6.7 Graph Linear Inequalities in Two Variables

Goal • Graph linear inequalities in two variables.

Your Notes

VOCABULARY

Linear inequality in two variables

Graph of an inequality in two variables

Example 1 *Check solutions of a linear inequality*

Tell whether the ordered pair is a solution of $3x - 4y > 9$.

a. (2, 0) **b.** (2, −1)

Solution

a. Test (2, 0):

$3x - 4y > 9$ **Write inequality.**

$3(\_\_\_) - 4(\_\_\_) > 9$ **Substitute ___ for *x* and ___ for *y*.**

$\_\_\_ > 9$ **Simplify.**

(2, 0) _____ a solution.

b. Test (2, −1):

$3x - 4y > 9$ **Write inequality.**

$3(\_\_\_) - 4(\_\_\_\_) > 9$ **Substitute ___ for *x* and _____ for *y*.**

$\_\_\_\_ > 9$ **Simplify.**

(2, −1) _____ a solution.

Your Notes

GRAPHING A LINEAR INEQUALITY IN TWO VARIABLES

Step 1 **Graph** the boundary line. Use a _____ line for < or >, and use a _____ line for ≤ or ≥.

Step 2 **Test** a point not on _____ by checking whether the ordered pair is a solution of the inequality.

Step 3 **Shade** the _____ containing the point if the ordered pair _____ a solution of the inequality. Shade the _____ if the ordered pair _____ a solution.

Example 2 ***Graph a linear inequality in two variables***

Graph the inequality $y < -\frac{1}{2}x + 4$.

Solution

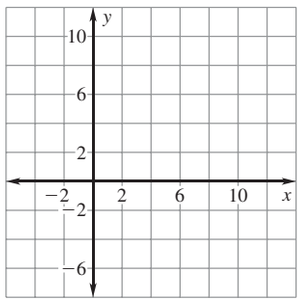
1. Graph the equation $y = -\frac{1}{2}x + 4$. The inequality is <, so use a _____ line.

2. Test (0, 0) in $y < -\frac{1}{2}x + 4$.

$$\_\_\_ < -\frac{1}{2}(\_\_\_) + 4$$

$$\_\_\_ < \_\_\_$$

3. _____ the half-plane that _____ (0, 0) because (0, 0) ____ a solution of the inequality.



Your Notes

Example 3 ***Graph a linear inequality in one variable***

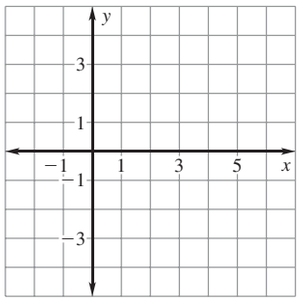
Graph the inequality $x \geq 4$.

Solution

1. **Graph** the equation $x = 4$. The inequality is $\geq$, so use a _____ line.

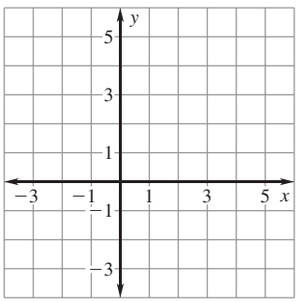
2. **Test** (0, 3) in $x \geq 4$. You only substitute the _____ because the inequality does not have the variable ___.
   ___ ≥ 4

3. _____ the half-plane that _____ (0, 3), because (0, 3) _____ a solution of the inequality.

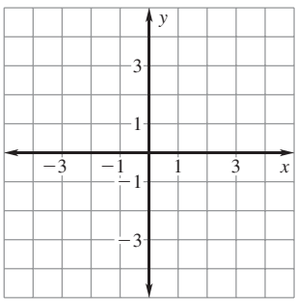


Checkpoint **Graph the inequality.**

1. $2y + 4x > 8$



2. $y < 2$



Homework