Section 5.5 Systems of Linear Inequalities

Just as a system of linear equations is made up of two or more linear equations, a **system of linear inequalities** is composed of two or more linear inequalities.

A **solution of a system of linear inequalities** is an ordered pair that satisfies each inequality in the system. The set of all such ordered pairs is the solution set of the system.

# Objective 1: Graphing Systems of Linear Inequalities

The solution set of a system of linear inequalities can best be represented with a graph.

Graph the solution set of the system of linear inequalities.

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| a. $\left\{\begin{array}{c}y\geq 4x\\x+3y>9\end{array}\right.$ Blank coordinate plane that spans from negative ten to positive ten on each axis with a scale of one unit. | b. $\left\{\begin{array}{c}3x-2y<4\\x\leq -1\end{array}\right.$ Blank coordinate plane that spans from negative ten to positive ten on each axis with a scale of one unit. |
| c. $\left\{\begin{array}{c}y\leq 5x-3\\y\leq x+4\end{array}\right.$ Blank coordinate plane that spans from negative ten to positive ten on each axis with a scale of one unit. | d. $\left\{\begin{array}{c}2x-y\leq 7\\x>3\\y\geq 3\end{array}\right.$ Blank coordinate plane that spans from negative ten to positive ten on each axis with a scale of one unit. |

# Objective 2: Modeling with Systems of Linear Inequalities

Franklin High School is planning to take students to a play at a community theater. The theater can hold no more than $240$ people. For every $5$ students, there must be at least one adult.

a. Let $x$ represent the number of students and let $y$ represent the number of adults. Write a system of linear inequalities that models this situation.

b. Graph the solution set of the system of inequalities.