Do Now!!!!

1. $12p \leq 15$

2. $4 + t > 17$

3. $5 - 2t \geq 11$

4. $|4c| = 18$

5. $|2h| \geq 7$

Algebra 2

Ch. 2 Handout 2.7

Linear Inequalities

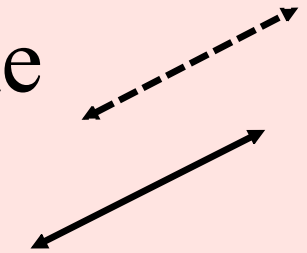
A **linear inequality** is an inequality in two variables whose graph is a region of the coordinate plane that is bounded by a line.

To **graph** a linear inequality first graph the boundary line. Write the equation in slope-intercept form ($y = mx + b$).

If an inequality is solved for y and y is on the left hand side then $>$ or $\geq$ means the y-values must be greater than those on the boundary lines and $<$ or $\leq$ means the y-values must be less than those on the boundary lines.

$>$ or $<$ dashed boundary line

$\geq$ or $\leq$ solid boundary line



Graph each inequality.

1. $y > \frac{1}{2}x - 1$

$m = \frac{1}{2}$

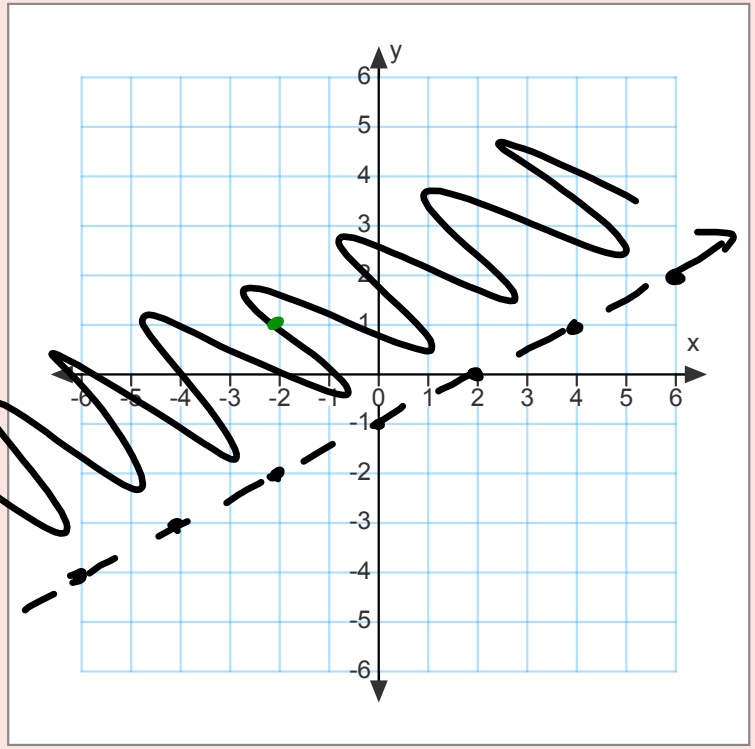
$b = -1$

Check: (-2, 1)

