Lesson 2.2.1: Systems of Linear Inequalities in Two Variables

- A system of linear inequalities in two variables consists of at least two linear inequalities in the same variables.
- The graph of a system of linear inequalities is the graph of all solutions of the system.
- The solution of a system of linear inequality is the ordered pair that is a solution to all inequalities in the system.

How to Check Whether an Ordered Pair is a Solution to a System of Linear Inequalities?

1. Replace x and y with the given values in both inequalities.
2. Simplify. Check if the ordered pair satisfies both inequalities.

Practice Exercises 2.2.1

A. Write Yes if the given is a system of linear inequalities in two variables or No if it is not.

1. $\begin{cases} y < x+1 \\ x-y \geq 4 \end{cases}$
3. $\begin{cases} x < 4y \\ y \geq 4 \end{cases}$

2. $\begin{cases} 3x \leq y-2 \\ 2x > 3y \end{cases}$
4. $\begin{cases} y < 2x+3 \\ y = 2x+1 \end{cases}$

B. Write Yes if the ordered pair is a solution to the given system of linear inequalities or No if it is not.

1. $(-2,1)$; $\begin{cases} x-y \geq -3 \\ x+y > -2 \end{cases}$
3. $(2,1)$; $\begin{cases} 2x-y \geq 3 \\ x-3y \leq -3 \end{cases}$

2. $(1,-1)$; $\begin{cases} x \leq -y \\ x-2y > 1 \end{cases}$

Activity 2.2.1

A. Write Yes if the given is a system of linear inequalities in two variables or No if it is not.

1. $\begin{cases} y > x-1 \\ x+y \leq 6 \end{cases}$
2. $\begin{cases} x > 3y \\ y \leq 2 \end{cases}$

B. Write Yes if the ordered pair is a solution to the given system of linear inequalities or No if it is not.

1. $(2,1)$; $\begin{cases} x-y \leq 1 \\ x+y < 4 \end{cases}$
3. $(2,-1)$; $\begin{cases} x-2y \leq 4 \\ x+2y \geq 0 \end{cases}$

2. $(-1,1)$; $\begin{cases} x \geq -y \\ 2x+y > 1 \end{cases}$