



NAME \_\_\_\_\_

**Module 10** Solving Systems of Linear Equations and Inequalities

**Lesson 4** Solving Systems of Linear Inequalities by Graphing

Is the given point a solution to the system of inequalities? Show all work.

1.  $(0, 7)$   $\begin{cases} x \leq 6 \\ y > -3 \end{cases}$

**Yes**

2.  $(5, 9)$   $\begin{cases} x < -5 \\ 2x \geq 5y \end{cases}$

**No**

3.  $(-1, -1)$   $\begin{cases} x + 3y \leq -3 \\ x + y > 3 \end{cases}$

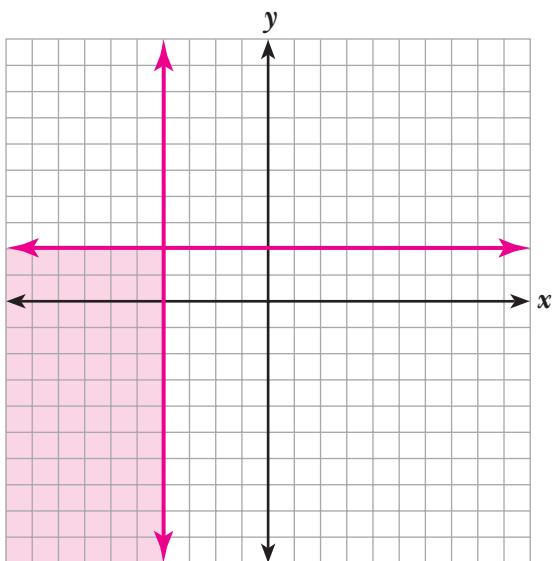
**No**

4.  $(4, -9)$   $\begin{cases} -2x \leq y \\ 3x - 2y \geq 30 \end{cases}$

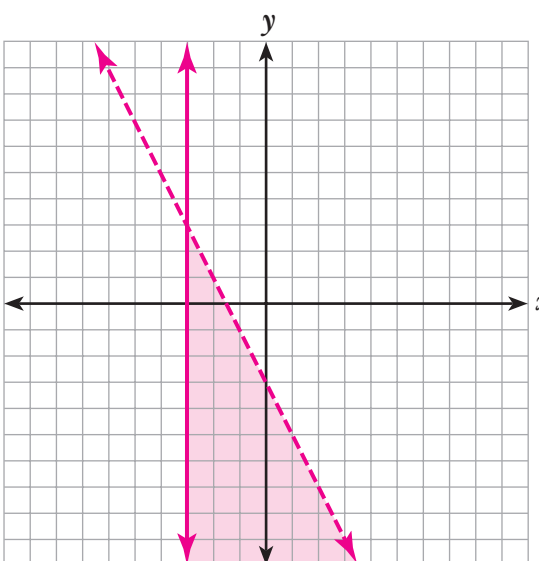
**No**

Graph the solution set for each system of linear inequalities.

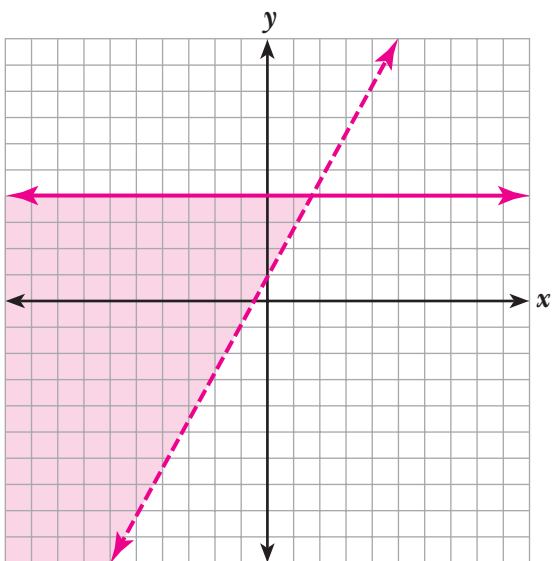
5.  $\begin{cases} y \leq 2 \\ x \leq -4 \end{cases}$



