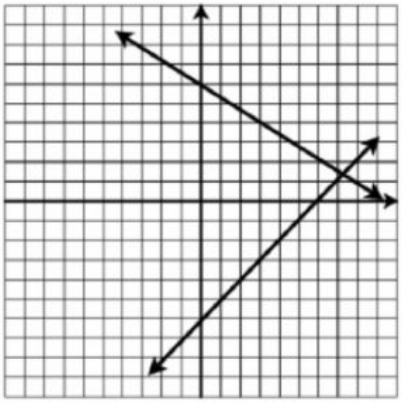
Directions:

In the board game "Battleship," you are required to guess the coordinates of your opponent's ship. What if you could use math to ensure that *every, single*, one of your "guesses" were perfect? Well, we will make this a reality by using linear inequalities!

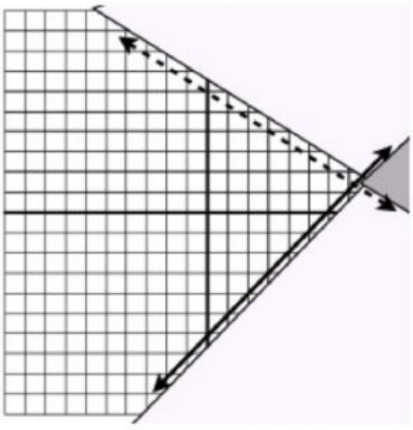
If given the inequalities $y > 6 - \frac{2x}{3}$ and $y \leq x - 6$. First, graph the lines as if the inequalities were equal signs.



Graphing inequalities and equations have slightly different requirements.

1.) Greater than and less than signs (> and <) require us to use dotted lines instead of solid lines.
2.) "Greater than" or "greater than or equal to" signs require us to shade above the line.
3.) "Less than" or "less than or equal to" signs require us to shade below the line.

Our new lines will look like this.



Now, back to the Battleship! You can see the small double-shaded part on the right side of the graph. If you choose a point within that section, you will have a true statement for both inequalities! For example, (10, 2) is located in that region.

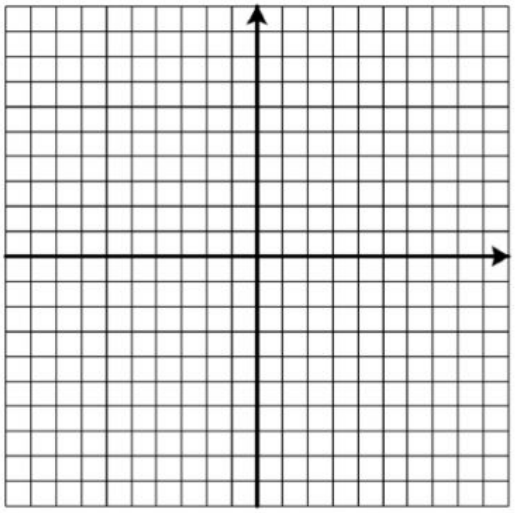
We can input (10, 2) into both of our Inequalities and have true statements.

$(2) > 6 - \frac{2(10)}{3}$ and $(2) \leq (10) - 6$

$2 > -\frac{2}{3}$ and $2 \leq 4$. Both true!

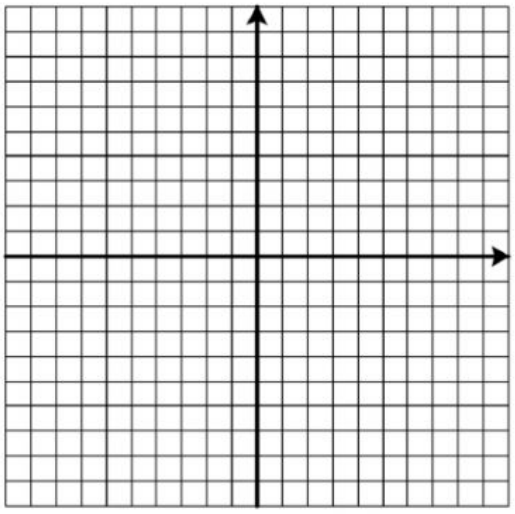
Graph the following lines and determine an ordered pair that would sink your opponent's Battleship!:

1.) $y < \frac{x}{3} + 1$ and $x \leq -3$



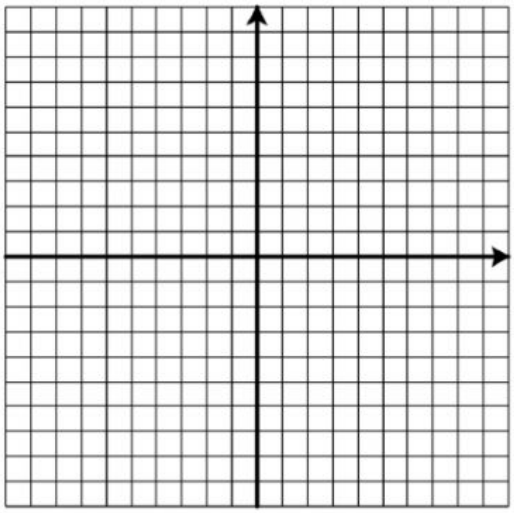
Answer: (,)

2.) $y > 2$ and $y > 2x - 1$



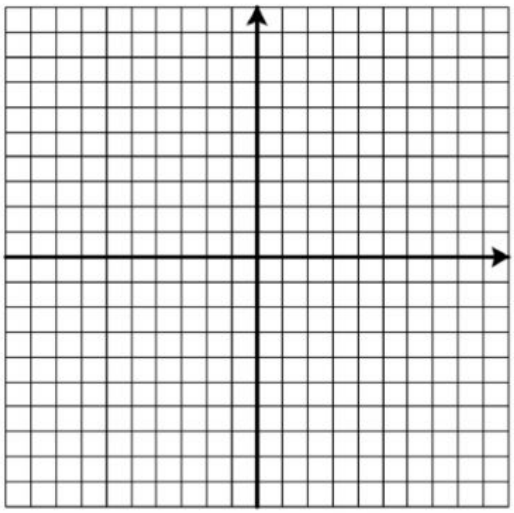
Answer: (,)

3.) $x < 3$ and $y > x - 2$



Answer: (,)

4.) $y \leq -\frac{x}{3} - 4$ and $y \leq 3x - 2$



Answer: (,)