Lesson 9: (Sect 3.1) Graphing Systems of Equations

Objectives:

~ Graph two lines by hand (x and y int) and find the point of intersection - the solution.

~ Graph two lines on Calculator and find the point of intersection - the solution.

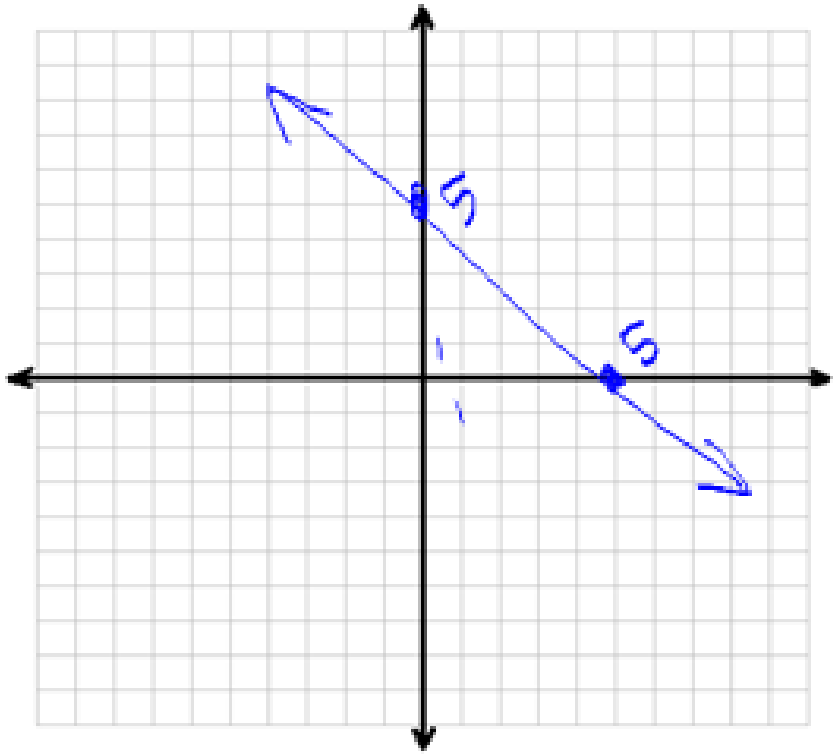
review

GRAPHING LINEAR EQUATIONS (X AND Y INTERCEPTS)

GRAPH THE FOLLOWING EQUATION: $X + Y = 5$

x-int: (5, 0)

y-int: (0, 5)



