Unit 2: Solving Equations and Inequalities
Lesson 3: Graphing Linear Inequalities

You and three friends go to lunch at Chick-fil-a. Between the three of you, you have $15 to spend. How much can you buy? Come up with 2 or 3 different options. (A small soda is $1.45 and 8 piece nuggets are $2.95)

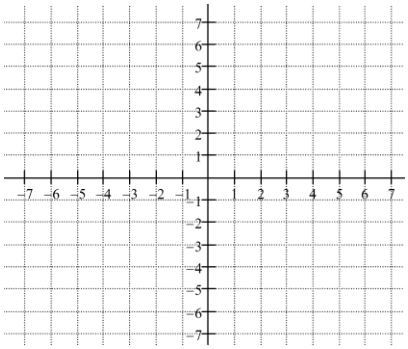
Soda	Chicken	Total

How many different options do you have (total)?

Write an equation that would represent each of your options.

The solution set of an **equation** is every point on the line. For an **inequality**, the solution set includes the area of the graph separated by the line.

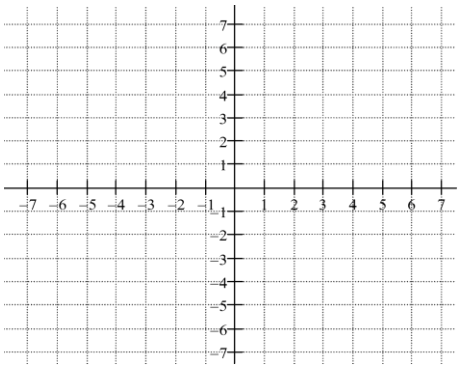
Graph this equation: $y = 2x + 1$



Now consider $y \leq 2x + 1$.
Mark 3 additional points that would be solutions to $y \leq 2x + 1$.

We represent the solutions that are not on the line by shading the area of the graph that makes the inequality true.

Graph the inequality: $y \leq 2x + 1$



Practice: Determine if the following points are solutions to the function.

1. $y > 3x + 4$ $(2,-4)$

2. $y \leq \frac{1}{2}x - 3$ $(-4,3)$

3. $x + 3y < -4$ $(1,0)$

4. $2x - 3y > 6$ $(5,-2)$

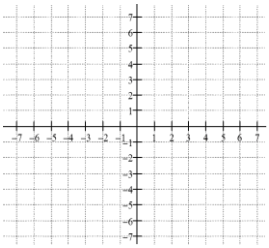
STEPS TO GRAPHING INEQUALITIES:

1. Graph the line.
2. Decide if the line is going to be solid or dotted.
   - When graphing $\leq$ or $\geq$, the line is solid.
   - When graphing $<$ or $>$, the line is dotted.
3. Pick a test point.
   - You must pick a test point that is NOT on your line.
   - The easiest test point is $(0,0)$. If $(0,0)$ is on your line; pick another point.

PRACTICE

Graph these inequalities:

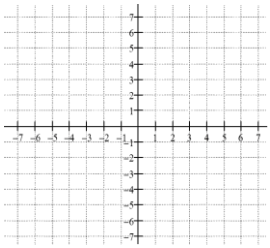
$x + y > -5$



Test point:

Is it a solution?

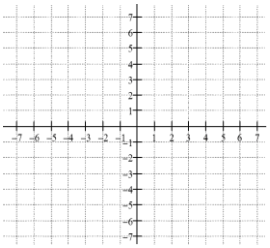
$x - 3y \leq 3$



Test point:

Is it a solution?

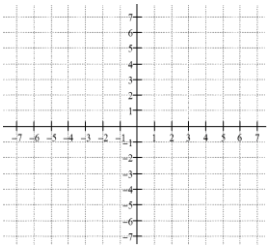
$y > \frac{-1}{4}x + 3$



Test point:

Is it a solution?

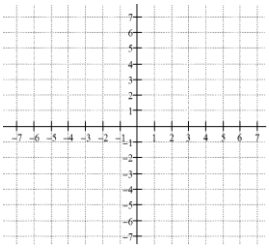
$x - 6y + 3 > 0$



Test point:

Is it a solution?

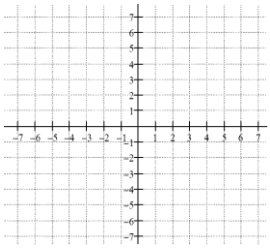
$y > 3x$



Test point:

Is it a solution?

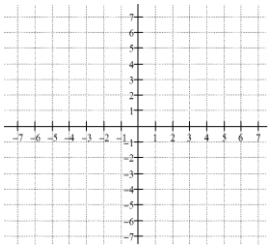
$3x - 2y > 6$



Test point:

Is it a solution?

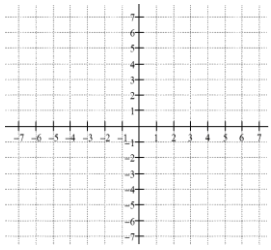
$y > 2x - 1$



Test point:

Is it a solution?

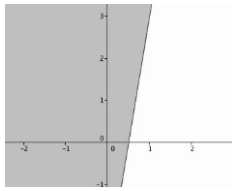
$4x - 2y - 8 > 0$

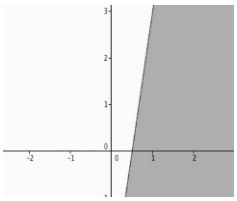


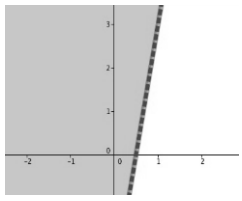
Test point:

Is it a solution?

Which is the correct graph for $y \geq 6x - 3$?

a. 

b. 

c. 

d.