Name: _____ Date: _____

5.6 Graphing Linear Inequalities in Two Variables

Essential Question: _____

_____

A _____ _____ in two variables, x and y, can be written as

_____ _____ _____ _____

where a, b, and c are real numbers. A _____ of a linear inequality in two variables is an ordered pair (x,y) that makes the inequality _____.

EXAMPLE 1 Checking Solutions

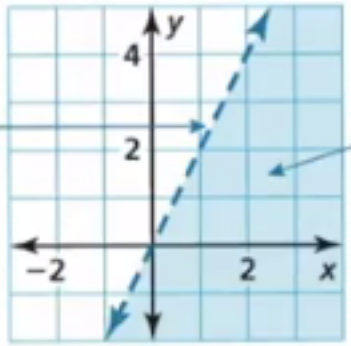
Tell whether the ordered pair is a solution of the inequality.

a. $2x + y < -3; (-1, 9)$ **b.** $x - 3y \geq 8; (2, -2)$

Graphing Linear Inequalities in Two Variables

The graph of a linear inequality in two variables shows _____ the _____of the inequality in a coordinate plane.

All solutions of $y < 2x$ lie on one side of the *boundary line* $y = 2x$.



The boundary line divides the coordinate plane into two **half-planes**. The shaded half-plane is the graph of $y < 2x$.

Core Concept

Graphing a Linear Inequality in Two Variables

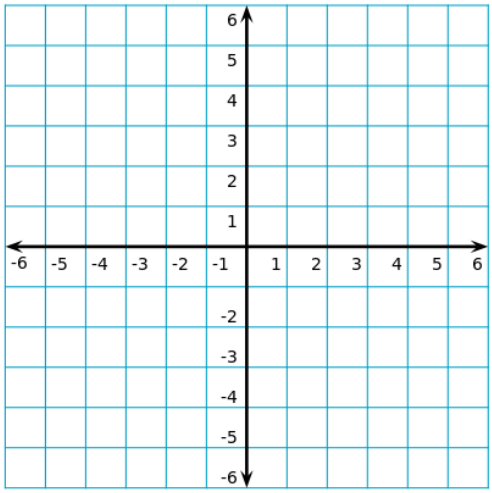
Step 1 Graph the boundary line for the inequality. Use a dashed line for $<$ or $>$. Use a solid line for $\leq$ or $\geq$.

Step 2 Test a point that is not on the boundary line to determine whether it is a solution of the inequality.

Step 3 When the test point is a solution, shade the half-plane that contains the point. When the test point is *not* a solution, shade the half-plane that does *not* contain the point.

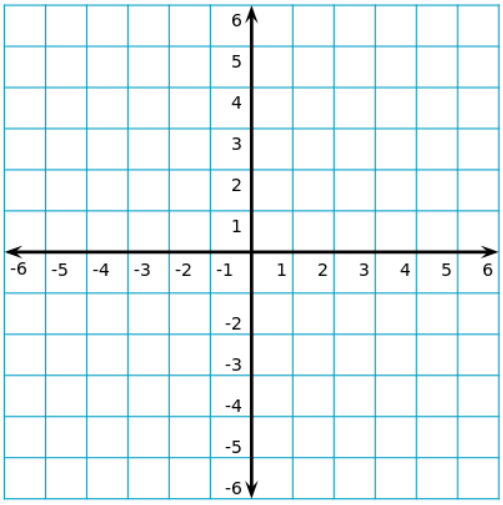
EXAMPLE 2 Graphing a Linear Inequality in One Variable

Graph $y \leq 2$ in a coordinate plane.



EXAMPLE 3 Graphing a Linear Inequality in Two Variables

Graph $-x + 2y > 2$ in a coordinate plane.



Solving Real-Life Problems

EXAMPLE 4 Modeling with Mathematics

You can spend at most \$10 on grapes and apples for a fruit salad. Grapes cost \$2.50 per pound, and apples cost \$1 per pound. Write and graph an inequality that represents the amounts of grapes and apples you can buy. Identify and interpret two solutions of the inequality.