$y > \frac{1}{2}x - 1$

$1 > \frac{1}{2}(-2) - 1$

$1 > -1 - 1$



Graph each inequality

2. $2x + 3y \leq 6$

$3y \leq -2x + 6$

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

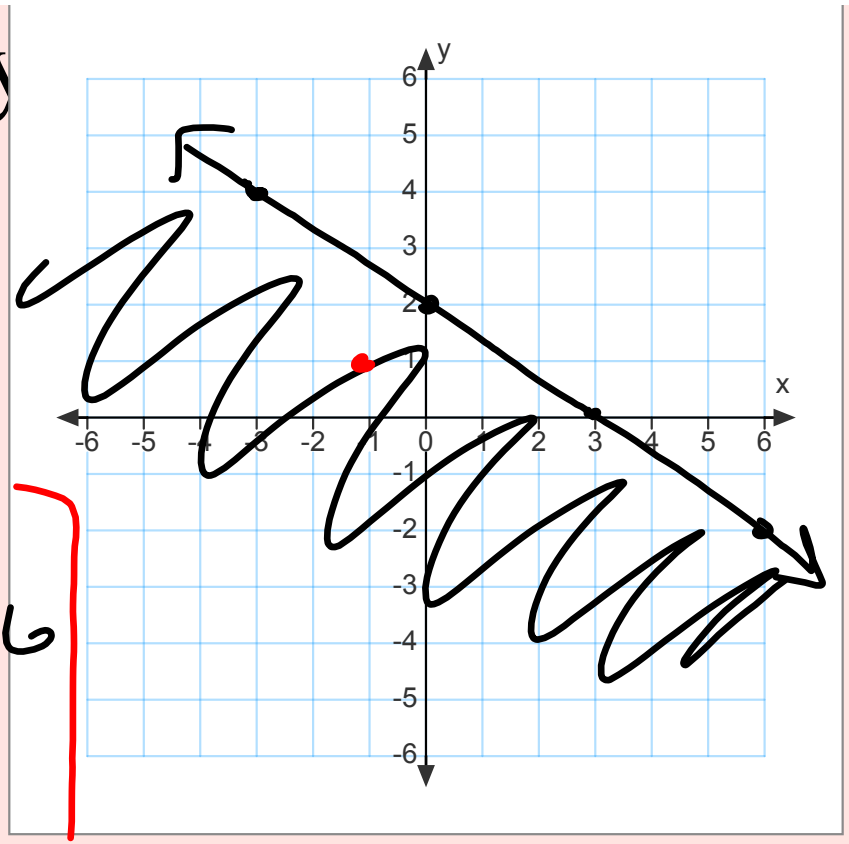
$m = -\frac{2}{3}$

$b = 2$

Check: (-1, 1)

$2(-1) + 3(1) \leq 6$

$-2 + 3 \leq 6$



Graph each inequality.

