**Graphing an Inequality**

Y ≥ 5x + 2

**Step 1 – Make sure the equation is in functional form (y = ax + b)**

Y ≥ 5x + 2

If you have to change the inequality – if you divide by a negative number to reduce the “y” variable, you MUST flip the symbol.

Example:

-2y ≤ -10x -4 $\frac{-2y}{-2}$ ≤ $\frac{-10x-4}{-2}$ y $\geq $ 5x + 2

**Step 2 – Graph the inequality as though it were a regular equation**

**Step 3 – Determine the type of line and shading for the inequality**

|  |  |  |  |
| --- | --- | --- | --- |
| “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 |

Y ≥ 5x + 2



Example #2

2x + 3y – 6 < 0

**Step 1 – Make sure the equation is in functional form (y = ax + b)**

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

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

**Step 2 – Graph the inequality as though it were a regular equation**



**Step 3 – Determine the type of line and shading for the inequality**

|  |  |  |  |
| --- | --- | --- | --- |
| 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 |

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



Example #3

5x < -6y + 12

**Step 1 – Make sure the equation is in functional form (y = ax + b)**

NOTE – If you get a situation where the “y” is on the right hand side – MIRROR the equation. That means write the whole thing backwards without changing the signs.

Mirrored

5x < -6y + 12 = -6y + 12 > 5x

-6y + 12 > 5x 🡪 -6y > 5x – 12 🡪 $\frac{-6y }{-6}$> $\frac{5x}{-6}$ $\frac{-12}{-6}$ 🡪 y < $\frac{-5x}{6}$ + 2

**Step 2 – Graph the inequality as though it were a regular equation**



**Step 3 – Determine the type of line and shading for the inequality**



**Practice:**

Y > 4x – 8

3x – 4y ≤ 4

-10x ≤ 80y + 40