review

GRAPHING LINEAR EQUATIONS

GRAPH THE FOLLOWING EQUATION: $3X - 2Y = 20$

x-int: $(20/3, 0)$

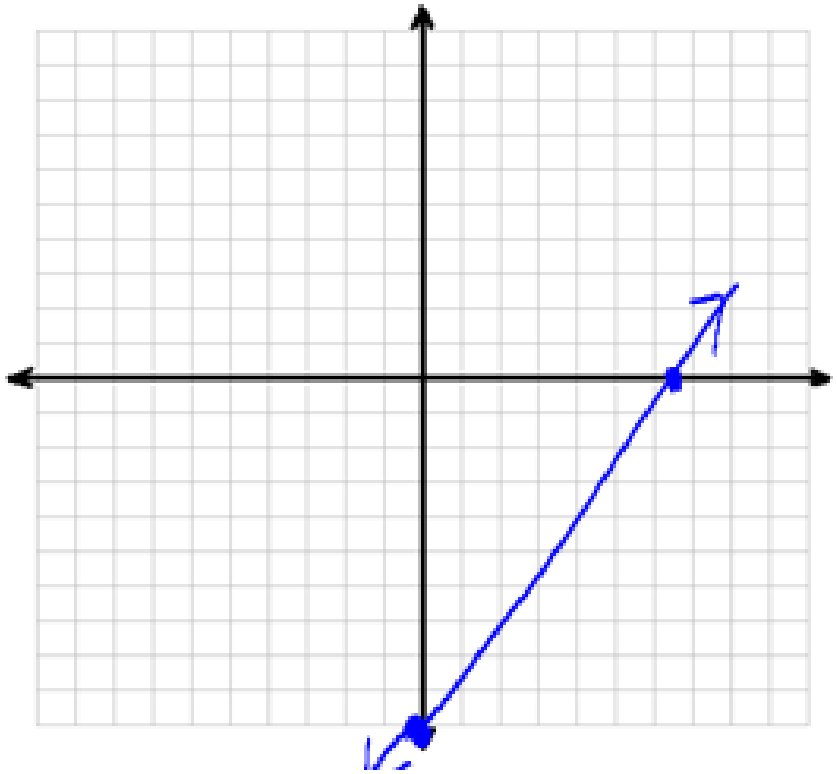
$\frac{3x}{3} = \frac{20}{3}$

$x = 20/3 = 6\frac{2}{3}$

y-int: $(0, -10)$

$\frac{-2y}{-2} = \frac{20}{-2}$

$y = -10$



SYSTEMS OF EQUATIONS

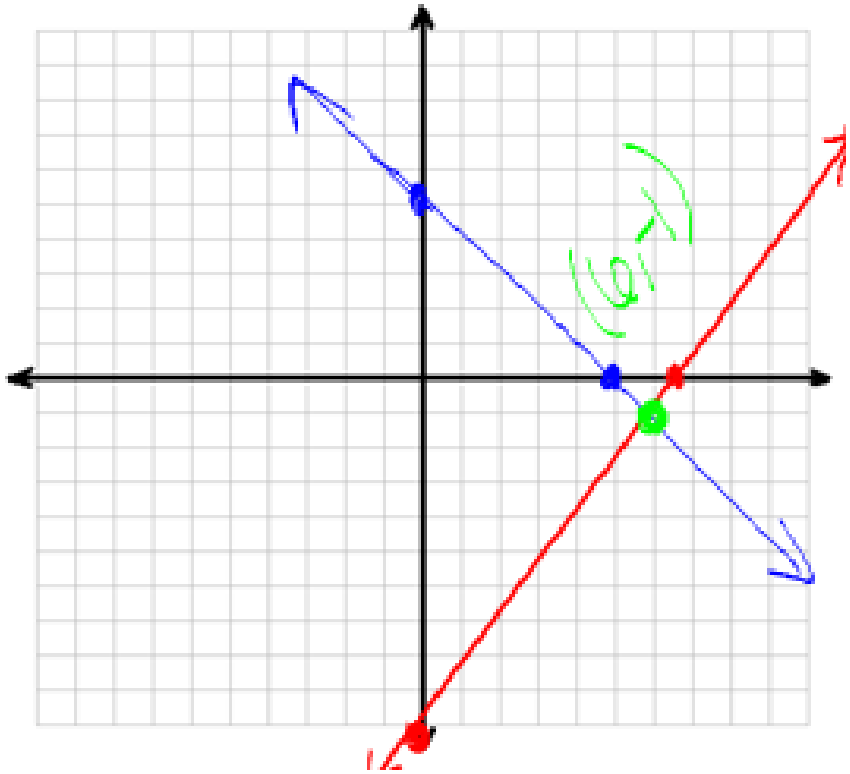
GRAPH $X + Y = 5$ AND $3X - 2Y = 20$ ON THE SAME GRAPH.

x-int: (5,0) y-int: (0,5) | x-int: $(\frac{20}{3}, 0)$ y-int: (0,-10)

THESE TWO EQUATIONS TOGETHER MAKE A SYSTEM OF EQUATIONS.

THE POINT IN WHICH THE 2 LINES INTERSECT IS KNOWN AS THE SOLUTION FOR THE SYSTEM OF EQUATIONS.

