

# 2-8 Reteaching

## Two-Variable Inequalities

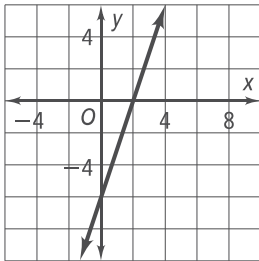
A **linear inequality** in two variables is an inequality whose graph is a region of the coordinate plane bounded by a line. This line is the **boundary**. If the boundary is included in the solution of the inequality, it is drawn as a solid line. If the boundary is not part of the solution of the inequality, it is drawn as a dashed line.

### Problem

What is the graph of  $6x - 2y \leq 12$ ?

$$6x - 2y \leq 12$$

$$y \geq 3x - 6$$



To graph the boundary line, write the inequality in slope-intercept form as if it were an equation.

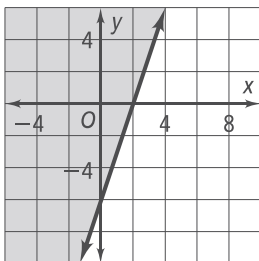
The boundary line is solid if the inequality contains  $\leq$  or  $\geq$ . The boundary line is dashed if the inequality contains  $<$  or  $>$ . Graph the boundary line  $y = 3x - 6$  as a solid line.

$$0 \geq 3(0) - 6$$

Since the boundary line does not contain the origin, substitute the point  $(0, 0)$  into the inequality.

$$0 \geq -6$$

Simplify. The resulting inequality is true.

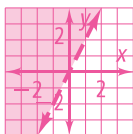


Shade the region that contains the origin. If the resulting inequality were false, then you would shade the region that does not contain the origin.

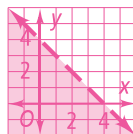
### Exercises

Graph each inequality.

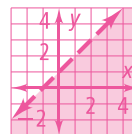
1.  $y > 2x$



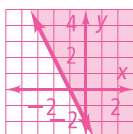
2.  $x + y < 4$



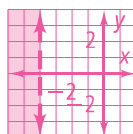
3.  $y < x + 1$



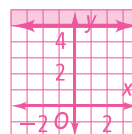
4.  $3x - 2 \leq 5x + y$



5.  $x < -4$



6.  $y \geq 5$



# 2-8 Reteaching (continued)

## Two-Variable Inequalities

To graph two-variable absolute value inequalities, graph the boundary line. Then pick a test point and shade appropriately.

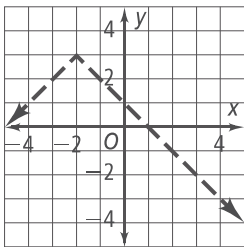
### Problem

What is the graph of  $3 - y < |x + 2|$ ?

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

To graph the boundary line, write the inequality in terms of  $y$  as if it were an equation. The boundary line is dashed because the inequality contains  $>$ .

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



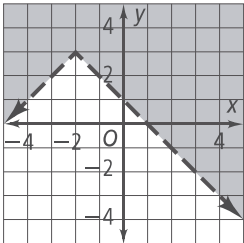
Graph the boundary line  $y = -|x + 2| + 3$ .

$$0 \geq -|0 + 2| + 3$$

Now pick a test point. Because the boundary line does not contain the origin, substitute the point  $(0, 0)$  into the inequality.

$$0 \geq 1$$

Simplify. The resulting inequality is untrue.

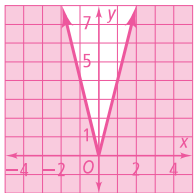


Shade the region that *does not* contain the origin. If the resulting inequality were true, then you would shade the region that *does* contain the origin.

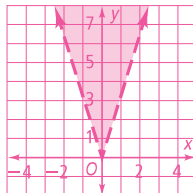
### Exercises

Graph each absolute value inequality.

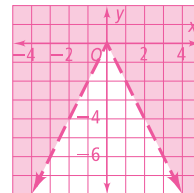
7.  $y \leq |4x|$



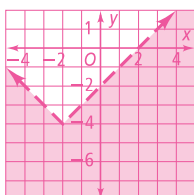
8.  $y > |-3x|$



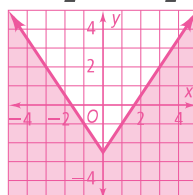
9.  $y \geq -|2x|$



10.  $y < |x + 2| - 4$



11.  $y \leq \frac{3}{2}|x| - \frac{5}{2}$



12.  $-3y > |3x - 6|$

