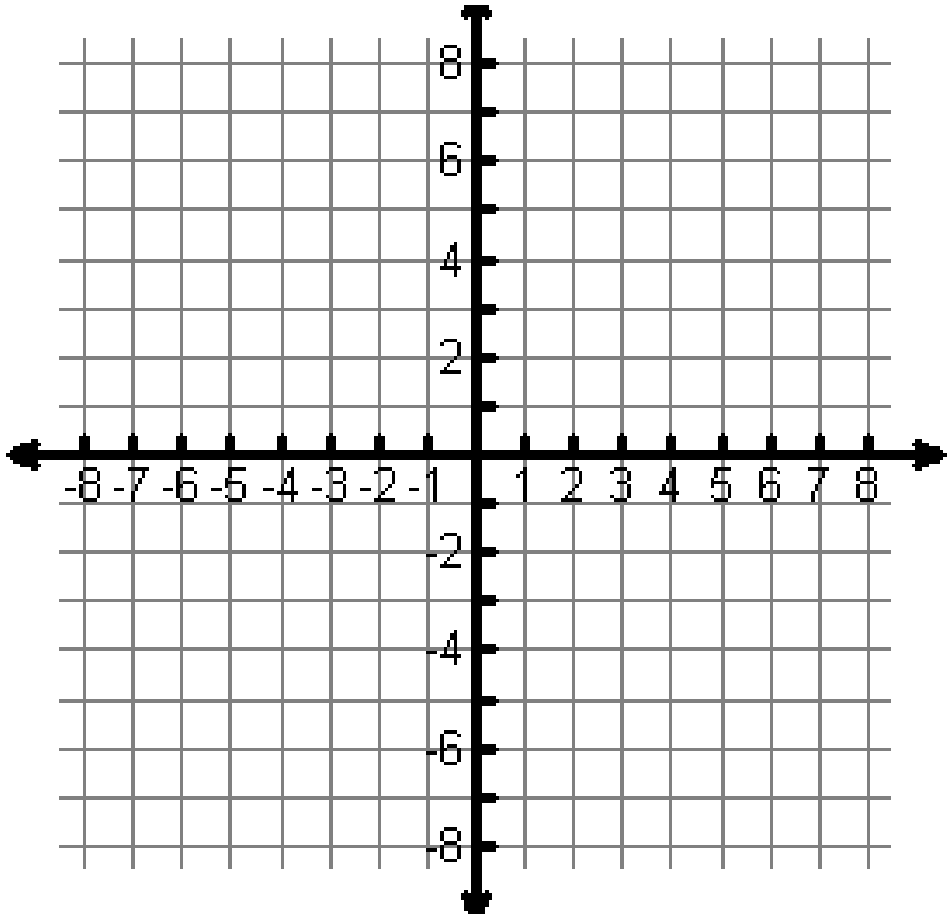
Solution:

(-1, 3)

3. Graph to find the solution.

$$x + y = -2$$

$$2x - 3y = -9$$



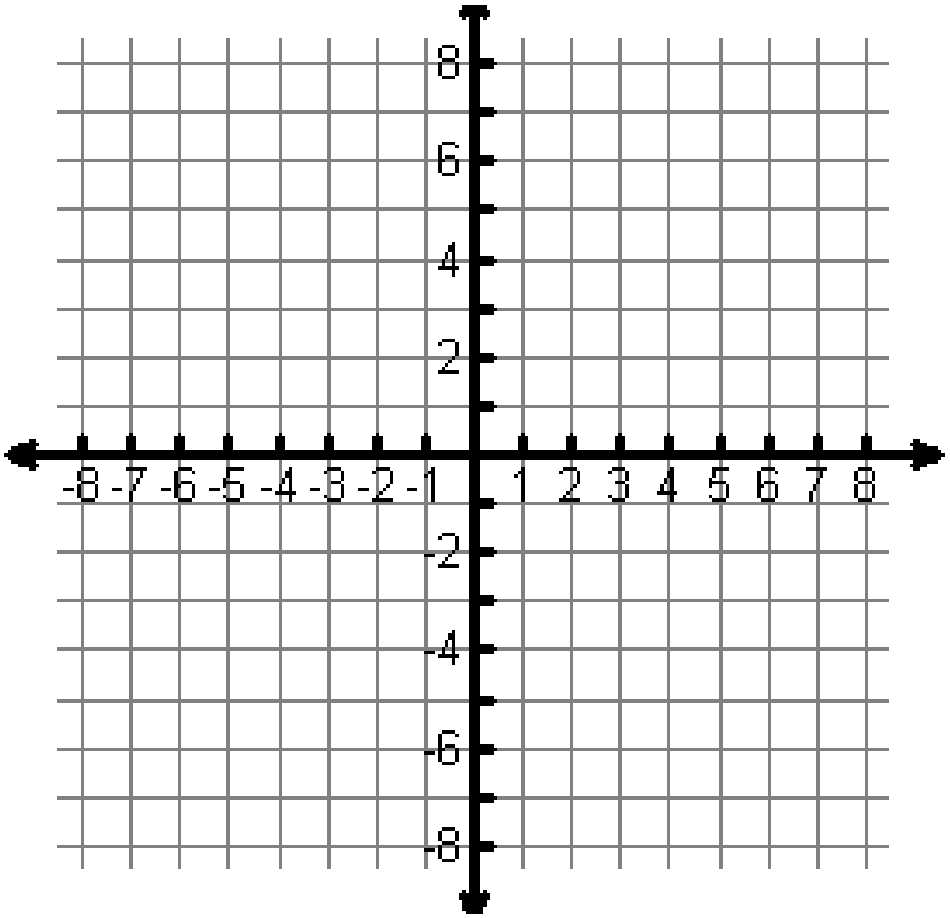
Solution:

(-3, 1)

4. Graph to find the solution.

$y = 5$

$2x + y = 1$



Solution:

(-2, 5)

Types of Systems

- There are 3 different types of systems of linear equations

3 Different Systems:

1) Infinite Solutions
2) No Solution
3) One solution

So basically….

