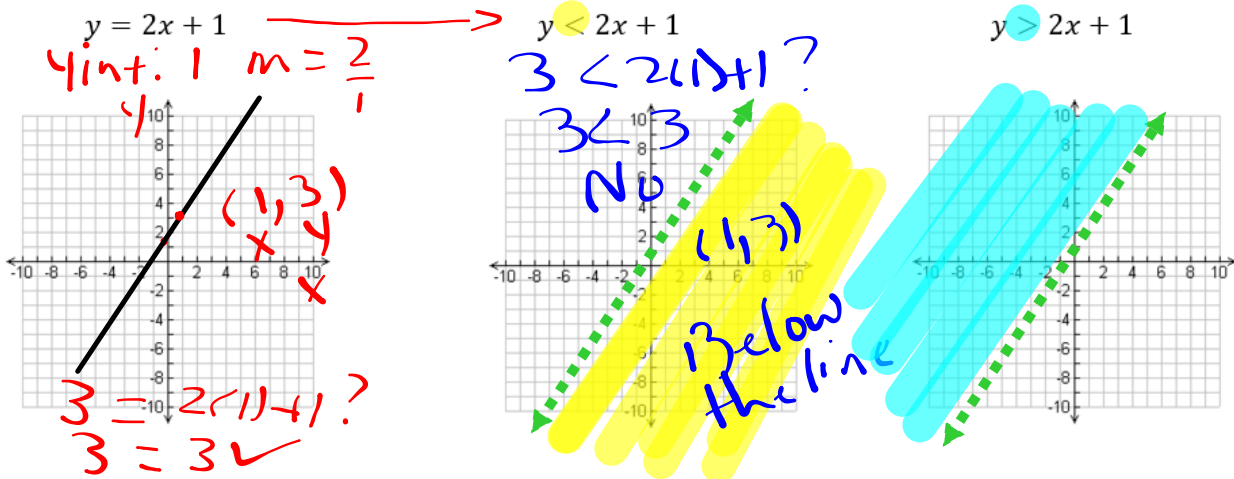


Graphing Inequalities **Jan. 30, 2020**

What is the difference among these equations?



What do these symbols represent?

\leq Less than or equal to
 $<$ Less than

\geq Greater than or equal to
 $>$ Greater than

$$y = 3x - 8 \quad y\text{int: } -8 \quad \circ$$

$$m = \frac{3}{1}$$

Example 1: $y \leq 3x - 8$

Step 1: Draw the line (solid or dotted?)

Step 2: Shade the feasible region (area that represents ALL the possible solutions).

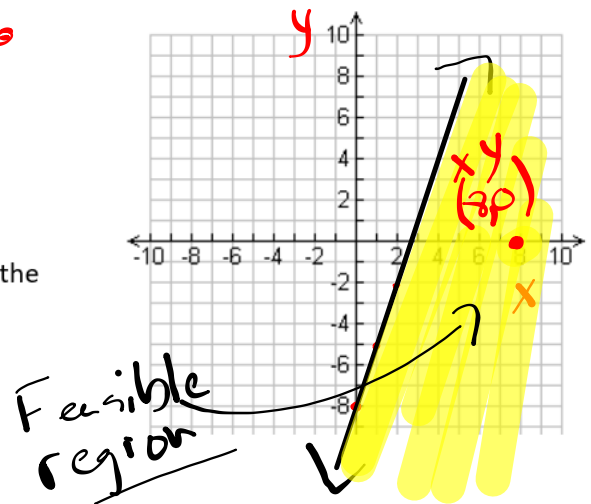
Step 3: Verify your solution by using a test point.

$$y \leq 3x - 8$$

$$0 \leq 3(8) - 8$$

$$0 \leq 16$$

$$\text{Yes } \checkmark$$



$$2y + 6x \leq 26x$$

$$2y = -6x + \frac{2}{2}$$

Example 2: $2y + 6x < 2$

x int: $x = \frac{1}{3}$

y int: $y = 1$

$$y = -3x + 1$$

$b = +1$

$m = -\frac{3}{1}$

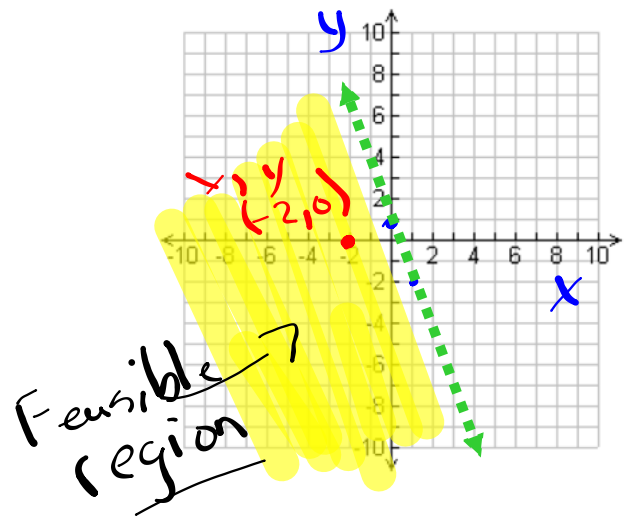
Verify

$$2(0) + 6(-2) < 2 ?$$

$$0 - 12 < 2 ?$$

$$-12 < 2 ?$$

Yes!

