Write a system of linear inequalities that defines the shaded region shown.

Solution
Since the shaded region is bounded by two lines, you know that the system must have two linear inequalities.

**INEQUALITY 1** The first inequality is bounded by the line that passes through the points (0, 1) and (3, 4). The slope of this line can be found using the formula for slope.

$m = \frac{y_2 - y_1}{x_2 - x_1}$  
Write formula for slope.

$m = \frac{4 - 1}{3 - 0}$  
Substitute coordinates into formula.

$m = 1$  
Simplify.

Since (0, 1) is the point where the line crosses the y-axis, an equation for this line can be found using the slope-intercept form.

$y = mx + b$  
Write slope-intercept form.

$y = 1x + 1$  
Substitute 1 for $m$ and 1 for $b$.

$y = x + 1$  
Simplify.

Since the shaded region is below this solid boundary line, the inequality is $y \leq x + 1$.

**INEQUALITY 2** The second inequality is bounded by the vertical line that passes through the point (3, 0). An equation of this line is $x = 3$.

Since the shaded region is to the left of this dashed boundary line, the inequality is $x < 3$.

**Answer** The system of inequalities that defines the shaded region is:

$y \leq x + 1$  
Inequality 1

$x < 3$  
Inequality 2

**Checkpoint** Write a System of Linear Inequalities

Write a system of linear inequalities that defines the shaded region shown.

4. 5.