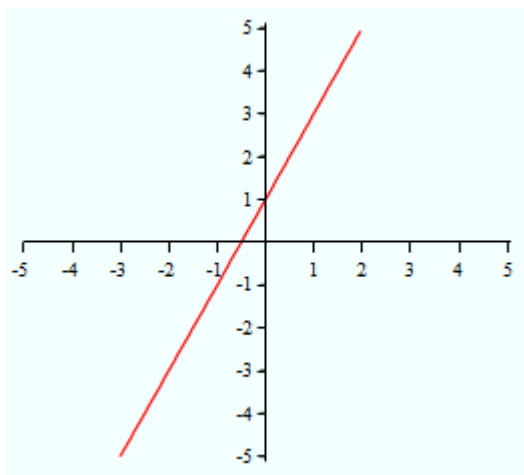


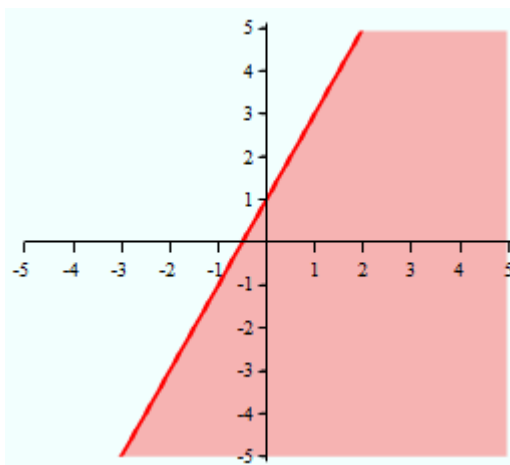
Lesson 10 – Two Variable First Degree Inequalities

The solution set of a line is any point on that line. This line also cuts the plane into two. The solution set of an inequality is a half-plane.

Ex. $y = 2x + 1$



$y \leq 2x + 1$



There are four possible signs for inequalities:

\leq *less than or equal to*

$<$ *less than*

\geq *greater than or equal to*

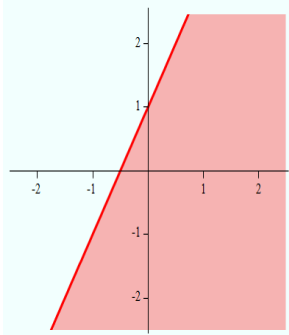
$>$ *greater than*

($<$ $>$ are dotted lines when graphed, and the points on the line are not part of the solution set)

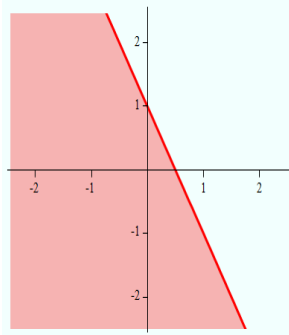
There are two ways of determining the solution set (ie shaded area):

1. Function form – when the equation is in function form then the solution set is above the line for $>$ and below the line for $<$.

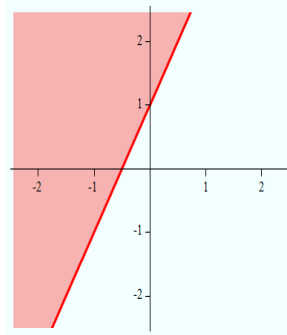
Ex. $y \leq 2x + 1$



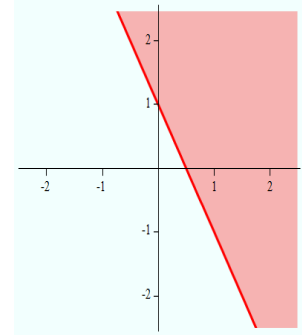
$y \leq -2x + 1$



$y \geq 2x + 1$



$y \geq -2x + 1$

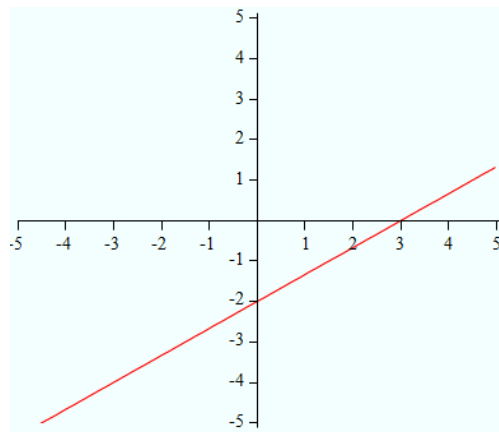


2. Check point – pick a point that is not on the line and plug it into your inequality. If the result is true then shade the half plane which contains the point, otherwise shade the other half plane.