(6,-1)



Example 1:

SOLVE THE SYSTEMS OF EQUATIONS BY GRAPHING BY HAND (X AND Y INTERCEPTS)

$X + Y = 6$ x-int: $(6, 0)$ y-int: $(0, 6)$

$3X - 4Y = 4$

x-int: $(4/3, 0)$ y-int: $(0, -1)$

$3x = 4$

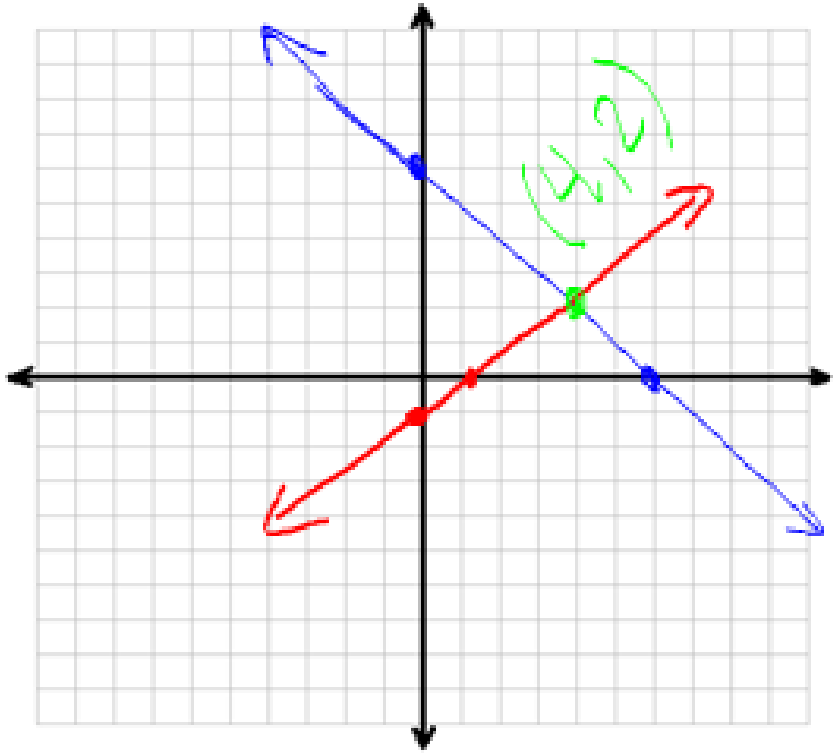
$x = 4/3 = 1\frac{1}{3}$

$-4y = 4$

$y = -1$

CHECK (PLUG IN SOLUTION):

$(4, 2)$



Check: (4,2)

$x + y = 6$

$4 + 2 = 6$

$6 = 6$ ✓

$3x - 4y = 4$

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

$12 - 8 = 4$

$4 = 4$ ✓

Example 2:

SOLVE THE SYSTEMS OF EQUATIONS BY GRAPHING BY HAND (X AND Y INTERCEPTS)

$3X - Y = 0$ x-int: (0,0) y-int: (0,0)

