

7.5 Special

Jan. 29, 2007

## Types of Linear Systems

Show that the Linear System  
has No Solution

$$3x + y = 6 \Rightarrow \text{equ. 1.}$$

$$3x + y = 1 \Rightarrow \text{equ. 2.}$$

Method 1: Check Slopes: <sup>Slope-Int form</sup> <sup>Solve for y</sup>

$$\text{equ. 1} \Rightarrow y = -3x + 6 \quad \text{Same Slope} \Rightarrow$$

$$\text{equ. 2} \Rightarrow y = -3x + 1 \Rightarrow \text{Diff. y-int} \Rightarrow \text{They are //}$$

Parallel ... There are no Solutions

Show that the Linear System  
has Infinitely Many Solutions.

$$\begin{array}{l} -2x + y = 3 \Rightarrow \text{equ. 1} \\ +2x \quad +2x \\ -4x + 2y = 6 \Rightarrow \text{equ. 2} \end{array}$$

Method 1: Slope-Int.

$$\text{equ. 1} \Rightarrow y = 2x + 3$$

$$\text{equ. 2} \Rightarrow y = 2x + 3$$

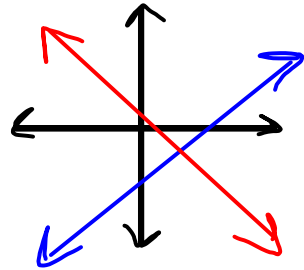
Solve for 'y'

Same equations  
Same Slope &  
y-int.

Same Equations... Infinitely Many  
Solutions

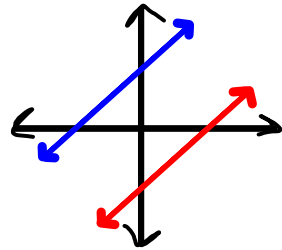
Summary:

3 Types: "Number of Solutions"



- 2 Diff. eq. w/ Diff. Slopes

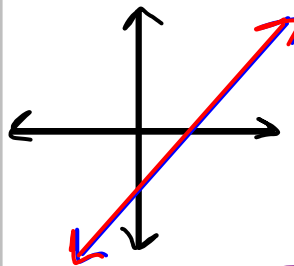
- Exactly One Solution



- 2 Equations: w/ Same Slope  
Diff. y-int.

→ Parallel Lines

- No Solution



- 2 Equ. w/ Same Slope +  
Same y-int.

→ Same Lines/Equations

- Infinitely Many Solutions.

O.T.L.

① Pg 421 : 20-22(all); 24-29  
(all)

Solve for  $y$

Say 1 Solution

No Solution

$\infty$  Many Solutions

if there is 1 Solution  
find that Solution!

Chapter  
test  
Wednesday