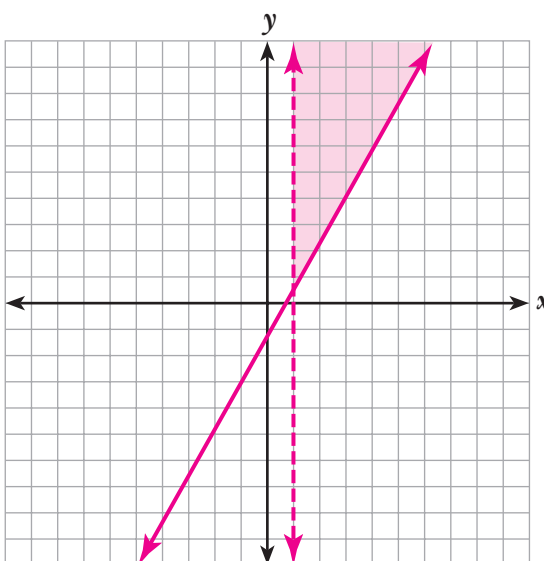
6.  $\begin{cases} x \geq -3 \\ y < -2x - 3 \end{cases}$



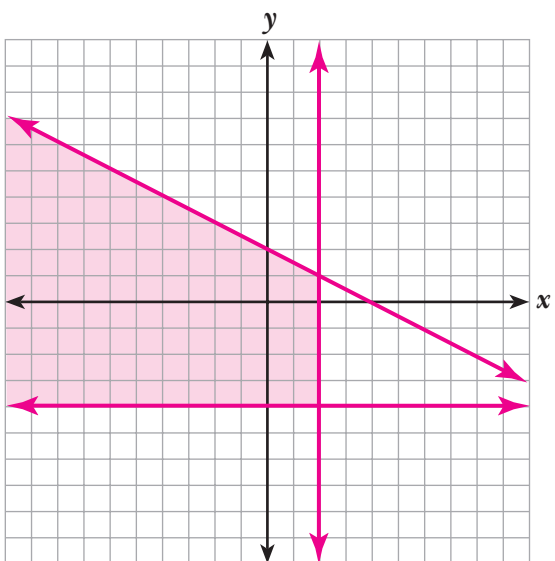
7. 
$$\begin{cases} y \leq 4 \\ y > 2x + 1 \end{cases}$$



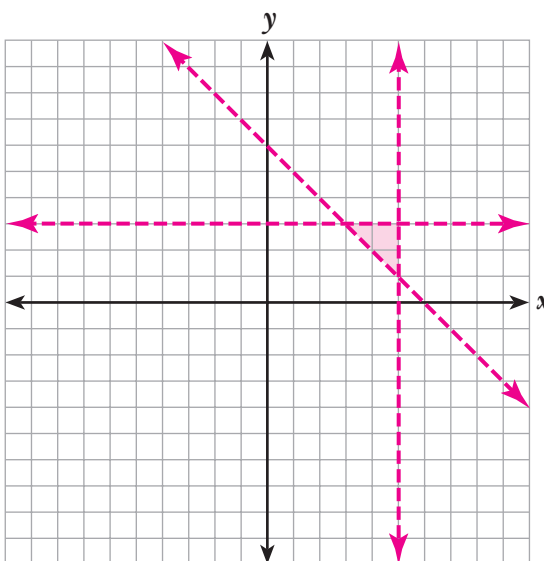
8. 
$$\begin{cases} y \geq 2x - 1 \\ x > 1 \end{cases}$$



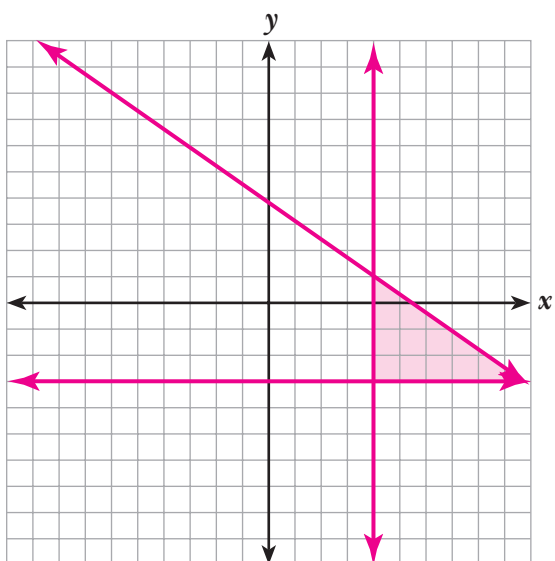
9. 
$$\begin{cases} x \leq 2 \\ y \geq -4 \\ y \leq x + 2 \end{cases}$$