Pick an x: $x = 2$

$3(2) - y = 0$

$6 - y = 0$

$-6 \quad -6$

$-y = -6$

$y = 6$

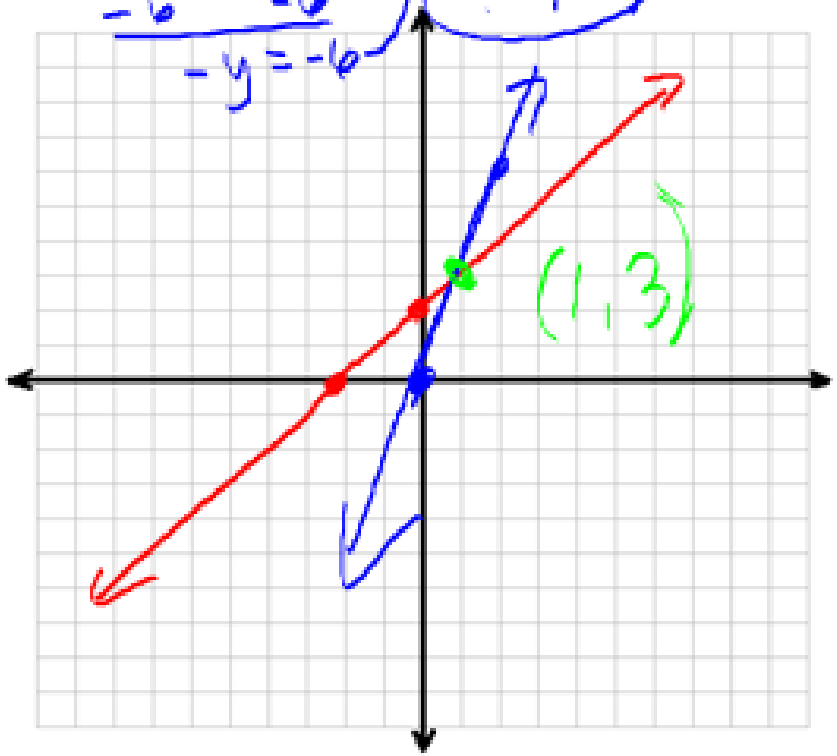
(2,6)

$X - Y = -2$

x-int: (-2,0)

y-int: (0,2)

(1,3)



CHECK (PLUG IN SOLUTION):

Example 3:

SOLVE THE SYSTEMS OF EQUATIONS BY GRAPHING WITH CALCULATOR

$2X + Y = 4 \rightarrow y = -2x + 4$

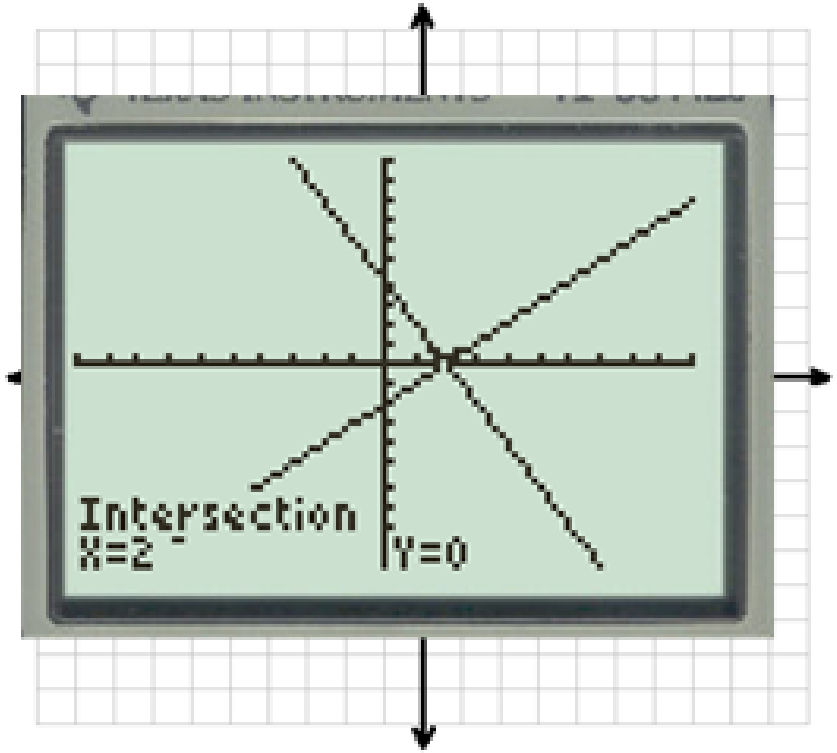
$X - Y = 2$

$-x \quad -x$

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

CHECK (PLUG IN SOLUTION):

$(2, 0)$



Lesson 9: (Sect 3.1) Graphing Systems of Equations

To find the intersection on the calculator:

1. Graph the two lines.
2. Push the "Trace" button. Arrow over until you are close to the intersection.
3. Now, push 2nd Trace - this is "CALC". Arrow down to #5 Intersect and hit "Enter".
4. It will ask for a First Curve Guess and a Second Curve Guess. Hit enter twice. (You should already be as close as you can get to the intersection.) This should give you the intersection (x and y).

