

6.7 Notes

“Graphing Linear Inequalities”

Tell whether the ordered pair is a solution of the inequality.

1. $4x - 7y > 28; (-2, 4)$
 $4(-2) - 7(4) > 28$
 $-8 - 28 > 28$
 $-36 > 28$
NO

2. $3/4x - 1/3y < 6; (-8, 12)$
 $3/4(-8) - 1/3(12) < 6$
 $-6 - 4 < 6$
 $-10 < 6$
Yes

GRAPH OF AN INEQUALITY In a coordinate plane, the **graph of an inequality in two variables** is the set of points that represent all solutions of the inequality. The **boundary line** of a linear inequality divides the coordinate plane into two **half-planes**. Only one half-plane contains the points that represent the solutions of the inequality.

KEY CONCEPT *For Your Notebook*

Graphing a Linear Inequality in Two Variables

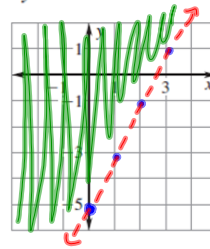
STEP 1 Graph the boundary line. Use a *dashed line* for $<$ or $>$, and use a *solid line* for \leq or \geq .

STEP 2 Test a point not on the boundary line by checking whether the ordered pair is a solution of the inequality.

STEP 3 Shade the half-plane containing the point if the ordered pair is a solution of the inequality. Shade the other half-plane if the ordered pair is *not* a solution.

Graph the Inequality.

3. $2y - 4x > -10$



$2y - 4x > -10$ $y = mx + b$

$+4x \quad +4x$

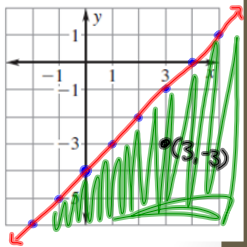
$2y > 4x - 10$

$\frac{2y}{2} > \frac{4x}{2} - \frac{10}{2}$

$y > 2x - 5$ $m = 2 = \frac{4}{2}$
 $b = -5$

$(0, -5)$
 $0 > 2(0) - 5$
 $0 > 0 - 5$
 $0 > -5$

4. $3(x - y) \geq 12$



$3(x - y) \geq 12$

$3x - 3y \geq 12$

$-3x \quad -3x$

$-3y \geq -3x + 12$

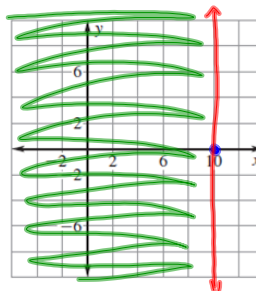
$\frac{-3y}{-3} \geq \frac{-3x}{-3} + \frac{12}{-3}$

$y \leq x - 4$

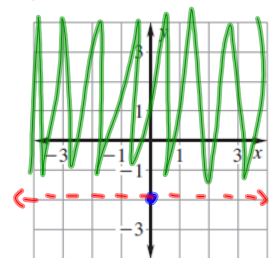
$m = 1$
 $b = -4$

Graph the Inequality.

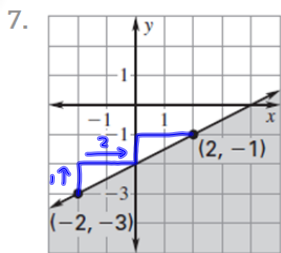
5. $x \leq 10$



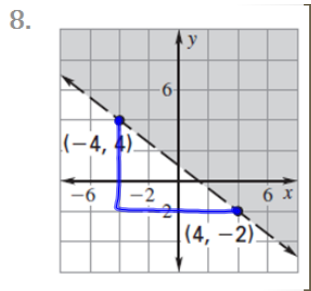
6. $y > -2$



Write an inequality for the graph shown.



$y \leq mx + b$
 $m = \frac{1}{2}$
 $b = -2$
 $y \leq \frac{1}{2}x - 2$

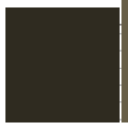


$y < mx + b$
 $m = -\frac{3}{4}$
 $b = 1$
 $y > -\frac{3}{4}x + 1$

Word Problem Practice.

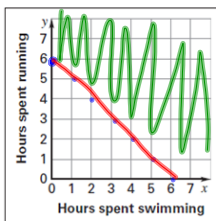
Exercise To keep in shape, you try to swim and run at least 6 hours a week. Let x represent the amount of time you spend swimming in one week and let y represent the amount of time you spend running in one week.

- Write an inequality that describes the number of hours you exercise each week in terms of x and y .
- Graph the inequality.
- Give three possible combinations of hours that allow you to meet your goal.



$x + y \geq 6$
 $-x$ $-x$
 $y \geq -x + 6$

S-6 R-0
 S-0 R-6
 S-3 R-3



HW Tips

*Remember to use either a dashed or solid line.
 Don't forget to shade.*

- Remember to use the correct type of line and shade.
- You cannot buy part of a shirt or half a pair of pants.
THINK LOGICALLY!

- Remember to use the correct type of line and shade.
 Area of a rectangle?
 Area of a triangle?