HW/classwork: p 360, 2-20even, 21-23

11/6/12 Solving Systems of equations by graphing.

Definition: A system of equations is just a group of 2 or more equations.

We will be dealing with groups of 2 equations. These equations will represent lines on the coordinate plane.

Definition A solution to a system of 2 equations involving x and y is the ordered pair where the graphs intersect.

Tell whether the ordered pair is a solution of the system:

Example

1) $5x - 2y = 23$ $(5, 1)$ (x, y)
$4x + y = 21$

$5(5) - 2(1) = 23$
$25 - 2 = 23$
$23 = 23$ ✓ True!

$4(5) + 1 = 21$
$20 + 1 = 21$
$21 = 21$ ✓ True!

Ans: Yes, (5,1) is a solution

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

$1 = -\frac{1}{3}(-3)$
$1 = \frac{+3}{3}$
$1 = 1$ ✓ True

$3y = -5x - 12$
$3(1) = -5(-3) - 12$
$3 = +15 - 12$
$3 = 3$ ✓ True!

Ans: Yes, (-3,1) is a solution

3) $(-3, 4)$ $y = -4$ (x, y)
$2x = -y - 2$
$4 = -4$ ✗ False!

Ans: No, (-3,4) is not a solution

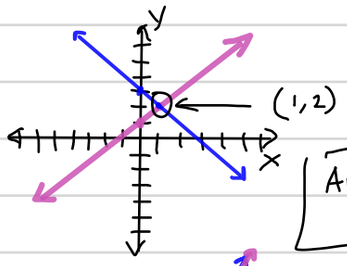
1) Plug the ordered pair into each equation.
2) Check for true or false statements in each case.
3) • If both are true, then it is a solution.
• If at least 1 is false, it is NOT a solution

Example

Solve by graphing

4) $x + y = 3 \longrightarrow x + y = 3$
$-x \quad -x$
$y = -1x + 3$
$\frac{y}{1} = \frac{-1x}{1} + \frac{3}{1}$

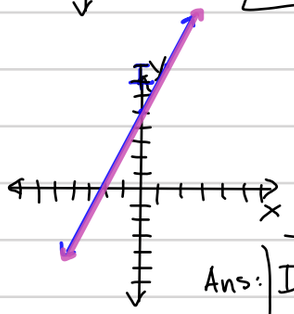
$x - y = 1$
$-x \quad -x$
$\frac{-y}{-1} = \frac{-x}{-1} + \frac{1}{-1}$
$y = \frac{1}{1}x + 1$



Ans: (1,2)

5) $-3x = 5 - y \longrightarrow -3x = 5 - y$
$+y \quad +y$
$y - 3x = 5$
$+3x \quad +3x$
$y = 3x + 5$

$\frac{2y}{2} = \frac{6x}{2} + \frac{10}{2}$
$y = 3x + 5$



Ans: Infinitely many solutions

1) Get each into $y = mx + b$ form.
2) Graph each.
3) The answer is the point where the lines intersect.

If the lines are parallel, Ans: No sol b/c the lines don't intersect!

Note: When your two lines turn out to be exactly the same, then the answer is infinitely many solutions, because the graph shows infinitely many points.