Writing a System of Inequalities from a Graph

Example: Write the system of inequalities given the graph.

LINE 1: Find the slope and y-intercept of line 1.

$m = -\frac{1}{2}$ and $b = 3$

Write the inequality y ❓ $-\frac{1}{2}x + 3$

Pick a point in the overlap to test. I'll pick $(0, 0)$.

0 ❓ $-\frac{1}{2}(0) + 3$

Put in the symbol that will make the statement true.

So, inequality #1 is $y \le -\frac{1}{2}x + 3$

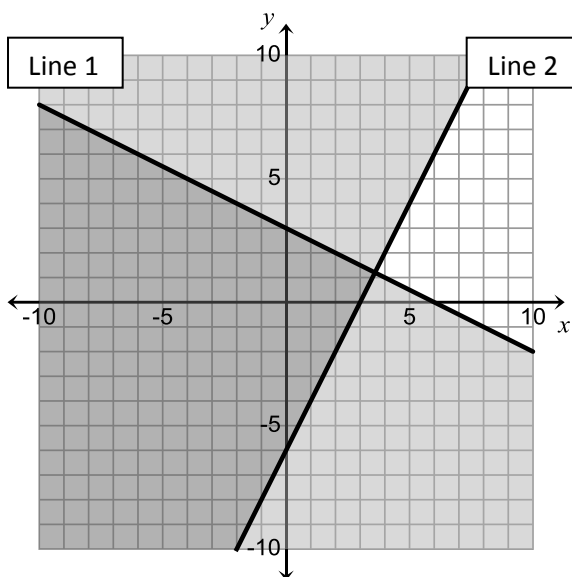**LINE 2:** Find the slope and y-intercept of line 2.

$m = 2$ and $b = -6$

Write the inequality y ❓ $2x - 6$

Pick a point in the overlap to test. I'll pick $(0, 0)$.

0 ❓ $2(0) - 6$

Put in the symbol that will make the statement true.

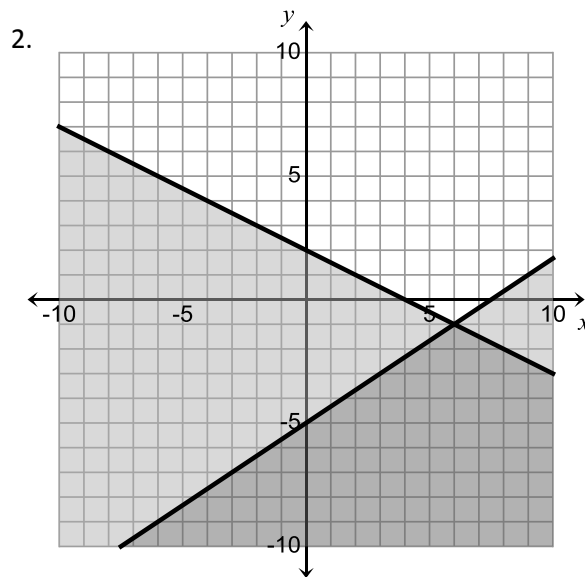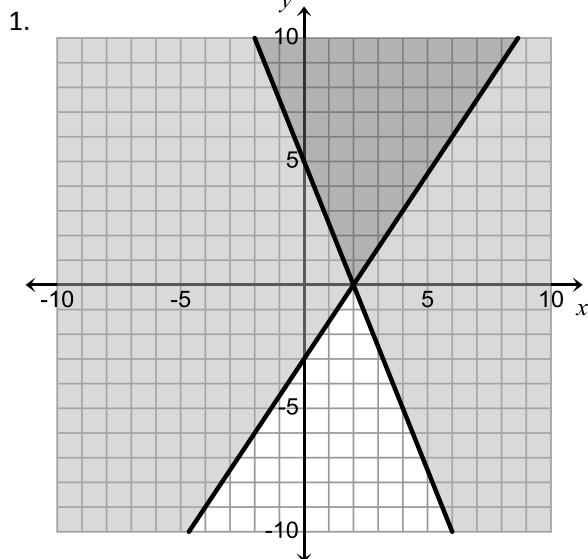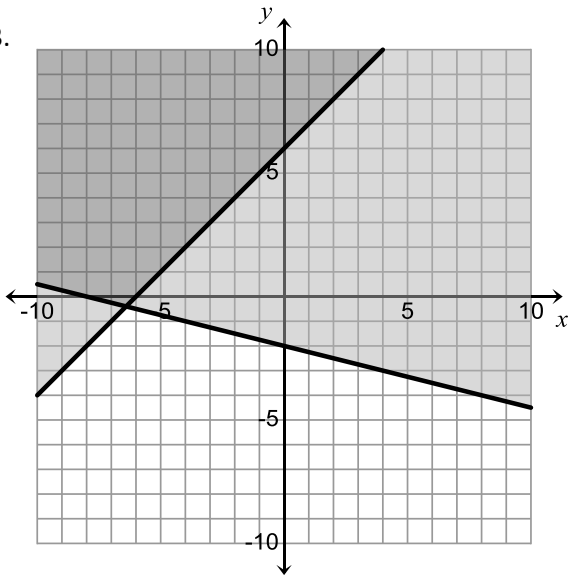So, inequality #2 is $y > 2x - 6$

