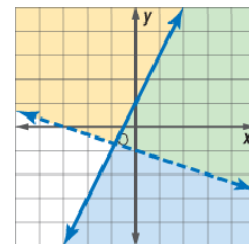


Lesson 8-7

Example 1

Write a system of linear inequalities for the graph shown.



Solution

	Blue	Yellow
Determine m .	$\frac{\text{rise}}{\text{run}} = \frac{2}{1} = 2$	$\frac{\text{rise}}{\text{run}} = \frac{-1}{3} = -\frac{1}{3}$
Determine b .	$b = 1$	$b = -1$
Determine the inequality symbol.	Below \leq Solid	Above $>$ Dashed

The system of linear inequalities for the graph is as follows:

$$y \leq 2x + 1$$

$$y > -\frac{1}{3}x - 1$$

Example 2

Graph the solution set of the system of linear inequalities.

$$3x + y > 2$$

$$2x - y \geq 4$$

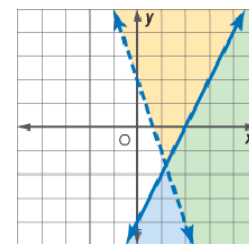
Solution

First write each inequality in slope-intercept form. Then make a chart to use for graphing.

$3x + y > 2$	$2x - y \geq 4$
$3x - 3x + y > 2 - 3x$	$2x - 2x - y \geq 4 - 2x$
$y > -3x + 2$	$-y \geq -2x + 4$
	$y \leq 2x - 4$

Reverse the order of the inequality.

	$y > -3x + 2$	$y \leq 2x - 4$
Boundary	$y = -3x + 2$	$y = 2x - 4$
Shading	Above	Below
Line	Dashed	Solid



The solution set consists of all the points in the doubly shaded region as well as all points on the solid boundary $y = 2x - 4$ that are not below the dashed boundary.

Example 3

BUSINESS Kyle works as a salesperson at an electronics retailer. He receives a bonus if he sells more than 6 televisions in a week or if he sells more than 3 extended service plans.

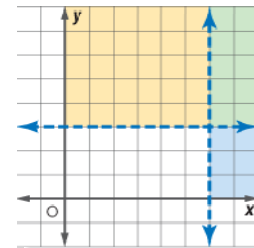
- Write an inequality for selling more than 6 televisions in a week and an inequality for selling more than 3 extended service plans in a week.
- Graph the inequalities and shade the solution.
- Give the coordinates of a point that satisfies the inequalities and the coordinates of a point that does not satisfy the inequalities. Explain the coordinates in terms of sales.

Solution

- Let x = the number of televisions Kyle sells in a week, and let y = the number of extended service plans that he sells in a week.

$$x > 6 \qquad y > 3$$

- Draw a dashed line at $x = 6$, and shade to the right of the line. Draw a dashed line at $y = 3$, and shade above the line.
- The point $(8, 5)$ satisfies both inequalities. This point represents selling 8 televisions and 5 extended service plans.



The point $(5, 2)$ does not satisfy the inequalities. This point represents selling 5 televisions and 2 extended service plans.