

## Graphing Linear Inequalities

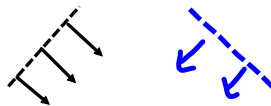
Here we will be graphing a region called a half plane. The region shaded will be determined by the inequality that is given.

Symbol:

Shaded Region:

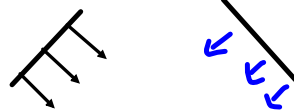
Meaning:

•  $<$



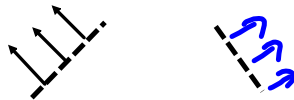
Less than

•  $\leq$



Less than or  
equal to

•  $>$



Greater than

•  $\geq$

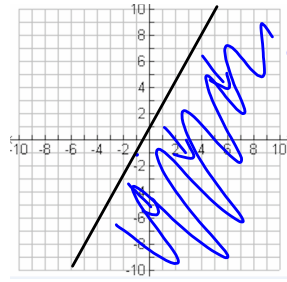


Greater than  
or equal to

Graph the following:

1)  $y \leq 2x + 1$

x	y
-1	-1
0	1
1	3

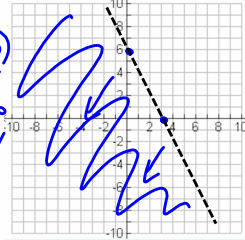


Test (0, 0)  
 $0 \stackrel{?}{\leq} 2(0) + 1$   
 $0 \leq 1 \checkmark$

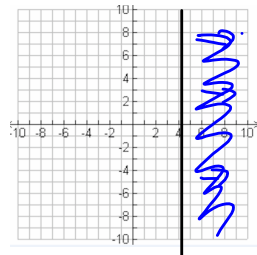
2)  $2x + y < 6$

x	y
0	6
3	0

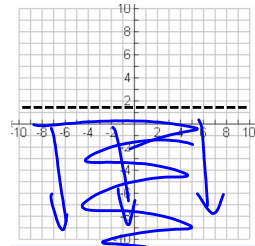
Test (0, 0)  
 $2(0) + 0 < 6$   
 $0 < 6 \checkmark$



3)  $x \geq 4$



4)  $y < 2$



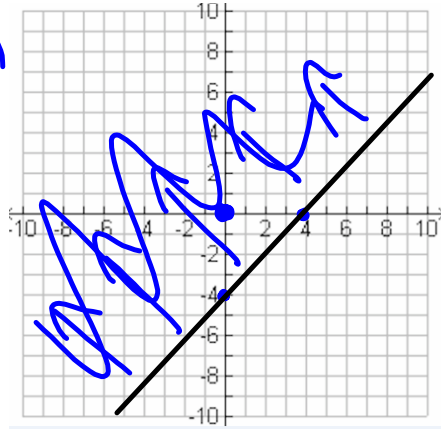
Special Case:

When  $y$  is **Negative** shade the opposite side!

1)  $x - y \leq 4$

x	y
0	-4
4	0

Test (0,0)  
 $0 - 0 \leq 4$   
 $0 \leq 4 \checkmark$



Why?

$$\begin{aligned}
 x - y &\leq 4 && \text{isolate "y"} \\
 -y &\leq -x + 4 && (\div -1) \\
 \frac{-y}{-1} &\geq \frac{-x + 4}{-1} \\
 y &\geq x - 4
 \end{aligned}$$