- If the lines have the same y-intercept b, and the same slope m, then the system has **Infinite Solutions.**

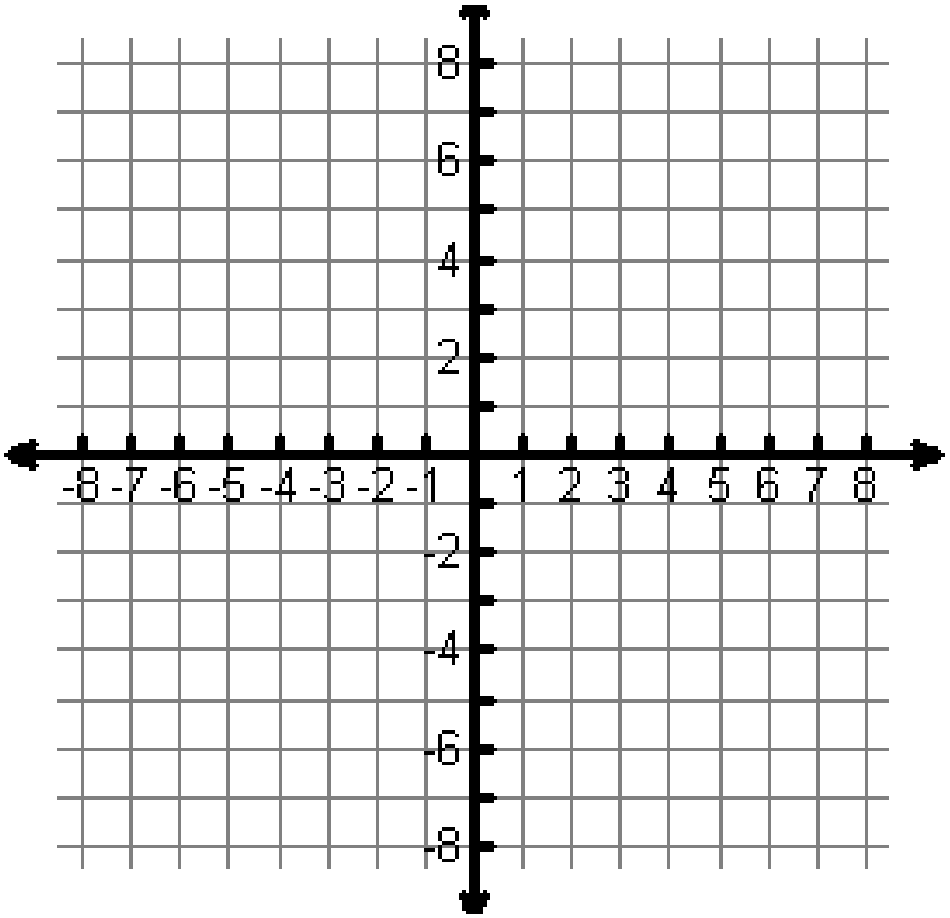
- If the lines have the same slope m, but different y-intercepts b, the system has **No Solution.**

- If the lines have different slopes m, the system has **One Solution.**

4. Graph to find the solution.

$y = 5$

$2x + y = 1$



Solution:

(-2, 5)

Opener

Finish Graphing to Perfection

Solve Systems of Equations by Substitution

Steps

1. One equation will have either x or y by itself, or can be solved for x or y easily.
2. Substitute the expression from Step 1 into the other equation and solve for the other variable.
3. Substitute the value from Step 2 into the equation from Step 1 and solve.
4. Your solution is the ordered pair formed by x & y.
5. Check the solution in each of the original equations.

Solve by Substitution

1. $x = -4$

   $3x + 2y = 20$

1. (-4, 16)

Solve by Substitution

2. $y = x - 1$

$x + y = 3$

2. (2, 1)

Solve by Substitution

3. $3x + 2y = -12$

$y = x - 1$

3. (-2, -3)

Solve by Substitution

4. $x = 1/2\ y - 3$

   $4x - y = 10$

4. (8, 22)

Solve by Substitution

5. $x = -5y + 4$

$3x + 15y = -1$

5. No solution

Solve by Substitution

6. $2x - 5y = 29$

$x = -4y + 8$

6. (12, -1)

Solve by Substitution

7. $x = 5y + 10$

$2x - 10y = 20$

7. Many solutions

Solve by Substitution

8. $2x - 3y = -24$

$x + 6y = 18$

9. (-6, 4)

CW/HW

1. $y = 6x - 11$
   $-2x - 3y = -7$

2. $2x - 3y = -1$
   $y = x - 1$

3. $y = -3x + 5$
   $5x - 4y = -3$

4. $-3x - 3y = 3$
   $y = -5x - 17$

5. $y = -2$
   $4x - 3y = 18$

6. $y = 5x - 7$
   $-3x - 2y = -12$

HW

Graphing and Substitution WS