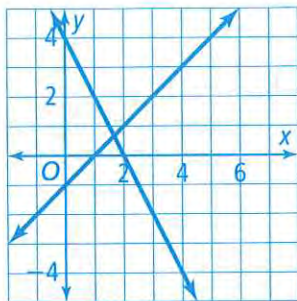


EXPLORE & REASON

The graph shows the equations $y = x - 1$ and $y = -2x + 4$.



- A. Choose some points above and below the line $y = x - 1$. Which of them are solutions to $y > x - 1$? Which are solutions to $y < x - 1$?
- B. Choose some points above and below the line $y = -2x + 4$. Which of them are solutions to $y > -2x + 4$? Which are solutions to $y < -2x + 4$?
- C. **Look for Relationships** The two lines divide the plane into four regions. How can you describe each region in terms of the inequalities in parts A and B? © MP.7

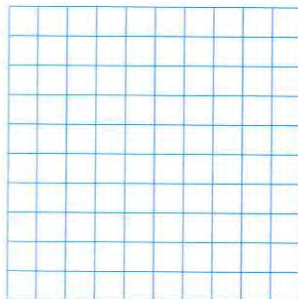
HABITS OF MIND

Reason Are points on the line part of any of the four regions described in Part C? Explain. © MP.2

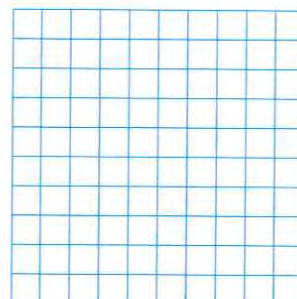
**EXAMPLE 1** **Try It!** Graph a System of Inequalities

1. Graph each system of inequalities.

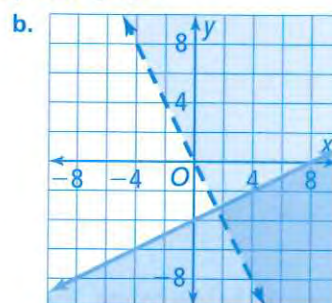
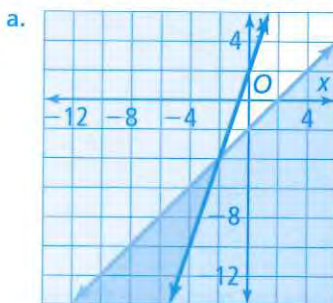
a. $y < 2x$
 $y > -3$



b. $y \geq -2x + 1$
 $y > x + 2$

**EXAMPLE 2** **Try It!** Write a System of Inequalities From a Graph

2. What system of inequalities is shown by each graph?

**HABITS OF MIND****Use Appropriate Tools** What would the graph of a system of inequalities with no solutions look like? © MP.5

**EXAMPLE 3**  **Try It! Use a System of Inequalities**

3. Use the graph in Example 3 to determine if Malia can buy 75 water bottles and 100 pairs of socks. Explain.

HABITS OF MIND

Generalize What do the nonoverlapping portions of the shaded regions represent?  **MP.8**

Do You UNDERSTAND?

1. **ESSENTIAL QUESTION** How is the graph of a system of linear inequalities related to the solutions of the system of inequalities?

2. **Error Analysis** A student says that $(0, 1)$ is a solution to the following system of inequalities.

$$\begin{aligned} y &> x \\ y &> 2x + 1 \end{aligned}$$

She says that $(0, 1)$ is a solution because it is a solution of $y > x$. Explain the error that the student made. © MP.3

3. **Vocabulary** How many inequalities are in a *system of inequalities*?

4. **Use Appropriate Tools** Is it easier to describe the solution of a system of linear inequalities in words or to show it using a graph? Explain. © MP.5

Do You KNOW HOW?

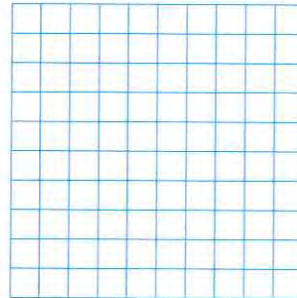
Identify the boundary lines for each system of inequalities.

$$\begin{aligned} 5. \quad y &> -3x + 4 \\ y &\leq 8x + 1 \end{aligned}$$

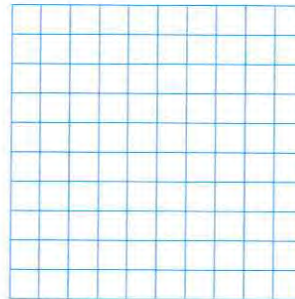
$$\begin{aligned} 6. \quad y &< -6x \\ y &\geq 10x - 3 \end{aligned}$$

Graph each system of inequalities.

$$\begin{aligned} 7. \quad y &\leq -3x \\ y &< 2 \end{aligned}$$



$$\begin{aligned} 8. \quad y &\geq x - 4 \\ y &< -x \end{aligned}$$



9. What system of inequalities is shown by the graph?