Example 4:

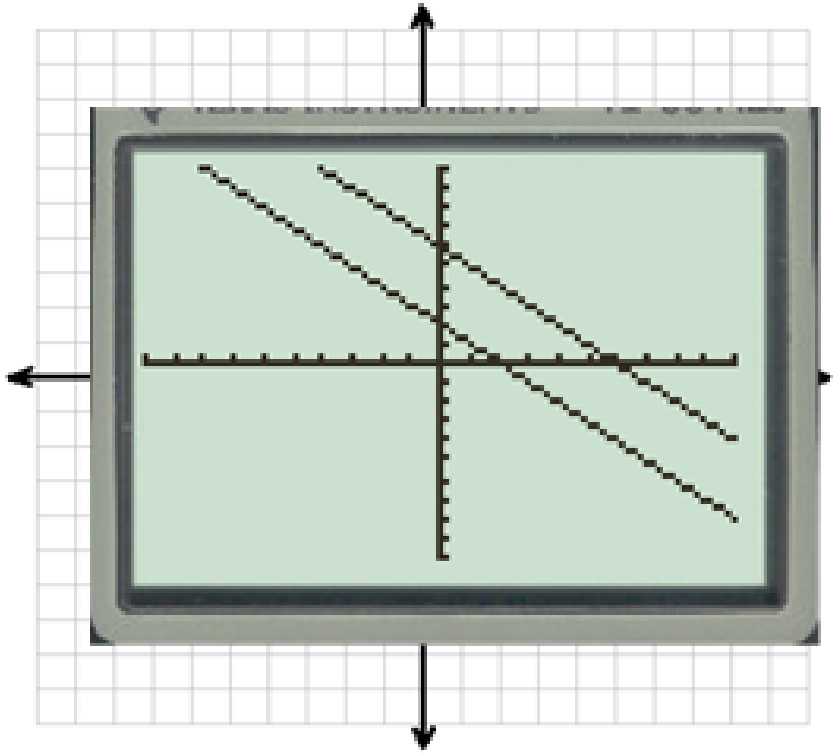
SOLVE THE SYSTEMS OF EQUATIONS BY GRAPHING BY CALCULATOR

$X + Y = 2 \rightarrow y = -x + 2$

$X + Y = 6 \rightarrow y = -x + 6$

no solution

CHECK (PLUG IN SOLUTION): parallel lines



Example 5:

SOLVE THE SYSTEMS OF EQUATIONS BY GRAPHING BY CALCULATOR

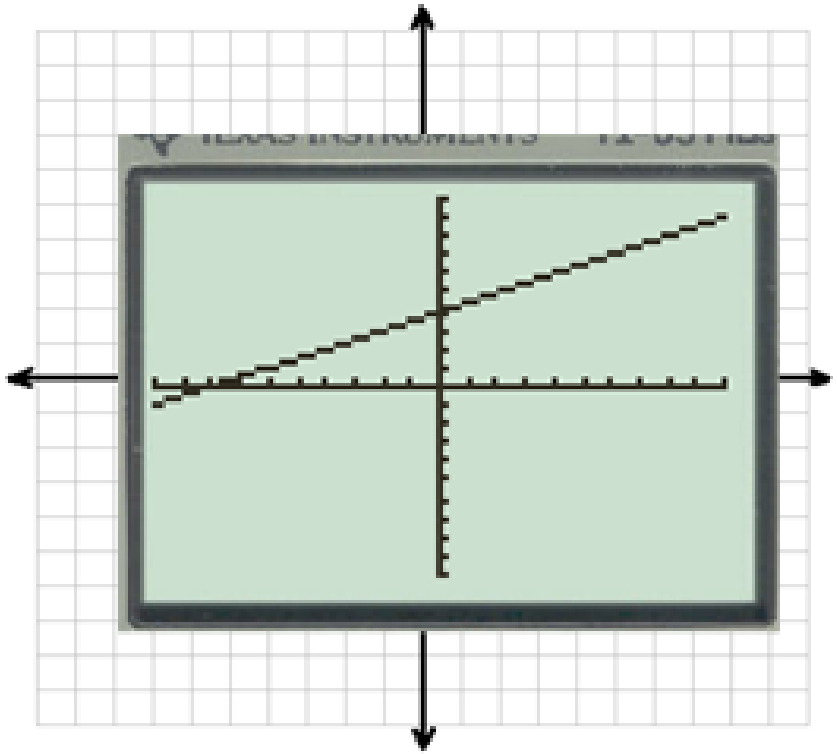
$2Y - 8 = X \rightarrow \frac{2y}{2} = \frac{x+8}{2} \rightarrow y = \frac{1}{2}x + 4$

