

# Systems of Equations and Inequalities

CHAPTER

4

Digital Vision

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# 4.5

## Solving Systems of Linear Inequalities

# Objective

- 1 Graph the solution set of a system of linear inequalities



Graph the solution set of a  
system of linear inequalities



## Graph the solution set of a system of linear inequalities

Two or more inequalities considered together are called a **system of inequalities**. The **solution set of a system of inequalities** is the intersection of the solution sets of the individual inequalities.

To graph the solution set of a system of inequalities, first graph the solution set of each inequality. The solution set of an inequality is a half-plane.

The solution set of the system of inequalities is the region of the plane represented by the intersection of the two shaded half-planes.

# Example 1

Graph the solution set.

**A.**  $y \geq x - 1$

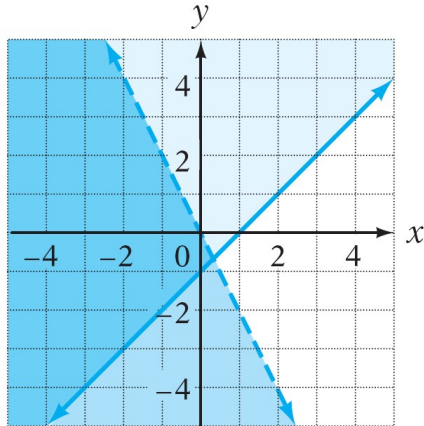
$$y < -2x$$

**B.**  $2x + 3y > 9$

$$y < -\frac{2}{3}x + 1$$

Solution:

**A.**



Shade above the solid line graph of  
 $y = x - 1$ .

Shade below the dashed line graph of  
 $y = -2x$ .

The solution set of the system is the intersection of the solution sets of the individual inequalities.

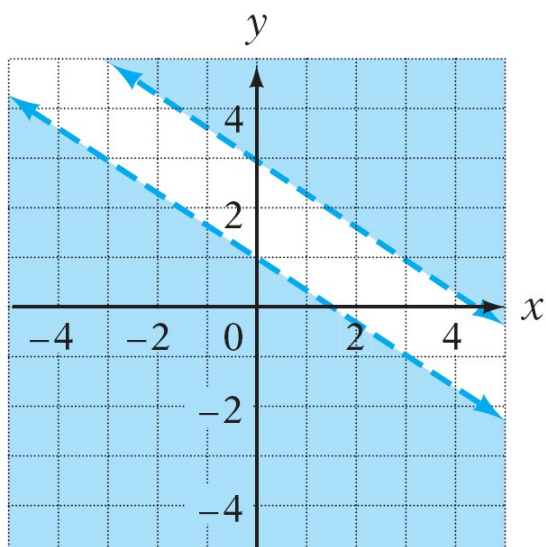
# Example 1 – Solution

cont'd

**B.**  $2x + 3y > 9$

$$3y > -2x + 9$$

$$y > -\frac{2}{3}x + 3$$



Solve  $2x + 3y > 9$  for  $y$ .

Shade above the dashed line graph of  
 $y = -\frac{2}{3}x + 3$ .

Shade below the dashed line graph of  
 $y = -\frac{2}{3}x + 1$ .

The solution set of the system is the empty set because the solution sets of the two inequalities do not intersect.