3. $-3x - 2y > 2$

$+3x \qquad +3x$

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

$y < -\frac{3}{2}x - 1$

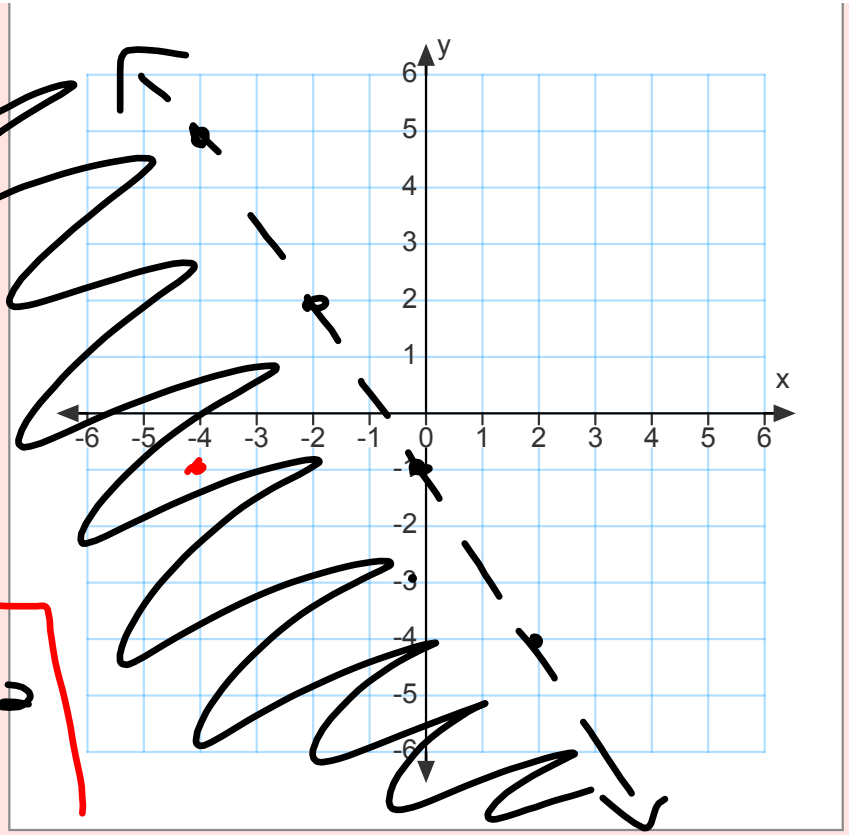
$m = -\frac{3}{2}$

$b = -1$

Check: $(-4, -1)$

$-3(-4) - 2(-1) > 2$

$12 + 2 > 2$



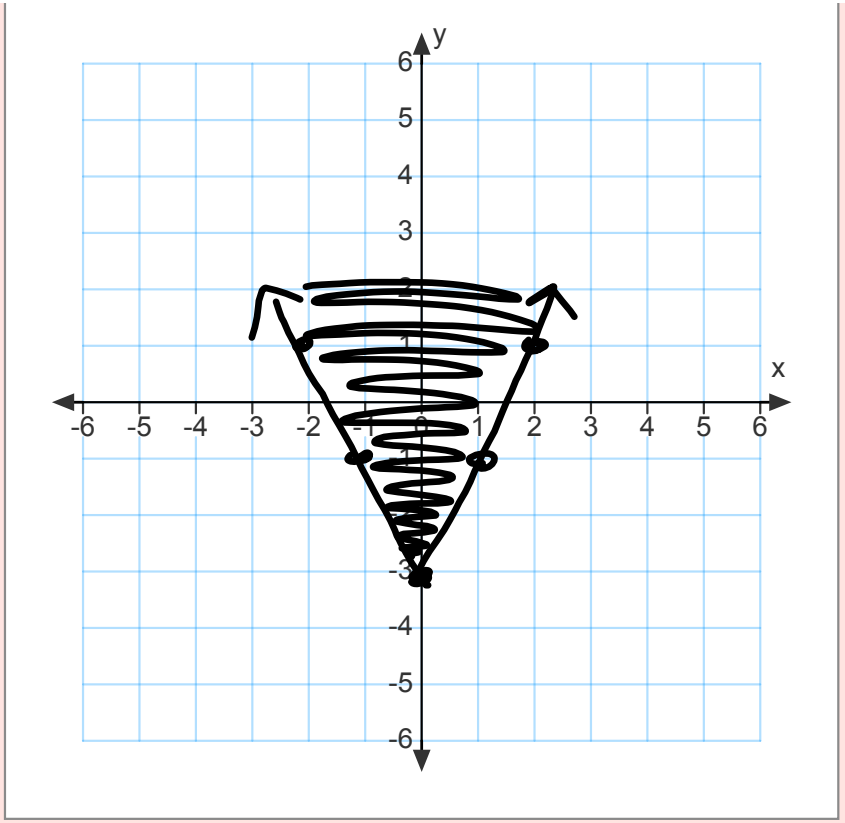
Graph each inequality.

$2x = 0$

4. $y \geq |2x| - 3$

V (0, -3)

x	y
-2	1
-1	-1
0	-3
1	-1
2	1



Graph each inequality.

