

# Today's Plan:

**Learning Target (standard):** I will graph linear inequalities and describe their solution sets.

**Students will:** Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

**Teacher will:** Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

**Assessment:** Board work, homework check and homework assignment

**Differentiation:** Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

p.291 #60-112 (by 4)

$$60)x = 3$$

$$64)y = 3x - 11$$

$$68)y = -\frac{2}{3}x + \frac{20}{3}$$

$$72)y = 3$$

$$76)y = -\frac{6}{5}x - \frac{7}{5}$$

$$80)y = -\frac{1}{2}x - \frac{7}{2}$$

84)yes

88)no

92)no

96)no

$$100)y = -3x + 11$$

$$104)y = 2x + 5$$

$$108)y = \frac{3}{2}x - \frac{17}{2}$$

$$112)y = -\frac{3}{2}x + 2$$

Find the equation of the line in standard form.

$$(2, 3); m = \frac{1}{3}$$

$$y = mx + b$$

$$3 = \frac{1}{3}(2) + b$$

$$3 = \frac{2}{3} + b$$

$$b = \frac{7}{3}$$

$$y = \frac{1}{3}x + \frac{7}{3}$$

$$-3 \left[ -\frac{1}{3}x + y = \frac{7}{3} \right]$$

$$x - 3y = -7$$

Find the equation of the line in standard form.

$$(-1, 2) \text{ \& } (-2, 4)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 2}{-2 - (-1)} = \frac{2}{-1}$$

$$m = -2$$

$$y = mx + b$$

$$2 = -2(-1) + b$$

$$2 = 2 + b$$

$$b = 0$$

$$y = -2x$$

$$2x + y = 0$$

Find the equation of the line in standard form.

$$Ax + By = C$$

$$(3, -2) \text{ \& } (5, 1)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - (-2)}{5 - 3} = \frac{3}{2}$$

A(+)  
no fractions

$$m = \frac{3}{2}$$

$$y = mx + b$$

$$1 = \frac{3}{2}(5) + b$$

$$1 = \frac{15}{2} + b$$

$$b = -\frac{13}{2}$$

$$y = \frac{3}{2}x - \frac{13}{2}$$

$$-2 \left[ -\frac{3}{2}x + y = -\frac{13}{2} \right]$$

$$3x - 2y = 13$$

Find the equation of the line with the given conditions.

thru  $(-2, 3)$

$$m_{//} = \frac{2}{5}$$

parallel to

$$y = mx + b$$

$$3 = \frac{2}{5}(-2) + b$$

$$3 = -\frac{4}{5} + b$$

$$b = \frac{19}{5}$$

~~$$2x - 5y = 3$$~~

~~$$-5x = -2x + 3$$~~

~~$$x = \frac{2}{5}x - \frac{3}{5}$$~~

~~$$m = \frac{2}{5}$$~~

$$y = \frac{2}{5}x + \frac{19}{5}$$

Find the equation of the line with the given conditions.

thru  $(3, -4)$

$$m_{\perp} = -\frac{3}{4}$$

perpendicular to

$$-4x + 3y = -6$$

$$y = mx + b$$

$$-4 = -\frac{3}{4}(3) + b$$

$$-4 = -\frac{9}{4} + b$$

$$b = -\frac{7}{4}$$

$$y = -\frac{3}{4}x - \frac{7}{4}$$

$$4\left[\frac{3}{4}x + y = -\frac{7}{4}\right]$$

$$3x + 4y = -7$$

$$3y = 4x - 6$$

$$y = \frac{4}{3}x - 2$$

$$m = \frac{4}{3}$$

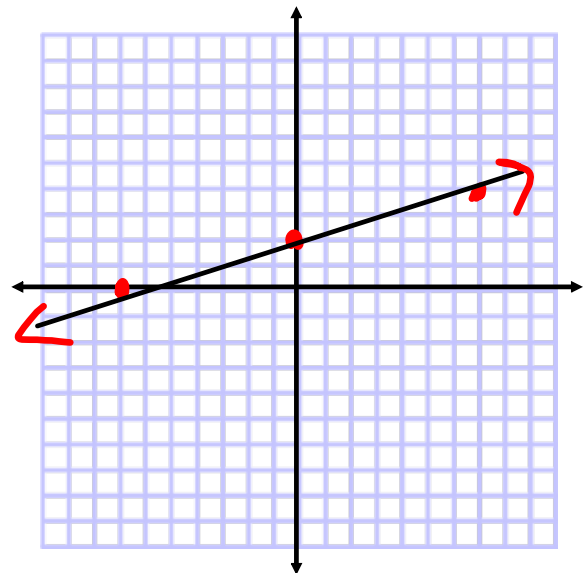
Graph using a  $t$ -chart.

$$-2x + 7y = 14$$

$$7y = 2x + 14$$

$$y = \frac{2}{7}x + 2$$

| x  | y |
|----|---|
| -7 | 0 |
| 0  | 2 |
| 7  | 4 |



Graph using the intercept method.