$Y = \frac{1}{2}X + 4$

$\mathbb{R}$ or all real #'s

CHECK (PLUG IN SOLUTION):

Infinite solutions (same line)



Example 6:

SOLVE THE SYSTEMS OF EQUATIONS BY GRAPHING BY CALCULATOR

$(2/3)X - (5/3)Y = -(1/3)$

$-2/3x \qquad -2/3x$

$\frac{-5/3\,y}{-5/3} = \frac{-2/3\,x - 1/3}{-5/3}$

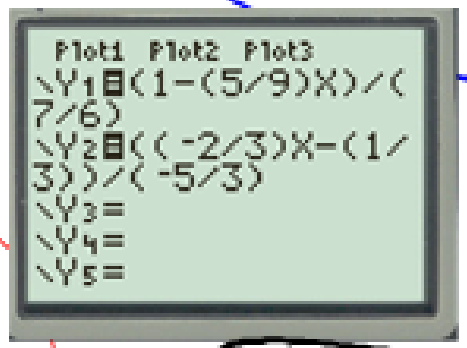
$y = \frac{(-2/3)x - (1/3)}{(-5/3)}$

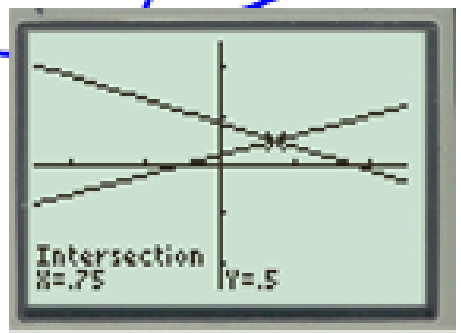
$(5/9)X + (7/6)Y = 1$

$-5/9x \qquad -5/9x$

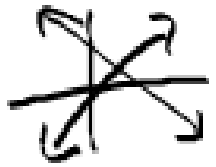
$\frac{7/6\,y}{7/6} = \frac{1 - 5/9x}{7/6}$

$y = \frac{(1 - (5/9)x)}{(7/6)}$





(.75, .5)



Lesson 9: (Sect 3.1) Graphing Systems of Equations

Objectives:

~ Graph two lines by hand (x and y int) and find the point of intersection - the solution.

~ Graph two lines on Calculator and find the point of intersection - the solution.

Can you?

A day: Assignment 9 Due next time (we are taking a quiz. Test 2 Review Worksheet is due on test day. You will have time to work on it next class period.

B day: Assignment 9 is Due next time (we are taking a quiz). Test 2 Review Worksheet is due on test day. You probably won't have much time to work on the worksheet in class.

Homework: Due next time

Review for Test 2 worksheet

Homework: Due class after test

Assignment 9

"New" part of *Assignment 9*

Pg 129: # 9, 11, 23-27 odd - NO calculator!

Instructions: Graph the system of equations and state its solution (point, no solution, infinite solutions).

Pg 129: #39, 41 and Pg 125: #5, 7 - You may use a Calculator.

Instructions: Write problem, Solve for y, write point (solution)

&

"Review" part of *Assignment 9* - Pay attention to when you *CAN* and *CANNOT* use a calculator.