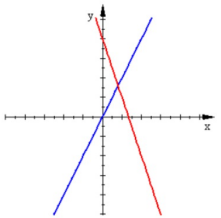
If two lines are graphed together, how many points of intersection can there be?

1. One

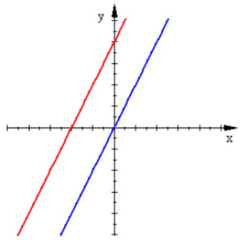
$y = -2x + 8$ and $y = 2x$



The intersect because they have different slopes.

2. None

$y = 2x$ and $y = 2x + 8$

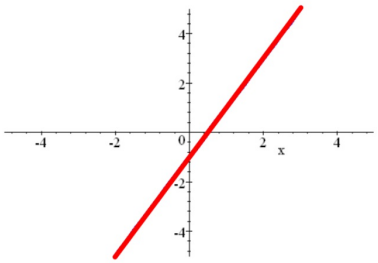


Lines are parallel

This system of equations has NO SOLUTIONS because the lines have the same slope but different y-intercepts.

3. Infinitely Many

$y = 2x - 1$ and $8x - 4y = 4$



They are the same line.

This system of equations has MANY SOLUTIONS because the lines have the same slope and same y-intercept.

If two lines are graphed together, how many points of intersection can there be?

One: If the two lines intersect
Lines have different Slopes

None: If the two lines are parallel
Lines have same slope
and different y-intercepts.

Many: If they are the same line
Lines have same slope
and same y-intercept.

If a system of equations contains two lines that are parallel, then the system of equations has NO solution.

If a system of equations contains two lines that are actually the same line, then the system of equations has infinitely MANY solutions.

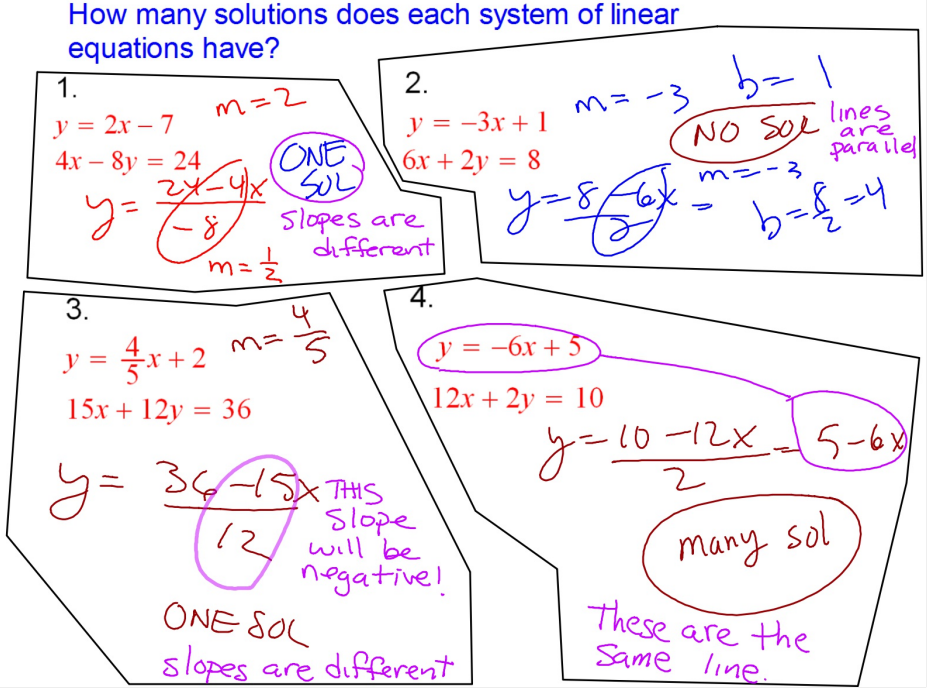
If a system of equations contains two lines that intersect, then the system of equations has infinitely ONE solution.

How can you find the number of solutions to a system of linear equations without graphing?

Number of solutions to systems of linear equations

# of Solutions	How do you tell without graphing
One Solution:	Lines have a different slope
No solution:	Parallel Lines • same slope • different y-intercept
Many Solutions:	Same lines • same slope • same y-intercept

How many solutions does each system of linear equations have?



You can now finish:

Hwk #2: Use the sheet I've printed for you

The landscaper was paid $100 for materials then $8.50 per hour to finish the flower garden.

$y = 8.50h + 100$

Another landscaper worked the same number of hours and charged $140 for materials then $7.25 per hour to do another project.

$y = 7.25h + 140$

Find the number of hours worked if their total bill was the same.

Use substitution to create an equation

$7.25h + 140 = 8.50h + 100$

$-7.25h \quad -7.25h$

$140 = 1.25h + 100$

$-100 \quad -100$

$40 = 1.25h$

$32 \text{ hrs} = h$

Solve this system of equations using SUBSTITUTION

$y = 4x - 3$ $\quad$ $y = -2x + 15$

Sol: $(3, 9)$

$y = 4(3) - 3$

$= 12 - 3$

$y = 9$

$4x - 3 = -2x + 15$

$+2x \quad +2x$

$6x - 3 = +15$

$+3 \quad +3$

$6x = 18$

$x = 3$

now replace x with 3 & find y

Solve. $4x - 3(2x - 10) = 24$

$4x - 6x + 30 = 24$

$-2x + 30 = 24$

$-30 \quad -30$

$\frac{-2x}{-2} = \frac{-6}{-2}$

$x = 3$

Solve this system of equations using SUBSTITUTION

$Y = 4X + 1$ $\quad$ $5X + 3Y = 37$

$y = 4(2) + 1$

$= 8 + 1$

$y = 9$

$5x + 3(4x + 1) = 37$

$5x + 12x + 3 = 37$

$17x + 3 = 37$

$-3 \quad -3$

$\frac{17x}{17} = \frac{34}{17}$

$x = 2$

Sol: $(2, 9)$