

8-9 Graphing Inequalities (Pages 418–422)

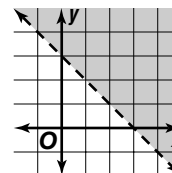
The graph of an inequality consists of a dashed or solid **boundary line** and a shaded region. The boundary line is the graph of the equation that corresponds to the inequality. The boundary is dashed if the inequality symbol is $<$ or $>$ to show that these points are not included in the graph. It is solid for \leq or \geq to show that the boundary points are included in the graph.

Graphing Inequalities	<ul style="list-style-type: none"> To graph an inequality, first draw the graph of the related equality. This boundary line separates the plane into two regions. If the inequality symbol is \leq or \geq, make the boundary line solid; otherwise, it is dashed. To determine which region to shade as the solution, test a point in each region to see if its coordinates make the inequality true.
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EXAMPLE

Graph $y > -x + 3$.

Graph the equation $y = -x + 3$. Draw a dashed line since the boundary is not part of the graph. The origin $(0, 0)$ is not part of the graph, since $0 > -0 + 3$ is false. Thus, the graph is all points in the region above the boundary. Shade this region.



Try These Together

- Which of the ordered pairs is a solution of $x + y \geq 7$?
 a. $(2, 8)$ b. $(-15, 6)$ c. $(0, 7)$

HINT: Replace x and y with the given values to see if they make the inequality true.

- Graph the inequality $y \geq -2x + 4$.

PRACTICE

Determine which of these ordered pairs is a solution of the inequality.

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|--------------------|---------------|--------------|-----------------|
| 3. $3x - 5 \leq y$ | a. $(-2, 4)$ | b. $(1, -1)$ | c. $(2, 6)$ |
| 4. $y \leq x - 7$ | a. $(0, -10)$ | b. $(12, 2)$ | c. $(-12, -11)$ |
| 5. $3x > y - 4$ | a. $(7, 7)$ | b. $(-2, 8)$ | c. $(-1, 0)$ |

Graph each inequality.

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|----------------|--------------------|---------------------|
| 6. $y < x - 7$ | 7. $y \leq 3x - 5$ | 8. $y > 1$ |
| 9. $y + 4 < x$ | 10. $x \geq -4$ | 11. $3x + y \leq 5$ |



- Standardized Test Practice** Which ordered pair is a solution to $2x + y < 5$?

- A $(1, 3)$ B $(3, 1)$ C $(2, 0)$ D $(3, 0)$

Answers: 1. a, c 2. See Answer Key. 3. a, b 4. a, b 5. a, c 6–11. See Answer Key. 12. C