## Panel 1

System of Linear Equations:

Two linear equations in the same variables.

## Panel 2

Solving a system of linear equations by graphing.

The solution is the point of intersection.
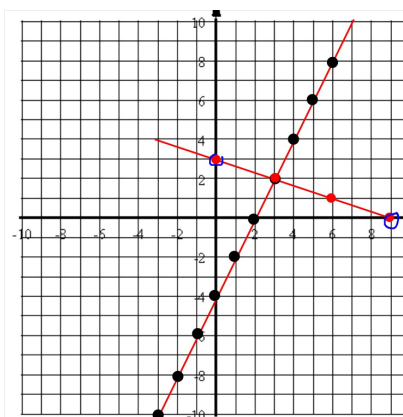
## Panel 3

Solve each system of linear equations by graphing:

1. $y = 2x - 4$
   $2x + 6y = 18$

2. $y = 3$
   $12x + 8y = -24$

3. $y = -0.5x$
   $x = 4$

4. $y = 3x + 1$
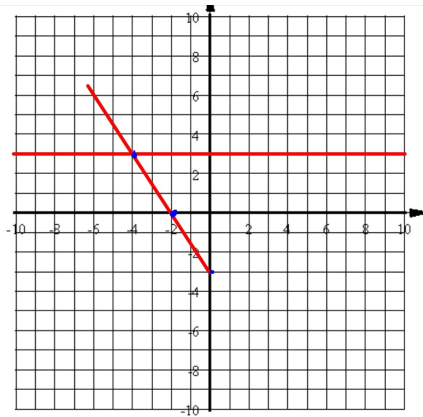   $15x - 5y = 10$

## Panel 4



$(3, 2)$

$y = 2x - 4$

$2x + 6y = 18$

$y = \dfrac{18 - 2x}{6}$

$y = 3 - \dfrac{1}{3}x$

x-INT $= \dfrac{18}{2} = 9$

y-INT $= \dfrac{18}{6} = 3$

## Panel 1 (top left)
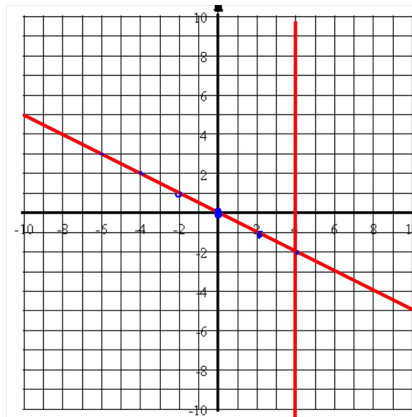


$$y = 3$$
$$12x + 8y = -24$$

X-INT = -2
Y-INT = -3

$(-4, 3)$

## Panel 2 (top right)



$$y = -0.5x$$
$$x = 4$$
$-1/2$

$(4, -2)$

## Panel 3 (bottom left)



$$y = 3x + 1$$
$$15x - 5y = 10$$

NO SOL

$y = \dfrac{10 - 15x}{-5}$

$-2 + 3x$

## Panel 4 (bottom right)
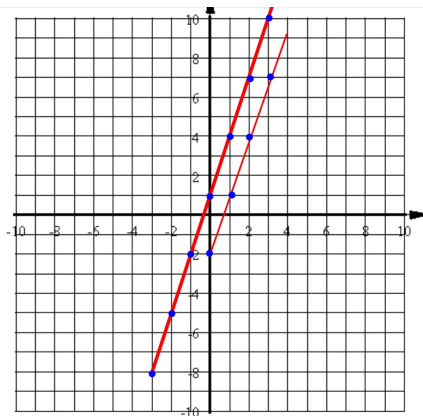
Possible solutions to a system of linear equations:

- One Solution: if lines intersect
- No Solution: if lines are parallel
- Many Solutions: if lines are the same equation

## Slide 1

One Solution          Independent

No Solution          Inconsistent

Many Solutions          Dependent

## Slide 2

One Solution:

Two lines intersect if:

- Slopes are different
- Y-intercept doesn't matter!

## Slide 3

Does this system of equations have one solution?

$$Yes - they\ have\ different\ slopes$$

$y = 4x - 9 \quad m = 4$

$8x + 2y = 10$

$y = \dfrac{10 - 8x}{2} = \quad -4x + 5 \quad m = -4$

## Slide 4

No Solution:

Two lines don't intersect if they are Parallel.

Two lines are parallel if they:

- Have the same slope
- But different y-intercepts

Does this system of linear equations
have no solution?

NO - there is 1 sol

$y = 3x - 11$    $m = 3$

$2x - 6y = 28$

$y = \dfrac{28 - 2x}{-6} = \dfrac{28}{-6} + \dfrac{1}{3}x$    $m = \dfrac{1}{3}$

Many Solutions:

A system of linear equations has
many solutions if the two lines are the same.

Two lines are the same if:
- They have the same slope
- And the same y-intercept.