Algebra 1

Lesson 7.6

Solve Systems of Linear Inequalities

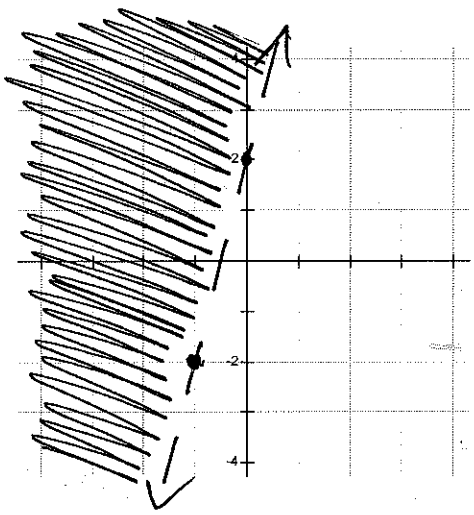
(Day 1)

Warm-Up

Graph each of the following linear inequalities in two variables. Be sure to ~~pick~~ TEST a point and shade!

(a) $y > 4x + 2$

$0 > 2$

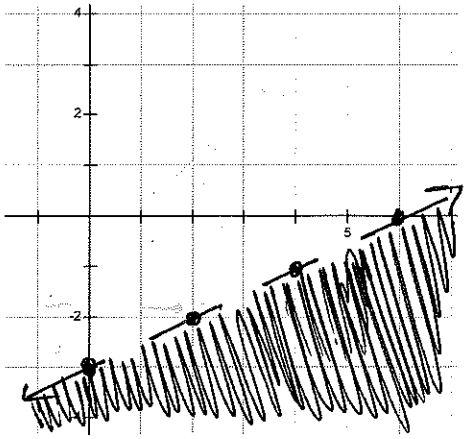


(b) $2x - 4y > 12$

$0 < -3$

$-4y > -2x + 12$

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

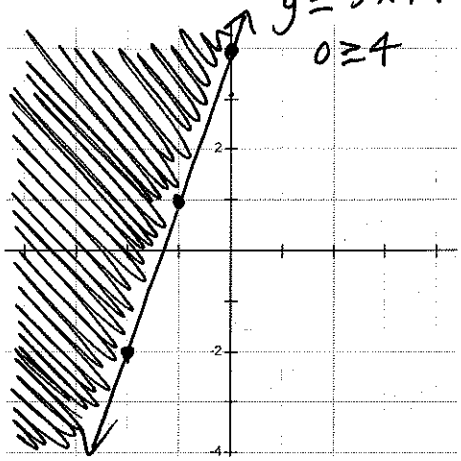


(c) $3x - y \leq -4$

$-y \leq -3x - 4$

$y \geq 3x + 4$

$0 \geq 4$



Example 1. Graph a System of Linear Inequalities

Consider the following system of linear inequalities.

TEST → $y > 3x - 1$ $0 > -1$ TRUE

(0,0) → $y \leq -\frac{2}{5}x + 3$ $0 \leq 3$ TRUE

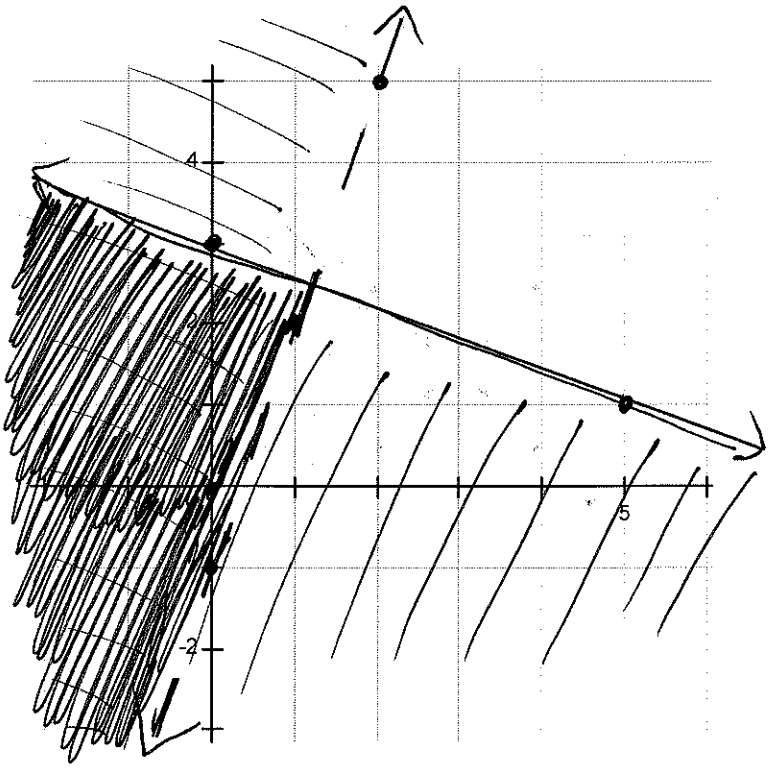
(a) Graph the first line (remember it should be ***dashed***).

(b) ~~Pick~~ TEST a point and shade ***lightly***.

(c) Graph the second line (remember it should be ***solid***).

