

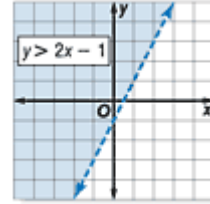
Lesson 8-10

Example 1 Graph Inequalities.

a. Graph $y > 2x - 1$.

Graph $y = 2x - 1$. Draw a dashed line since the boundary is not part of the graph.

Test $(0, 0)$: $y > 2x - 1$
 $0 > 2(0) - 1$ Replace (x, y) with $(0, 0)$.
 $0 > -1$ ✓

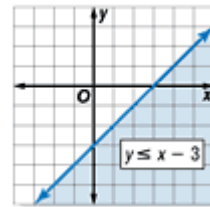


Thus, the graph is all points in the region above the boundary.

b. Graph $y \leq x - 3$

Graph $y = x - 3$. Draw a solid line since the boundary is part of the graph.

Test $(0, 0)$: $y \leq x - 3$
 $0 \leq 0 - 3$ Replace (x, y) with $(0, 0)$
 $0 \leq -3$ not true



$(0, 0)$ is not a solution, so shade the other half plane.

CHECK Test an ordered pair in the other half plane.

Example 2 Write and Graph an Inequality to Solve a Problem

BAKE SALE Susan has \$12 to spend on cookies and muffins at the school bake sale. Each cookie costs \$0.50 and each muffin costs \$1. How many of each can she buy?

Step 1 Write an inequality.

Let x represent the number of cookies and let y represent the number of muffins.

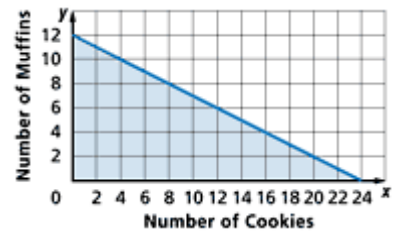
$$\underbrace{\text{Amount spent on cookies}}_{0.50x} \text{ plus } \underbrace{\text{amount spent on muffins}}_{1y} \text{ is at most } \underbrace{\$12}_{12}.$$
$$0.50x + 1y \leq 12$$

Step 2 Graph the inequality.

To graph the inequality, first solve for y .

$$0.50x + y \leq 12 \quad \text{Write the inequality.}$$
$$y \leq -0.50x + 12 \quad \text{Subtract } 0.50x \text{ from each side.}$$

Graph $y \leq -0.50x + 12$ as a solid line since the boundary is part of the graph. The origin is part of the graph since $0 \leq -0 + 12$. Thus, the coordinates of all points in the shaded region are possible solutions.



- (0, 12) = 0 cookies and 12 muffins
- (24, 0) = 24 cookies and 0 muffins
- (12, 6) = 12 cookies and 6 muffins

Note that the solutions are only in the first quadrant because negative numbers of cookies and muffins do not make sense.