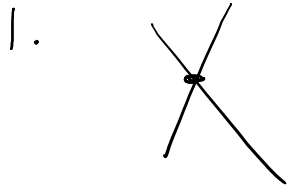


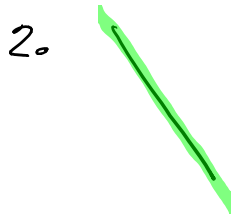
# Systems of Equations

Wednesday, October 25, 2017 11:09 AM

## Today Linear equations



Consistent  
independent



Constant  
dependent



inconsistent  
never meet  
parallel.

## Solve by substitution

system  $\left\{ \begin{array}{l} y = x + 2 \\ x + y = 8 \end{array} \right.$

substitute  
↓  
Replace  $y$  with  
the thing it is equal  
to.

→  $x + x + 2 = 8$

①

$$\begin{aligned} 2x &= 6 \\ x &= 3 \end{aligned}$$

2.

use  $x$  to find  $y$ .

use the other equation.

$$y = x + 2$$

$$y = 3 + 2$$

$$y = 5$$

$(3, 5)$

must be an ordered pair !!!

$$2x + y = 8$$

$$6x + 3y = 24 \quad \Leftarrow \quad \begin{array}{l} 3 \text{ times} \\ 1^{\text{st}} \text{ line.} \end{array}$$

Solve by substitution.

$$y = 8 - 2x$$

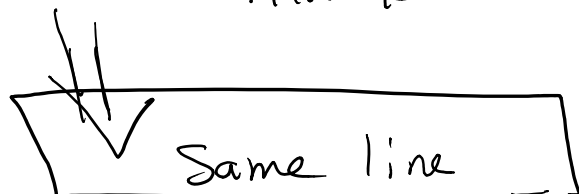
$$6x + 3y = 24$$

$$6x + 3(8 - 2x) = 24$$

$$6x + 24 - 6x = 24$$

$$24 = 24$$

Always true

 Same line

# 3 cases

1.  $\begin{cases} \end{cases}$

$x = 2$

$\Rightarrow$   
 $(2, 5)$

2.  $\begin{cases} \end{cases}$

$24 = 24$

Always true

Same line

3.  $\begin{cases} \end{cases}$

$0 = 7$

never true

parallel lines.

## Elimination

add together  $\left\{ \begin{array}{l} 2x + 3y = 34 \\ 4x - 3y = -4 \end{array} \right.$

$6x = 30 \Rightarrow$

$(5, 8)$

$x = 5$

$10 + 3y = 34$

$3y = 24$

$y = 8$

$3(2x + 4y = -10)$   
 $- 2(3x + 3y = -3)$

$6x + 12y = -30$

$-6x - 6y = 6$

$6y = -24$

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

$2x - 16 = -10$

$2x = 6$

$x = 3$

$(3, -4)$

$y = -4$

$$\begin{aligned} 2x &= 6 \\ x &= 3 \end{aligned}$$

$(0, 1)$

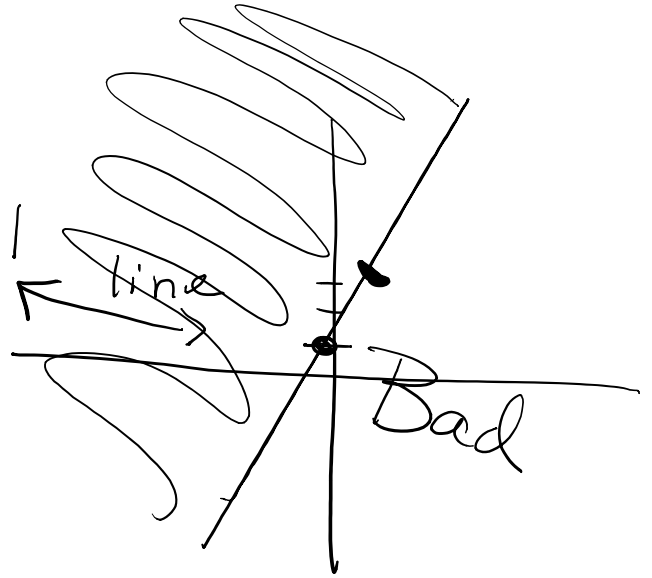
graph  $y = 2x + 1$

Related to

$$y \geq 2x + 1$$

half plane

line is divider.