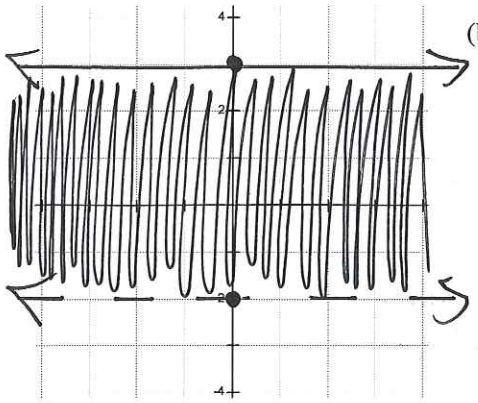
(d) ~~Pick~~ TEST a point and shade ***lightly***.

(e) Shade the area that overlaps.

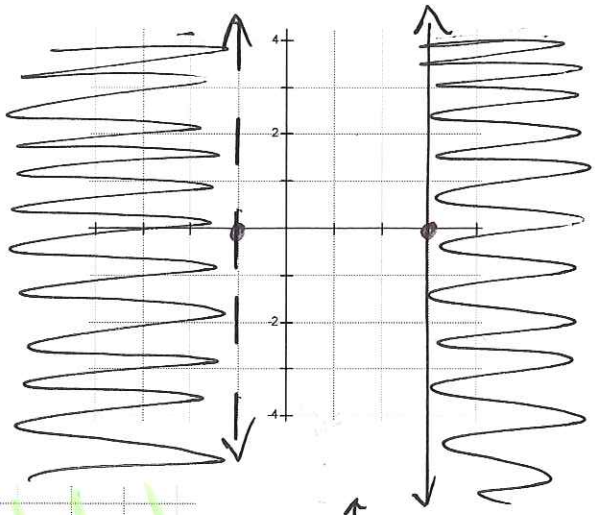


Example 2. Horizontal and Vertical Lines

(a) $y \le 3$
$y > -2$



(b) $x \ge 3$
$x < -1$



* NO SOLUTION *

Because NO INTERSECTION

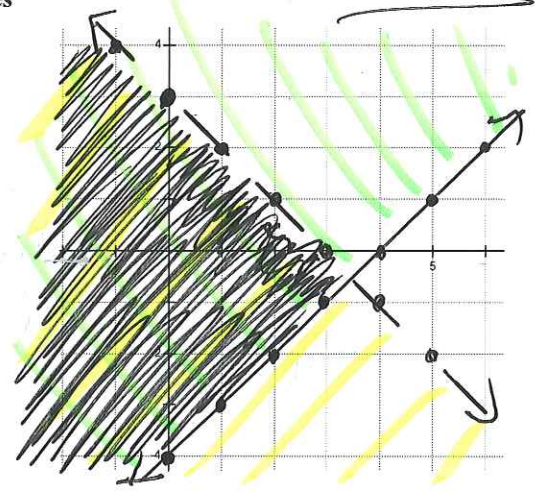
Example 3. Graph a System of Linear Inequalities

$x - y \le 4 \rightarrow x - y \le 4$
$-x \quad -x$
$-y \le -x + 4$
$y \ge x - 4$

TEST (0,0)
$0 \ge -4$
TRUE

$x + y < 3$
$-x \quad -x$
$y < -x + 3$

$0 < 3$
TRUE

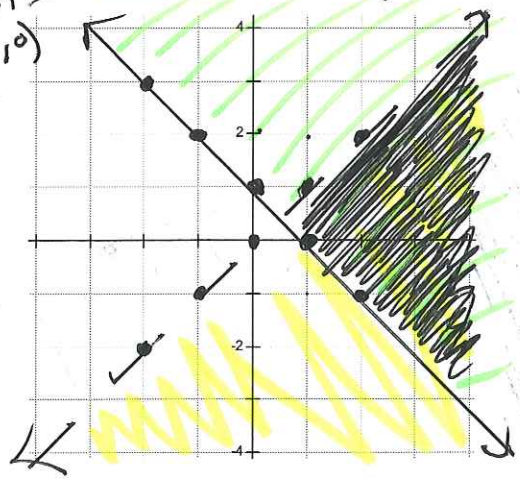


Try It!

(a) $y < x$
$y \ge -x + 1$

TEST (1,2)
$2 < 1$

TEST (0,0)
$0 \ge 1$



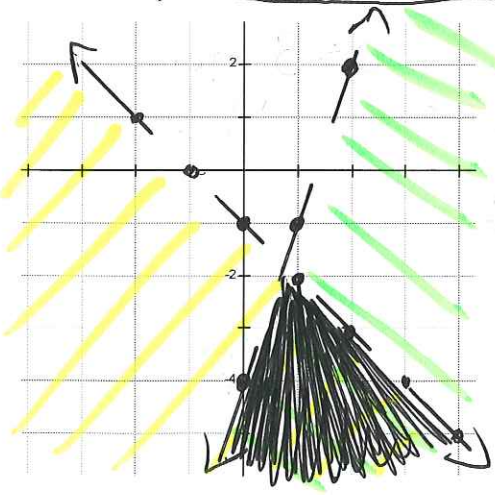
(b) $x + y < -1$
$3x - y > 4$

$y < -x - 1$

TEST (0,0)
$0 < -1$
FALSE

$3x - y > 4$
$-3x \quad -3x$
$-y > -3x + 4$
$y < 3x - 4$

TEST (0,0)
$0 < -4$
FALSE



Assignment

New: Pg. 469 #3 – 8 (all), 10 – 16 (evens)

Review:

Solve.

1. $\frac{3}{5}x - 7 = 17$
2. $4(x - 9) = 8$

Write the equation in slope-intercept form.

3. $-3x + 2y = 6$
4. $2x - 4y + 6 = 0$