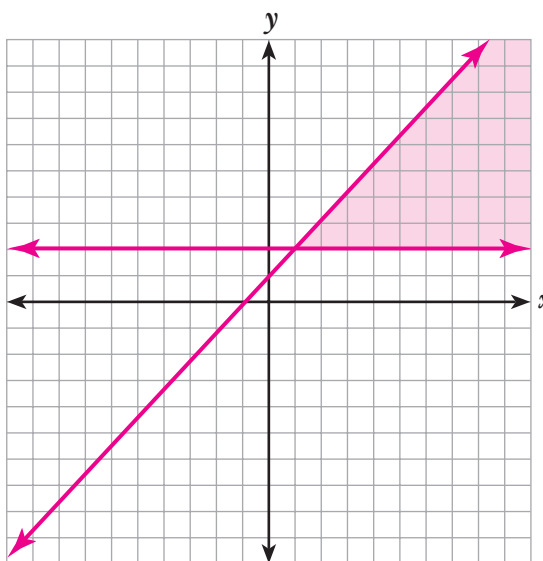
10. 
$$\begin{cases} x < 5 \\ y < 3 \\ x + y > 6 \end{cases}$$



$$11. \begin{cases} y \geq -3 \\ x \geq 4 \\ 3x + 4y \leq 16 \end{cases}$$



$$12. \begin{cases} y \geq 2 \\ y < x + 1 \end{cases}$$



**Solve.**

13. Find the greatest pair of consecutive even integers whose sum is less than 159.

**78 and 80**

14. Madison's last four test grades were 75, 78, 84, and 79. What is the lowest grade she can have on the next test to have an average of at least 80?

**84**

## Journal

1. What ordered pair is usually the easiest to use as a test point? Explain your answer.
2. When would using the origin as a test point NOT be a good idea? How do you select a test point when the origin cannot be used at the test point?
3. What do a solid boundary line and a dashed boundary line indicate about the solution set of a system of inequalities?
4. Describe how to determine the solutions to a system of inequalities by looking at the graph of that system.
5. Why is it important to shade lightly when graphing a system of linear inequalities?

## Cumulative Review

Solve each inequality.

- |   |  |
|---|--|
| 1. $x + 5 \leq 12$ $x \leq 7$ _____                 | 2. $5x - 3 > 17$ $x > 4$ _____                   |
| 3. $7 - m < 11$ $m > -4$ _____                      | 4. $3 - y \leq 2$ $y \geq 1$ _____               |
| 5. $6(x - 1) > 18$ $x > 4$ _____                    | 6. $-2(r - 7) < 15$ $r > -\frac{1}{2}$ _____     |
| 7. $-8 \leq x + 2 \leq 5$ $-10 \leq x \leq 3$ _____ | 8. $-16 < 8n \leq 32$ $-2 < n \leq 4$ _____      |
| 9. $-45 < t - 6 < 90$ $-39 < t < 96$ _____          | 10. $15 \geq 1 - 2d > -17$ $-7 \leq d < 9$ _____ |

### Possible Journal Responses

- The ordered pair (0, 0) is usually the easiest point to use as a test point because most calculations are easier with zeros than with other numbers.
- If a boundary line passes through the origin, then the origin would not be a good point to use as a test point. In this case, choose a point not on a boundary line with coordinates easy to work with.
- A solid boundary line indicates that the ordered pairs whose graphs are on the line are part of the solution set for that inequality. A dashed boundary line indicates that the ordered pairs whose graphs are on the line are not part of the solution set for that inequality.
- Solutions to a system of inequalities are found in the region where the graphs of all the inequalities in the system overlap, or intersect.
- It is important to shade lightly so that the intersection of all shadings is clearly recognizable as the graph of the solution set.