Linear Equations and Inequalities
Lesson 4
Warmup

Graph

1) $5 = |x|$

2) $10 < 3|-2x + 2| + 1$

Linear Equations

FORM		
Slope Intercept	$y = mx + b$	$m = slope$ $b = y\ intercept$
Point Slope	$(y - y_1) = m(x - x_1)$	$m = slope$ $x_1 y_1 = point$

What are the two things you need for a linear equation?

Slope and a point.
OR
Two points

Given slope 2, and a point (-1,3), find the equation.

Plug into Point-Slope Equation	$(y - y_1) = m(x - x_1)$ $(y - 3) = 2(x + 1)$

We Try

Given slope 5, and a point (-4,1), find the equation.

Plug into Point-Slope Equation	$(y - y_1) = m(x - x_1)$

We Try

Given slope -10, and a point (-2,-3), find the equation.

Plug into Point-Slope Equation	$(y - y_1) = m(x - x_1)$

Finding slope from two points
Use the formula
Given (x_1, y_1) *and* (x_2, y_2)

$$slope = \frac{y_2 - y_2}{x_2 - x_2}$$

I Try:
(1,2), (3,4)

Identify the givens	$(1,2) = (x_1, y_1)$ $1 = x_1$ $2 = y_1$ $(3,4) = (x_2, y_2)$ $3 = x_2$ $4 = y_2$
Plug points into slope formula	
Simplify	

(3,4), (1,2)

We Try:

Identify the givens	
Plug points into slope formula	
Simplify	

Does it matter which point is (x_1, y_1) $or (x_2, y_2)$?

We Try:
(1,3),(2,9)

Identify the givens	
Plug points into slope formula	
Simplify	

We Try:

(-1,3),(2,-9)

Identify the givens	

Plug points into slope formula	
Simplify	

I Try:
Given 2 points (1,3), (2,6), find the equation.

Find Slope	
Plug a point and slope into Point Slope Form	

We Try:

Given 2 points (2,5), (-2,9), find the equation.

Find Slope	
Plug a point and slope into Point Slope Form	

We Try:

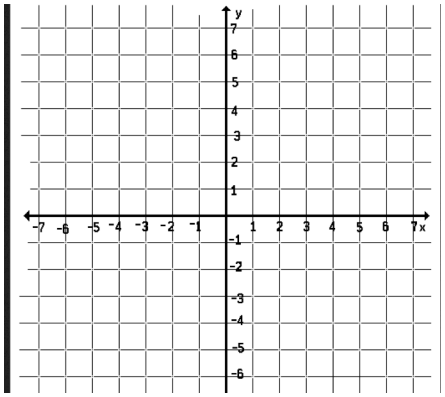
Given 2 points (3,0), (0,3), find the equation.