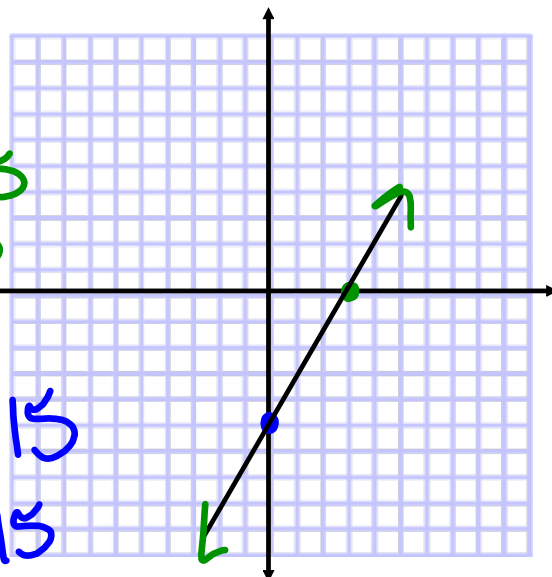
$$5x - 3y = 15$$

$$I_x: (3, 0)$$

$$\begin{aligned}5x - 3(0) &= 15 \\5x &= 15 \\x &= 3\end{aligned}$$

$$I_y: (0, -5)$$

$$\begin{aligned}5(0) - 3y &= 15 \\-3y &= 15 \\y &= -5\end{aligned}$$



Graph using the slope-intercept method.

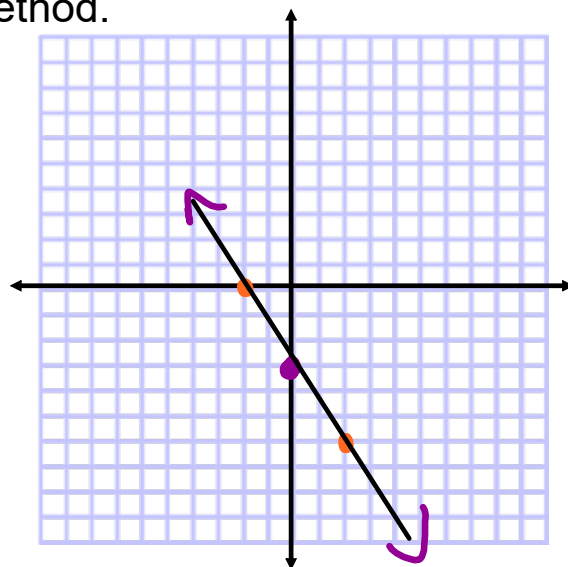
$$6x + 4y = -12$$

$$4y = -6x - 12$$

$$y = -\frac{3}{2}x - 3$$

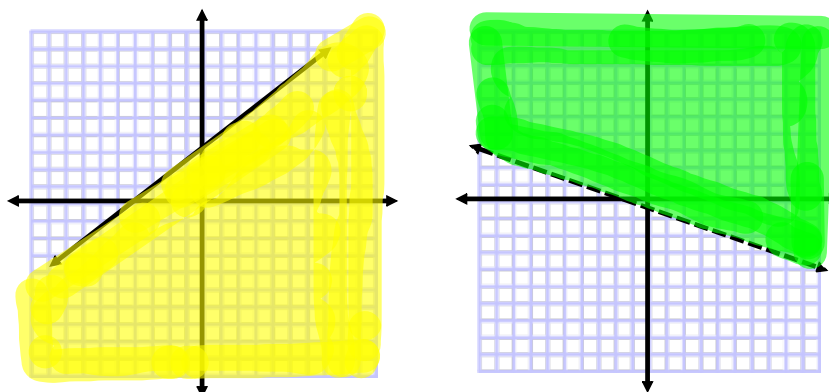
$$m = -\frac{3}{2}$$

$$I_y: (0, -3)$$



## Linear Inequalities:

- the set of ordered pairs that make an inequality true is the *solution set* of the inequality



## Procedure

- Choose a method to graph the “line”
  - T-chart (one negative, 0, and one positive)
  - Slope-intercept (slope and the y-intercept)
  - Intercepts (x-intercept and y-intercept)

## Next Step

- Look at the inequality symbol and decide whether the line is “open” or “closed”
  - “open” is a dotted line
  - “closed” is a solid line
- Graph the solid or dotted line

## Final Step

- Choose a “test point” not on the line and decide whether this makes the inequality “true” or “false”
- If “true” shade where the test point is located
- If “false” shade the opposite location

Graph.

