**System of Inequalities**

* 2 or more inequalities will be given
* Solution Set (SS) must be done graphically on the Cartesian plane
* Solution Set (SS) is the common shaded area for all the inequalities given.

***Example #1***
 3x + 6y ≤ 18 & x > 2y – 3

**Step 1 – Change the inequalities into functional form (y=ax+b)**

3x + 6y ≤ 18 6y ≤ -3x + 18 $\frac{6y}{6}$ ≤ $\frac{-3x}{6}$ + $\frac{18}{6}$ y ≤ $\frac{-1x}{2}$ + 3

 x > 2y – 3 2y-3 < x 2y < x +3 $\frac{2y}{2}$ < $\frac{x}{2}$ + $\frac{3}{2}$ y < $\frac{x}{2}$ + 1.5

**Step 2 – Graph the inequalities using the inequality chart**

|  |  |  |  |
| --- | --- | --- | --- |
| Greater Than Symbol | > | Dotted Line | Shade Above the Line |
| Less Than Symbol | < | Dotted Line | Shade Below the Line |
| Less Than or Equal To Symbol | ≤ | Solid Line | Shade Below the Line |
| Greater Than or Equal to Symbol | ≥ | Solid Line | Shade Above the Line |



Example # 2

2x + 3y – 6 < 0 & Y ≥ 5x + 3

**Step 1 – Change the inequalities into functional form (y=ax+b)**

2x + 3y – 6 < 0 3y < -2x + 6 $\frac{3y}{3}$ < $\frac{-2x}{3}$ + $\frac{6}{3}$ y < $\frac{-2x}{3}$ + 2

Y ≥ 5x + 3

**Step 2 – Graph the inequalities using the inequality chart**

|  |  |  |  |
| --- | --- | --- | --- |
| Greater Than Symbol | > | Dotted Line | Shade Above the Line |
| Less Than Symbol | < | Dotted Line | Shade Below the Line |
| Less Than or Equal To Symbol | ≤ | Solid Line | Shade Below the Line |
| Greater Than or Equal to Symbol | ≥ | Solid Line | Shade Above the Line |



**Practice**

-2x + y < 1
3x + 2y > 9

3x + 4y +6 > 0
2x + y ≥ 1

2x ≤ 4
2x + 3y – 6 ≥ 0

x + 2y < 3
4y < -4