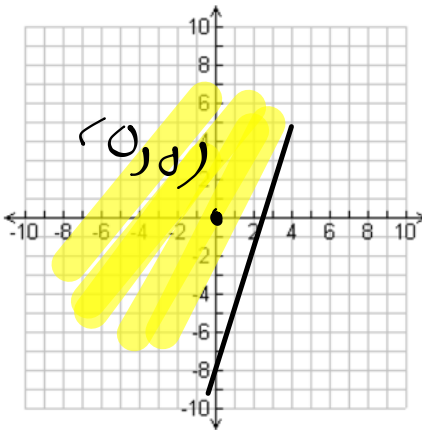


Your turn:

$$y \geq 3x - 8$$

$$0 \geq -8?$$

✓



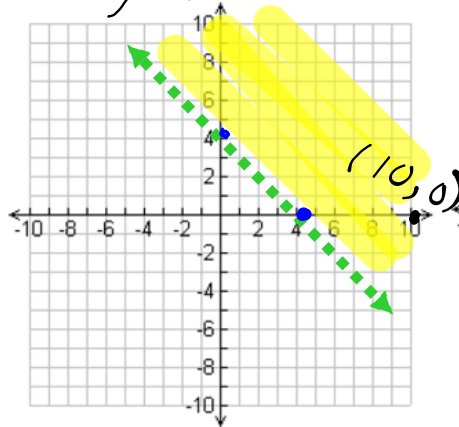
$$y > -x + 4$$

$$x + y > 4$$

$$10 + 0 > 4?$$

$$10 > 4?$$

yes

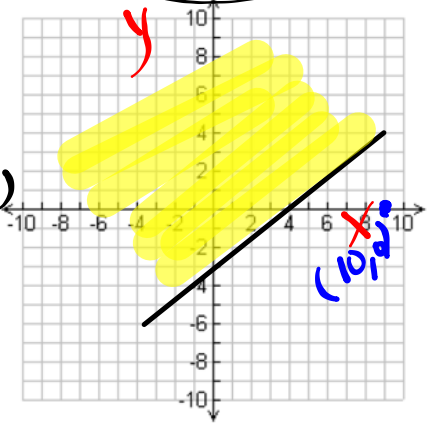


$$3x - 4y = 12$$

$$3x - 4y \leq 12$$

X int: $x = 4$

Y int: $y = -3$



Solve these inequalities:

1) $x - 2 \leq 7 + 2$

$$x \leq 9$$

2) $-4x \geq 12$

$$\frac{-4}{-4} = \frac{12}{-4}$$

$$x \leq -3$$

3) $4 - 2x > 6$

$$\frac{-4}{-2} = \frac{2}{-2}$$

$$\frac{-2}{-2} = \frac{-2}{-2}$$

$$x < -1$$

Your turn:

4) $3x + 6 > 12$

$$x > 2$$

$$\frac{3x}{3} > \frac{6}{3}$$
$$x > 2$$

5) $6 < 2x + 16$

$$x \geq -5$$

$$\frac{-10}{2} = \frac{2x}{2}$$
$$-5 \leq x$$

6) $-x - 5 > 3$

$$x < -8$$

$$\frac{-x}{-1} > \frac{+8}{-1}$$
$$x < -8$$

Determine the coordinates that will satisfy this inequality: $y \geq 3x - 5$

(-3, 6) (-1, -7) (2, 2) (10, 5)

x, y

$$-7 \geq 3(-1) - 5 \quad 6 \geq 3(-3) - 5?$$

$$\underline{-7 \geq -8?} \quad 6 \geq -14?$$

Your turn: $2x < y + 3$

(-5, -12) (4, 5) (-3, -4)

**Practice**

1. Explain WHEN you should use a dotted line :
2. Solve these inequalities.
a) $x + 3 \leq 5$ b) $m - 6 \geq -1$ c) $-y > 10$ d) $-5y < 40$ e) $-6x \leq -48$
3. Given $y < 3x + 5$, which coordinate(s) are part of the feasible region?
(-1, -3) (-1, 2) (-4, 3) (-2, -3) (3, 1) (1, 5) (0, 5)
4. For each inequality, determine if the coordinate is within the feasible region.
a. (2, 1) and $2x + y > 5$ b. (-1, 3) and $2x - 4y \leq -10$
c. (2, -3) and $2y < -3x + 1$ d. (-5, -1) and $y > -2x + 8$
e. (-3, 0) and $4x - 5y + 8 \leq 0$ f. (6, 2) and $2x + 3y \geq -2$
g. (-4, -2) and $-3x > 2y - 6$ h. (5, -6) and $2y < 3x + 3$