Math 125

Spring 2022

Lecture 10

$$ax^2 + bx + c = 0$$
$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

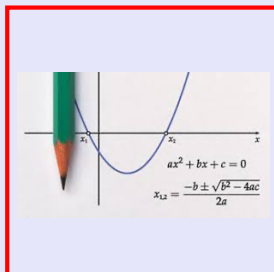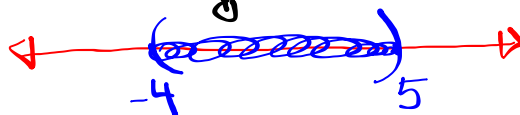
Class QZ 8

Solve $|2x-1| - 6 < 3$

Express final Ans in interval notation and graphing.

$|2x-1| < 9$ shade between

$|2x-1| = 9$

$2x-1 = 9$ OR $2x-1 = -9$

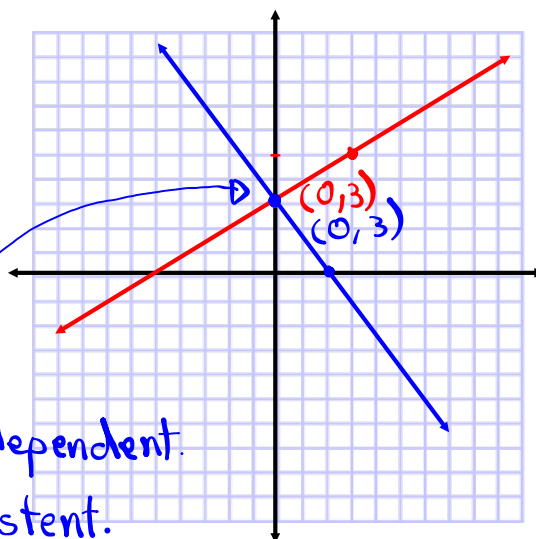$\boxed{x = 5}$ $\boxed{x = -4}$

I.N. $\Rightarrow$ $(-4, 5)$

S.BN. $\{x \mid -4 < x < 5\}$

Solve by graphing

$$y = \frac{2}{3}x + 3$$

$$y = \frac{-3}{2}x + 3$$

Solution $(0,3)$

Equations are independent.
System is consistent.

(0,3)
(0,3)

Solve by subs. method

$$5x - 2y = 8$$

$$y = 2x - 4$$

$$5x - 2(2x - 4) = 8$$

$$5x - 4x + 8 = 8$$

$$x + 8 = 8$$

$$x = 8 - 8$$

$$\boxed{x = 0}$$

$$y = 2(0) - 4$$

$$= 0 - 4$$

$$\boxed{y = -4}$$

Solution $(0, -4)$

when we have $\Rightarrow$ { Equations are independent
exactly one { System is consistent
Solution

Solve by addition method:

$$2\begin{cases} 3x + 2y = 7 \\ 2x - y = 0 \end{cases} \Rightarrow \begin{cases} 3x + 2y = 7 \\ 4x - 2y = 0 \end{cases}$$

$$\overline{7x = 7}$$

$$\boxed{x = 1}$$

$$2(1) - y = 0$$

$$2 - y = 0$$

$$\boxed{2 = y}$$

Solution $\left\{(1, 2)\right\}$

Equations are independent.

System is Consistent.

Solve by graphing:

$$\begin{cases} 3x + 2y = 6 \\ y = \dfrac{-3}{2}x - 4 \end{cases}$$

$$\begin{array}{c|c} x & y \\ \hline 0 & 3 \\ 2 & 0 \end{array}$$

Y-Int $(0, -4)$

$m = \dfrac{-3}{2}$
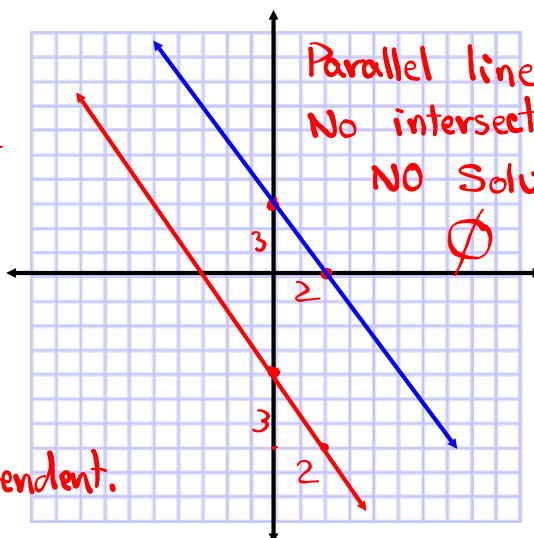
Parallel lines
No intersect
NO Solution
$\emptyset$

Equations are independent.

System is inconsistent.

Solve by Subs. method:

$$\begin{cases} 6x - 2y = 10 \\ y - 3x = -8 \end{cases}$$

Isolate one of the Variables

$$y = 3x - 8$$

$$6x - 2(3x - 8) = 10$$

$$6x - 6x + 16 = 10$$

$$16 = 10$$

$\emptyset$ — No Solution ← False

Independent equations, inconsistent System

Solve by addition Method!

$$-2\begin{cases} 3x + 2y = -8 \\ 6x + 4y = 16 \end{cases} \Rightarrow \begin{cases} -6x - 4y = 16 \\ 6x + 4y = 16 \end{cases}$$
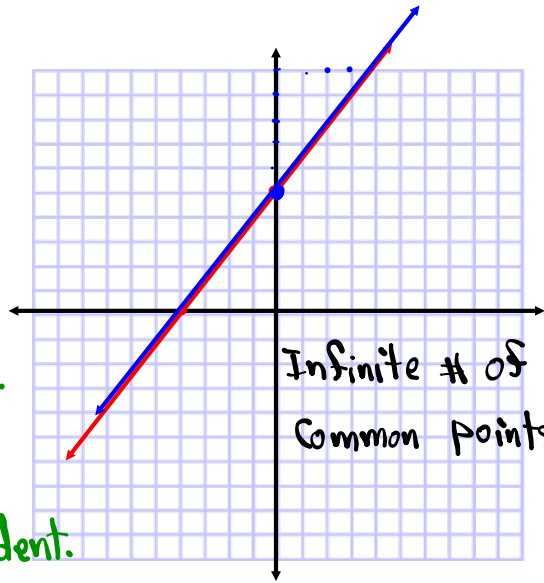
$$0 = 32$$

$\emptyset$ — No Solution ← False

Equations are independent.

System is inconsistent

Solve by graphing

$$\begin{cases} 5x - 4y = -20 \\ y = \frac{5}{4}x + 5 \end{cases}$$

Infinite # of Solutions.

System is Consistent.

Equations are dependent.

Infinite # of
Common points

Solve by Subs. method:

$$\begin{cases} 4x + 2\boxed{y} = 10 \\ \boxed{y} = \boxed{5 - 2x} \end{cases}$$

$$4x + 2(5 - 2x) = 10$$

$$\cancel{4x} + 10 - \cancel{4x} = 10$$

$$10 = 10$$

infinite # of Solutions ⟸ True

Equations are dependent

System is Consistent.

Solve by addition method:

$$2 \begin{cases} 3x - 2y = 9 \\ -6x + 4y = -18 \end{cases} \Rightarrow \begin{cases} 6x - 4y = 18 \\ -6x + 4y = -18 \end{cases}$$

$$0 = 0$$

Infinite # of Solutions $\Leftarrow$ True

System is Consistent.

Equations are dependent.

Tuesday Class QZ on Solving System of equations

Look for online QZ on Sunday Morning.

I only answer questions in my office hours.