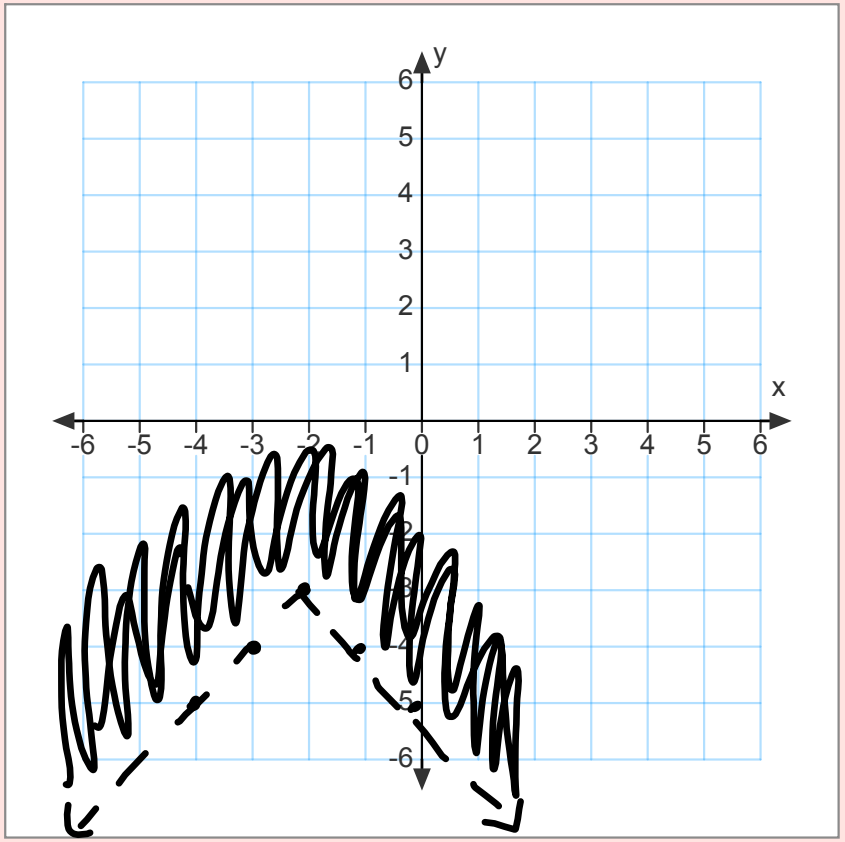
$x+2=0$

5. $y+3 > -|x+2|$

$y > -1|x+2| - 3$

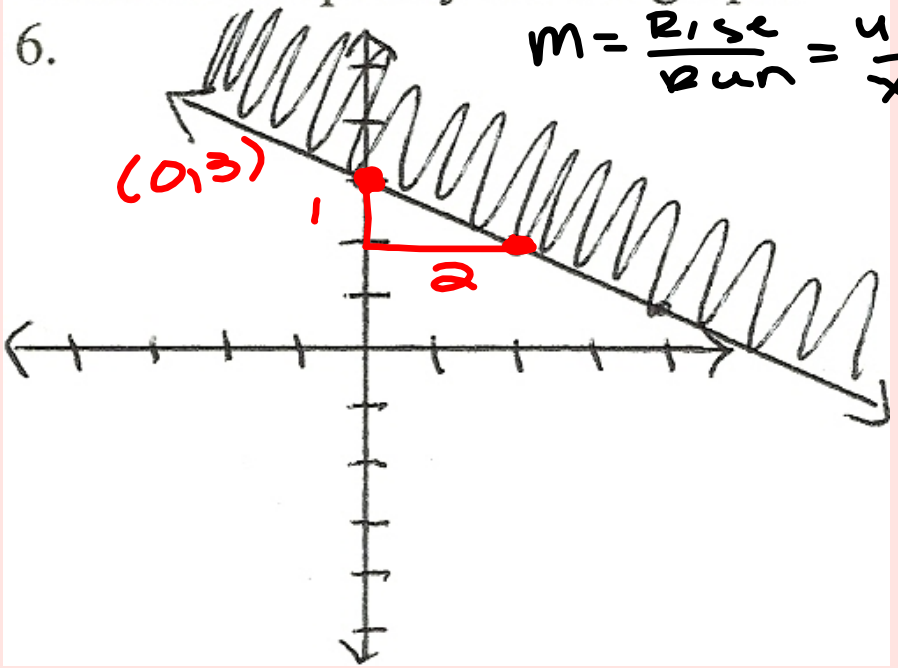
$V(-2,-3)$

x	y
-4	-5
-3	-4
-2	-3
-1	-4
0	-5



Write an inequality for the graph.

6.