Line 1   Line 2

Answer: $\begin{cases} y \le -\frac{1}{2}x + 3 \\ y > 2x - 6 \end{cases}$
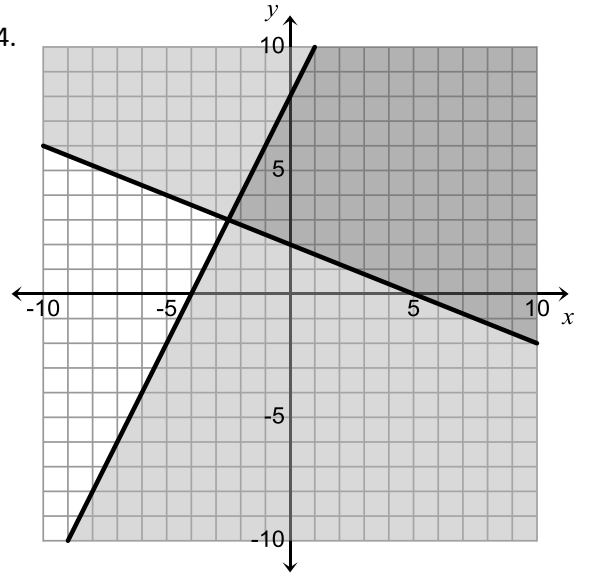
Try These
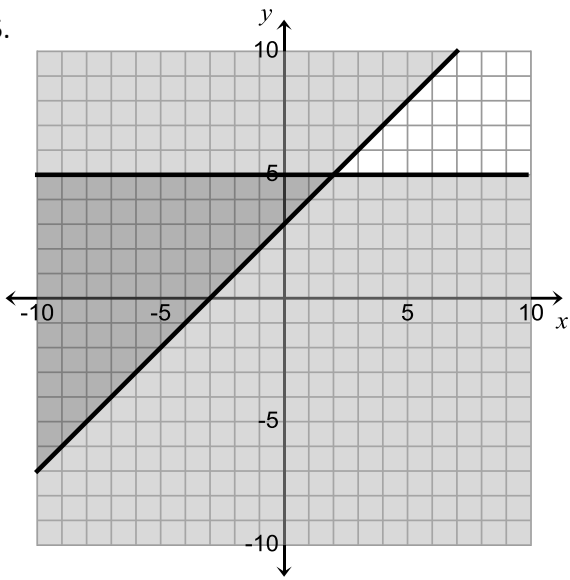
Write the system of inequalities given the graph.

1.

2.

3.

4.

5.

6.