Find Slope	
Plug a point and slope into Point Slope Form	

I Try:
Graph the equation
$(y-2)=3(x-1)$

Plot 2 points
Connect the dots

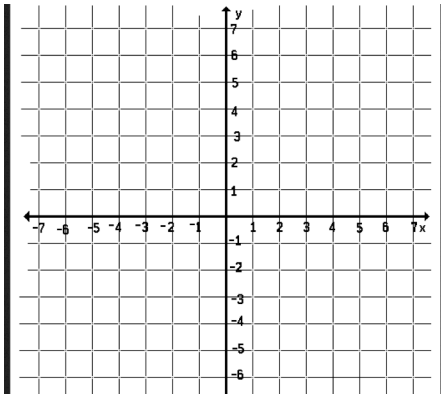
x	y



I Try:
Graph the equation
$y=3x-1$

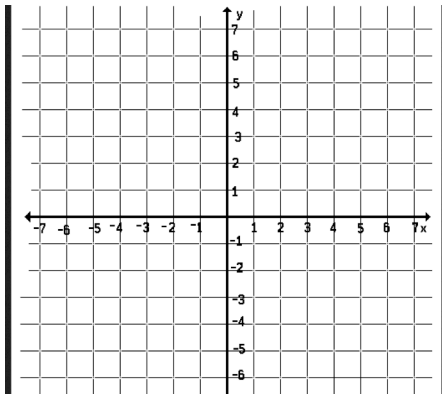
Plot 2 points
Connect the dots

x	y



We Try:
Graph the equation
$y = 2x - 5$

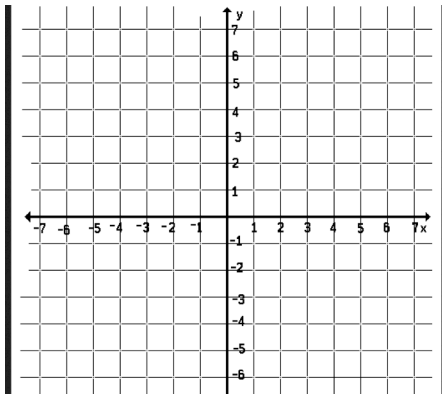
Plot 2 points
Connect the dots



x	y

We Try:
Graph the equation
$(y - 1) = -2(x + 1)$

Plot 2 points
Connect the dots



x	y

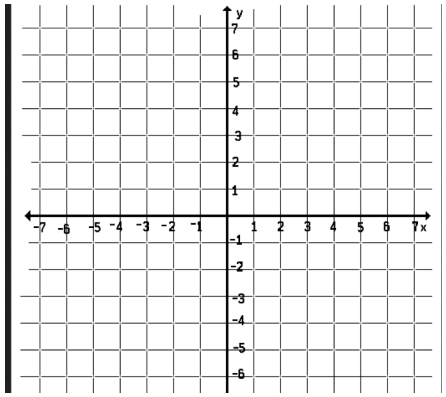
You Try:

Graph the equation

$y = -4x + 2$

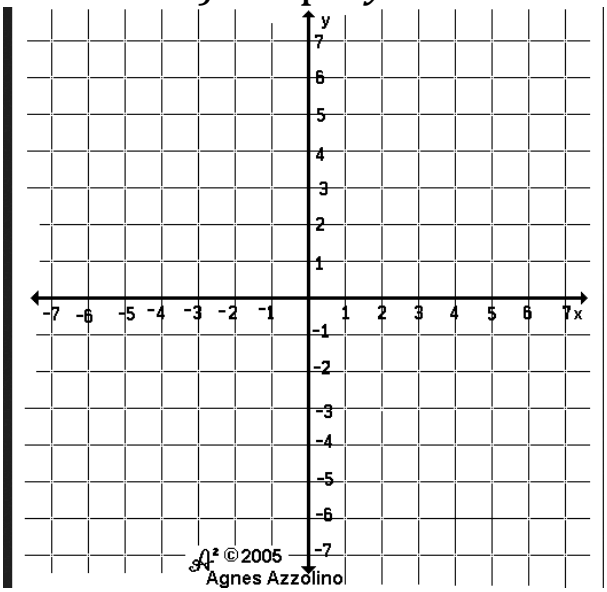
Plot 2 points
Connect the dots

x	y



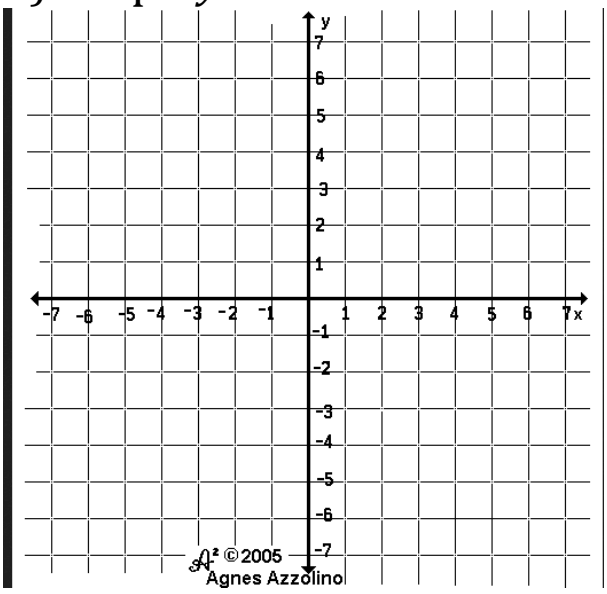
I Try:

1) Graph $y > x + 5$



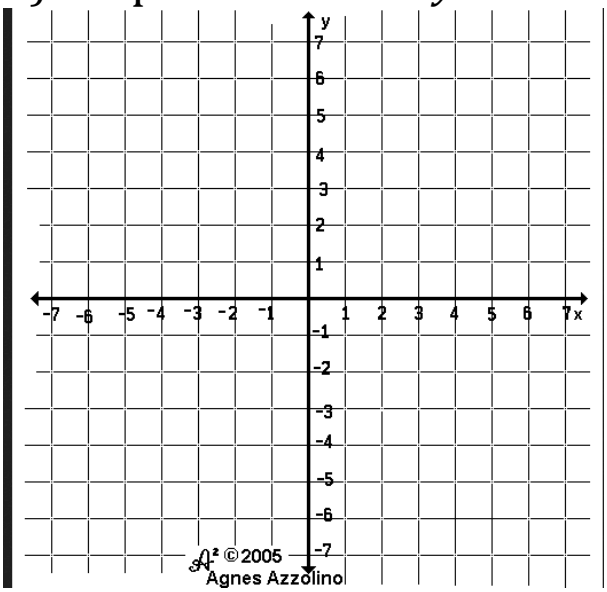
Graph as if it was a linear function	
Dotted line for $> or <$ Solid line for $\leq or \geq$	
Use the point (0,0) or another point not on the line to check where to shade	

2) Graph $y < 3x + 3$



Graph as if it was a linear function	
Dotted line for $> or <$ Solid line for $\leq or \geq$	
Use the point (0,0) or another point not on the line to check where to shade	

3) Graph $-2 < x + 2y < 4$



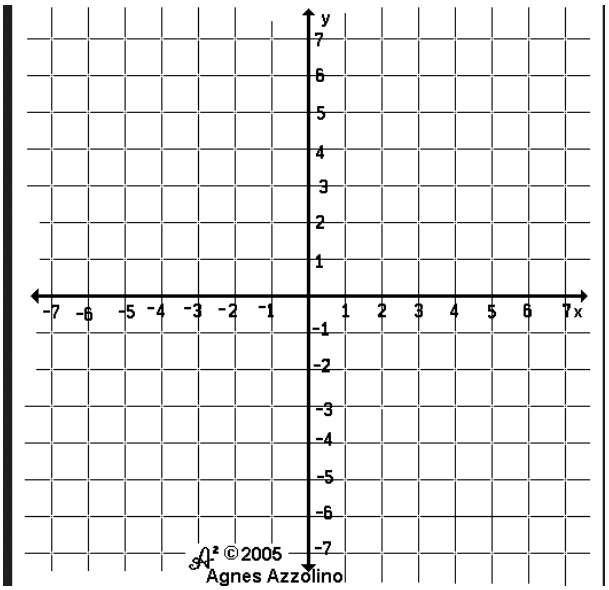
Graph as if it was a linear function	
Dotted line for $> or <$ Solid line for $\leq or \geq$	
Use the point (0,0) or another point not on the line to check where to shade	

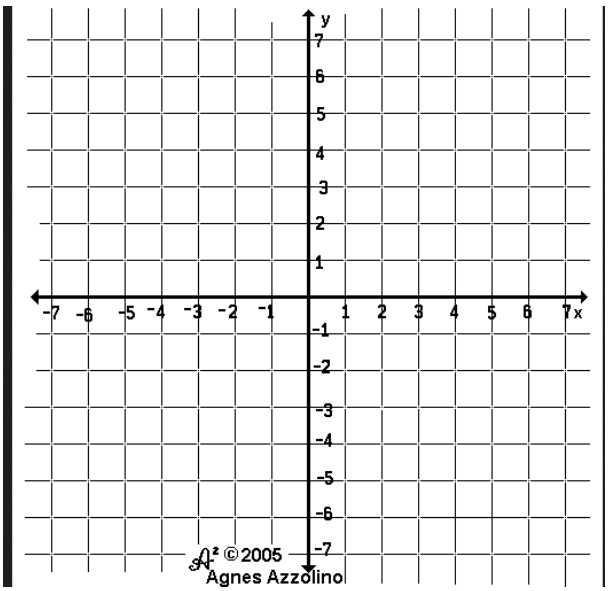
We Try:

Graph

1) $2x - 5y + 10 < 0$

2) $y < 2x + 3$





You Try with your partner:

1) $y > x + 3$

$y < -2x + 4$

Closure

Write down and number all of the steps on how to graph

$$-3 < \frac{1}{2}y + 3x < 4$$

Then sketch a graph!