$m = \frac{Rise}{Run} = \frac{y_2 - y_1}{x_2 - x_1}$

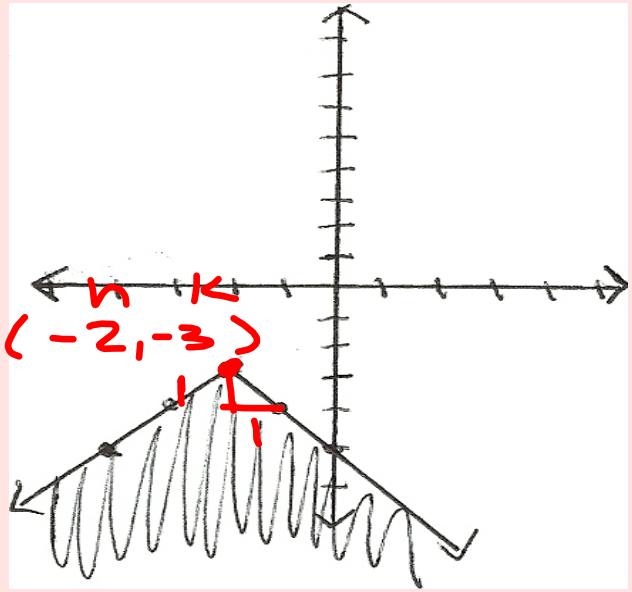
$m = -\frac{1}{2}$ $(0,3)$

$y - y_1 = m(x - x_1)$

$y - 3 \geq -\frac{1}{2}(x - 0)$

$y - 3 \geq -\frac{1}{2}x$

$$y \geq -\frac{1}{2}x + 3$$



Write an inequality for the graph.

$a = -1 \quad h = -2 \quad k = -3$

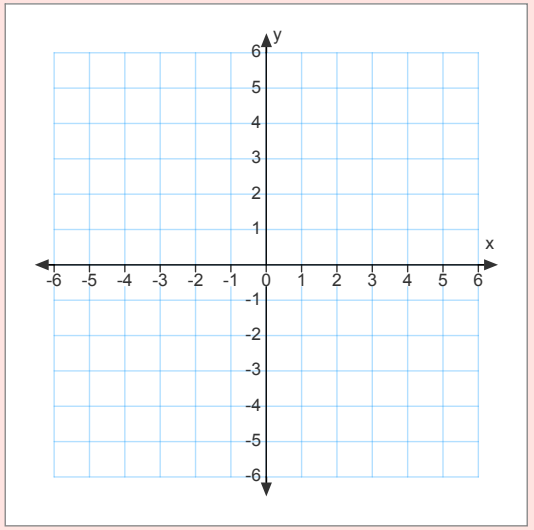
$y = a|x - h| + k$

$y \leq -1|x - (-2)| + -3$

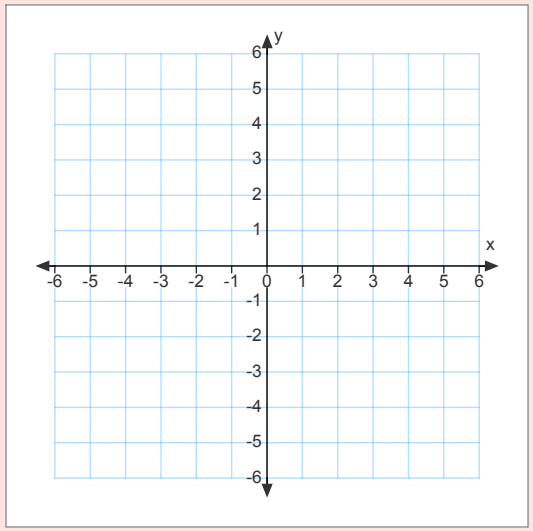
$$y \leq -|x+2| - 3$$

Graph each inequality (extra problems)