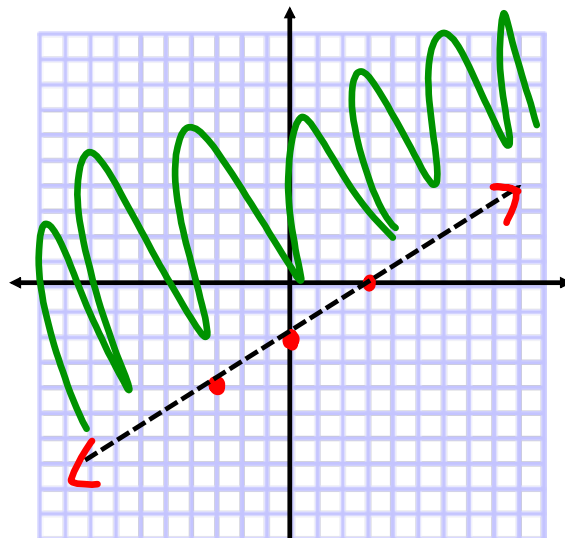
$$2x - 3y < 6$$

$$-3y < -2x + 6$$

$$y > \frac{2}{3}x - 2$$

$$m = \frac{2}{3}$$

$$I_y: (0, -2)$$


 $\begin{matrix} \leq \\ \geq \end{matrix}$  -dotted

 $\begin{matrix} \leq \\ \geq \end{matrix}$  -solid

Graph.

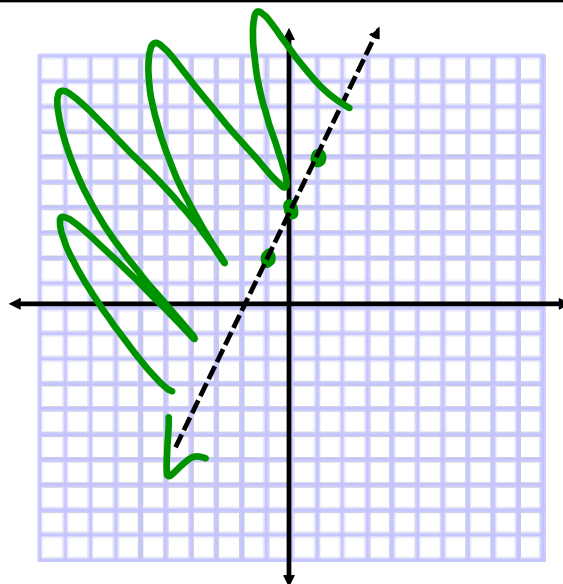
$$-4x + 2y > 8$$

$$2y > 4x + 8$$

$$y > 2x + 4$$

$$m = 2$$

$$I_y: (0, 4)$$



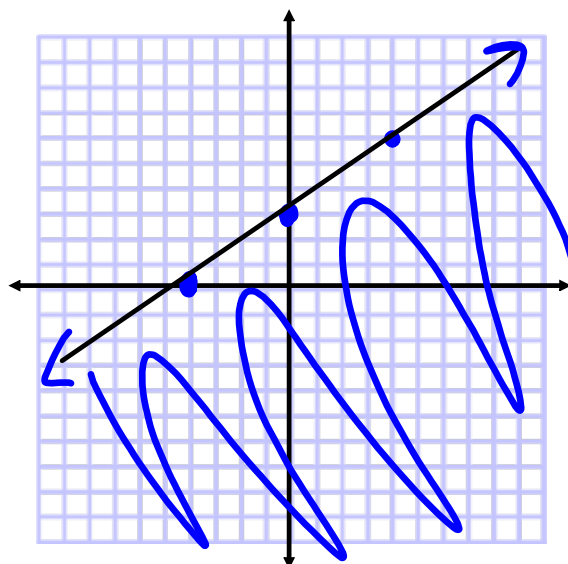


Graph.

$$y \leq \frac{3}{4}x + 3$$

$$m = \frac{3}{4}$$

$$I_y: (0, 3)$$



Assignment:

p.302 #2-26 even