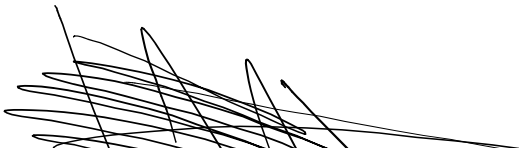


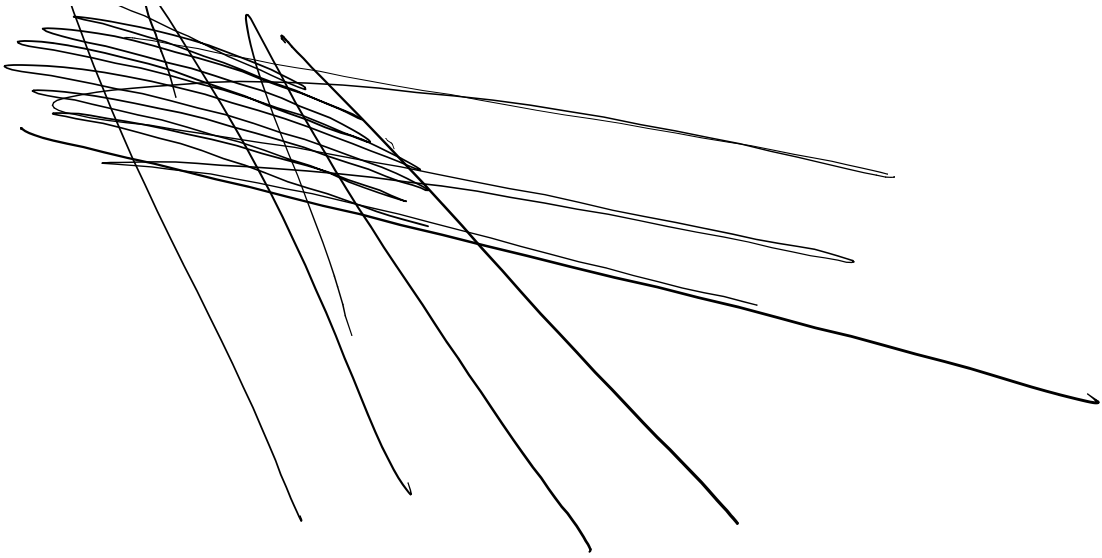
\* Pick a test point  $(0, 0)$   
if not on the line.

Plug in  $0, 0$  to the inequality

$$0 \geq 0 + 1 \quad \text{No.}$$

$(0, 0)$  is in the  
Bad side.





Shade a system.

graph the system

$$y \leq -2x + 4 \quad \text{solid line}$$

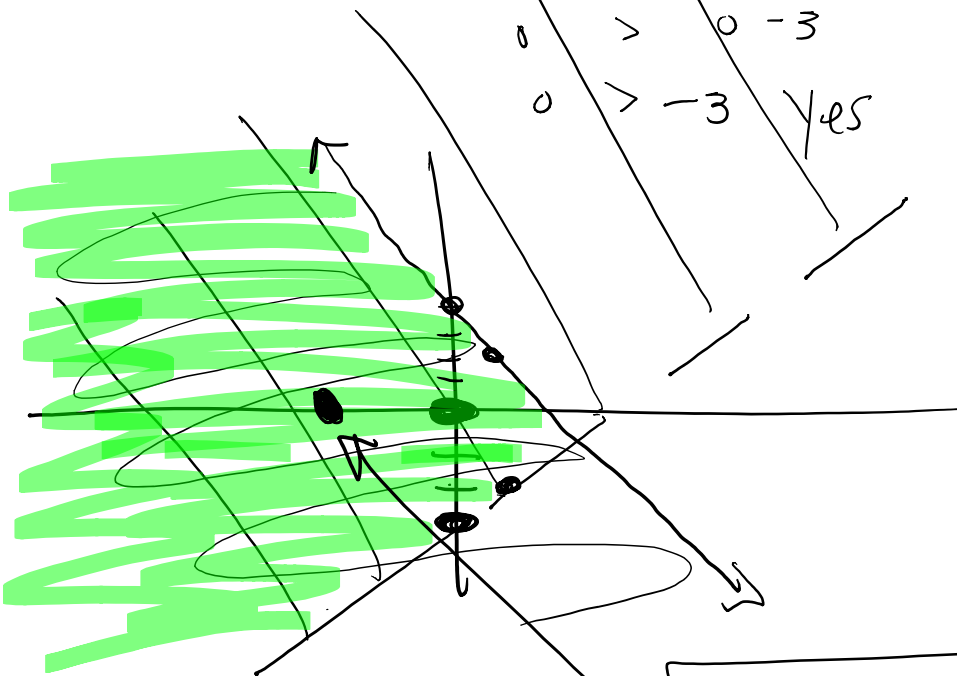
$$y > x - 3 \quad \text{dotted line.}$$

$$0 > -3 \quad \text{yes}$$

test(0,0)

$$0 \leq 0 + 4 \quad \text{yes}$$

$$0 \leq 4$$



$(-3, 0)$  is in the solution set.

3.2 : 15-31 odd  
32-34 all

3.3 : 16-19 also name two  
points in the solution  
set.

28-31, 34