8. $4x + 2y \leq 4$

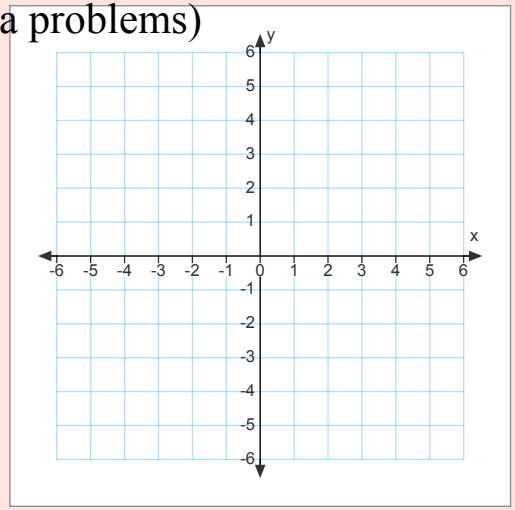


9. $y \geq 3x$

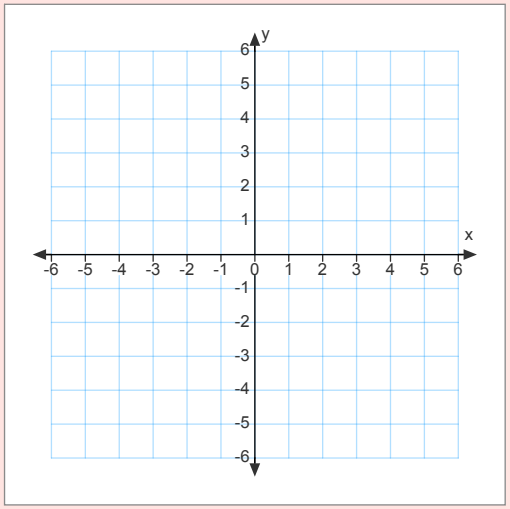


Graph each inequality (extra problems)

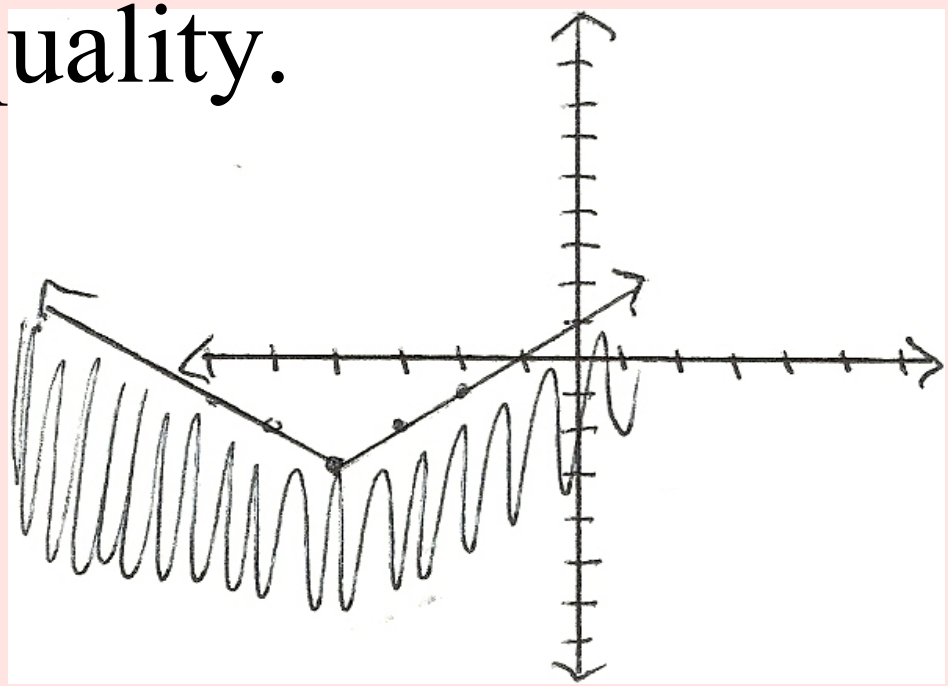
10. $\frac{x}{3} < -y + 2$



11. $2y + 3 \leq -|x - 5|$



12. Write an inequality.



Assignment

Day 1: Pgs 104-105 1-9, 23-29, 36-38