

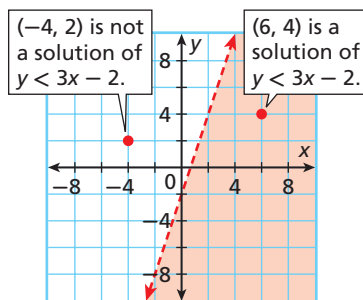
# Section Overview

## Solving Linear Inequalities

Lesson 6-5

**Why?** Linear inequalities are used in consumer economics and geometry. The shaded half-plane contains all possible solutions.

$$y < 3x - 2$$



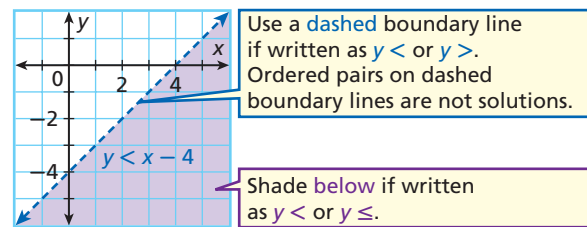
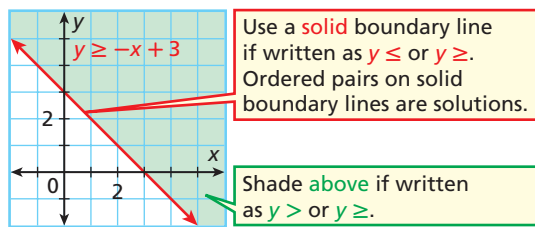
$$\begin{array}{r|l} y < 3x - 2 \\ 4 & 3(6) - 2 \\ 4 & 18 - 2 \\ 4 & 16 \checkmark \end{array}$$

The ordered pair  $(6, 4)$  is a solution.

$$\begin{array}{r|l} y < 3x - 2 \\ 2 & 3(-4) - 2 \\ 2 & -12 - 2 \\ 2 & -14 \times \end{array}$$

The ordered pair  $(-4, 2)$  is not a solution.

To graph an inequality, graph the boundary line and then shade.

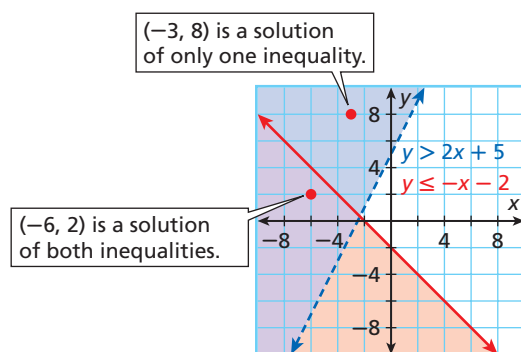


## Solving Systems of Linear Inequalities

Lesson 6-6

**Why?** The graph of a system of linear inequalities can help business owners make decisions that are based on several constraints.

The solutions of  $\begin{cases} y > 2x + 5 \\ y \leq -x - 2 \end{cases}$  must be solutions of  $y > 2x + 5$  and  $y \leq -x - 2$ .



$(-3, 8)$  is not a solution of the system because it is not a solution of both inequalities.

$$\begin{array}{r|l} y > 2x + 5 \\ 8 & 2(-3) + 5 \\ 8 & -6 + 5 \\ 8 & > -1 \checkmark \end{array}$$

$$\begin{array}{r|l} y \leq -x - 2 \\ 8 & -(-3) - 2 \\ 8 & 3 - 2 \\ 8 & \leq 1 \times \end{array}$$

$(-6, 2)$  is a solution of the system because it is a solution of both inequalities.

All solutions lie in the overlapping shaded regions.

$$\begin{array}{r|l} y > 2x + 5 \\ 2 & 2(-6) + 5 \\ 2 & -12 + 5 \\ 2 & > -7 \checkmark \end{array}$$

$$\begin{array}{r|l} y \leq -x - 2 \\ 2 & -(-6) - 2 \\ 2 & 6 - 2 \\ 2 & \leq 4 \checkmark \end{array}$$