

LESSON
27

Solving Systems of Linear Inequalities

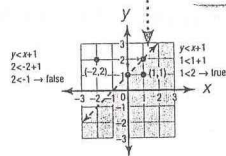
Review It!

To solve a system of linear inequalities, solve each inequality and find the intersection of the solution sets.

Solve the system. $\begin{cases} y < x + 1 \\ y > -x - 1 \end{cases}$

Step 1 Graph the first inequality.

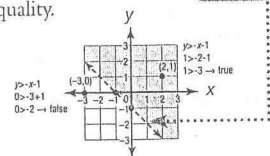
$y < x + 1$
slope = _____
y-intercept = _____



REMEMBER Draw a dashed line for <.

Step 2 On same graph, graph the second inequality.

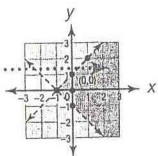
$y > -x - 1$
slope = _____
y-intercept = _____



REMEMBER Draw a dashed line for >.

Step 3 Check by testing a point in the region where the shadings overlap.

REMEMBER Any point in the double-shaded region is a solution.



Test a point: (0, 0)
 $y < x + 1 \dots 0 < 0 + 1 \dots 0 < 1 \dots \text{true}$
 $y > -x - 1 \dots 0 > -0 - 1 \dots 0 > -1 \dots \text{true}$

So, the solution to the system is the region where the two shadings overlap. The solution does not include the dashed lines.

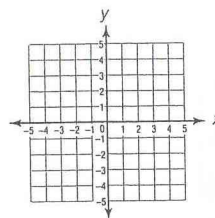
Try It!

Graph each system of linear equalities.



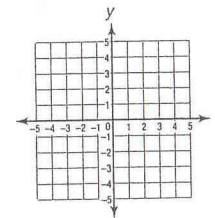
1.

$\begin{cases} y \geq -x + 1 \\ y \leq x + 1 \end{cases}$



2.

$\begin{cases} y < -x + 1 \\ y > x + 1 \end{cases}$

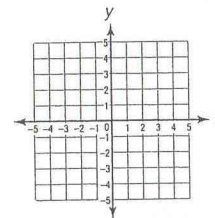


1.

Which is true?
 $0 < -1$, or
 $0 > -1$?

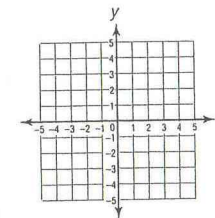
3.

$\begin{cases} y < 2x - 1 \\ y > -2x - 1 \end{cases}$



4.

$\begin{cases} y \leq 2x + 1 \\ y \leq -2x + 1 \end{cases}$



3.

What types of lines did you graph? dashed, or solid

Find whether (0, 0) is part of the solution set of each system of inequalities. Write *yes* or *no*.

5.

the system of inequalities in question 1 _____

6.

the system of inequalities in question 2 _____

7.

the system of inequalities in question 3 _____

8.

the system of inequalities in question 4 _____

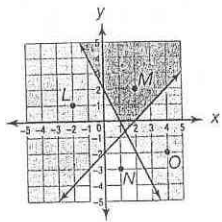
5.

(0, 0) is a solution to which inequality?
 $y \geq -x + 1$, or
 $y \leq x + 1$?

On Your Own!

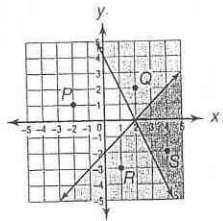
Circle the best answer for each question.

1. Which point is part of the solution set of the system of linear inequalities graphed below?



- A. L C. N
B. M D. O

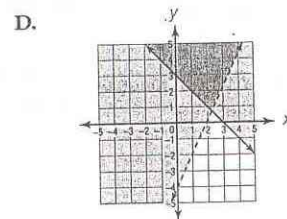
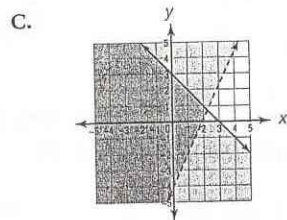
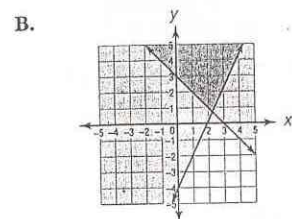
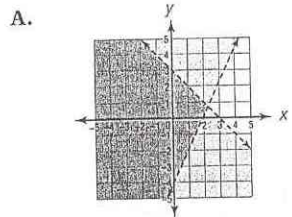
2. Which point is part of the solution set of the system of linear inequalities graphed below?



- A. P C. R
B. Q D. S

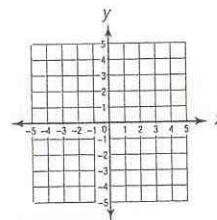
3. Choose the correct graph for the given system of linear inequalities.

$$\begin{cases} y \leq -x + 3 \\ y > 2x - 4 \end{cases}$$



4.
$$\begin{cases} y \leq x + 3 \\ y > x + 1 \end{cases}$$

Part A Graph the system of linear inequalities on the grid below.



Part B Name the coordinates of a point that is a part of the solution set.

Math Words

Fill in the blanks.

5. The graph of an inequality with " $<$ " has a boundary line that is a _____ line.
6. The graph of an inequality with " \leq " has a boundary line that is a _____ line.