Ex. Graph the following inequality: $2x - 3y \leq 6$

Step 1: Graph the line $2x - 3y = 6$

x	y
-3	-4
0	-2
3	0



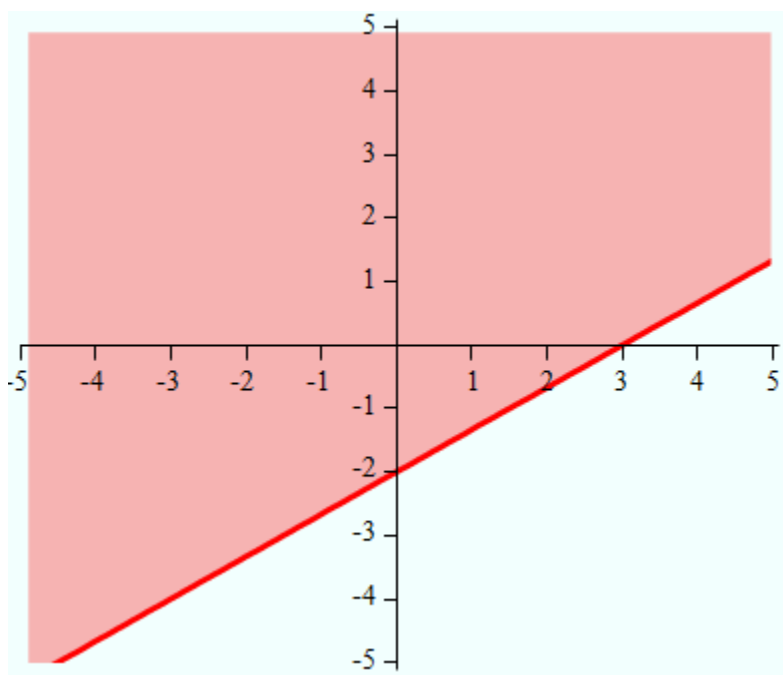
Step 2: Choose a point not on the line and plug it into the inequality. (If (0,0) is not on the line it is the best choice)

$$2x - 3y \leq 6$$

$$2(0) - 3(0) \leq 6$$

$$0 \leq 6 \quad \text{True}$$

Step 3: Shade – since (0,0) gave a true equation then the shading is on the same side as the point.

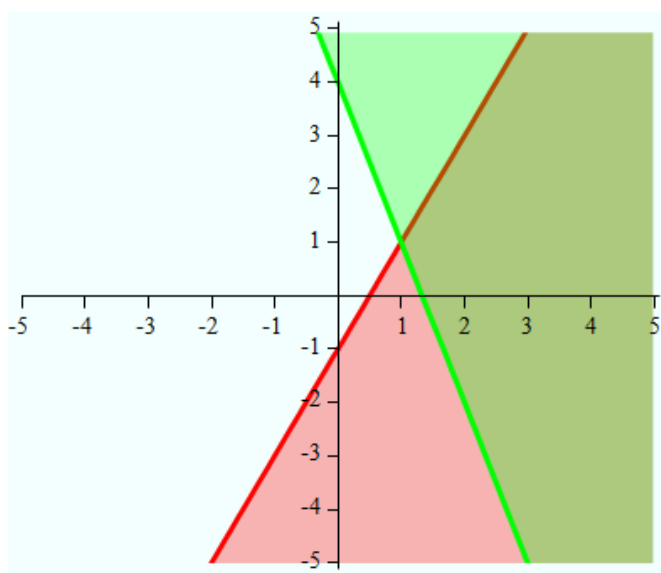


Finding the solution set of two or more inequalities

The solution set to two or more inequalities is the intersection of their individual solution sets.

Ex. Graph the solution set to the following system of inequalities: $y \leq 2x - 1$

$$y \leq -3x + 4$$



The solution set to this system is the dark green region.