CHAPTER 7: SYSTEMS OF EQUATIONS & INEQUALITIES

Section 6 - Systems of Linear Inequalities

OBJECTIVES

❏ I can solve systems of linear inequalities by graphing

❏ I can write and use systems of linear inequalities to model real situations

VOCABULARY

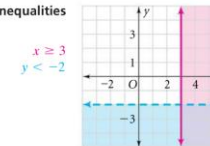| System of Linear Inequalities	Solution to a system of linear inequalities
Two or more linear inequalities on the same coordinate grid	An ordered pair that makes the BOTH inequalities true (there are infinitely many!!)

PART 1: SOLVING SYSTEMS OF LINEAR INEQUALITIES

Two or more linear inequalities together form a **system of linear inequalities.** The system below describes the lavender-shaded region of the graph. Notice that there are two boundary lines.
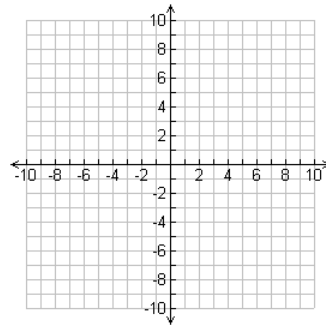
System of Linear Inequalities

$x \geq 3$
$y < -2$

A **solution of a system of linear inequalities** makes each inequality in the system true. The graph of a system shows all of its solutions.

PART 1: SOLVING SYSTEMS OF LINEAR INEQUALITIES

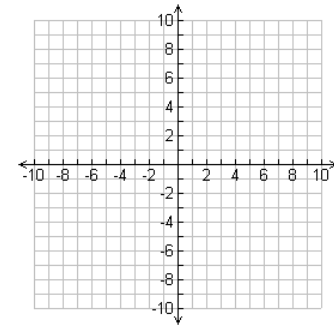Solve the system by graphing. CHECK YOUR SOLUTION!!!

$$\begin{cases} y > -3x - 3 \\ y < -\dfrac{1}{2}x + 2 \end{cases}$$

PART 1: SOLVING SYSTEMS OF LINEAR INEQUALITIES

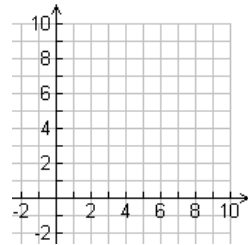Solve the system by graphing. CHECK YOUR SOLUTION!!!

$$\begin{cases} y \le 3x + 1 \\ 4x + 2y > -8 \end{cases}$$

PART 2: REAL SITUATIONS

Suppose you want to fence a rectangular garden plot. You want the length of the garden to be at least 50 ft and the perimeter to be no more than 140 ft. Solve by graphing to show all of the possible dimensions of the garden.

CAN YOU?? PROVE IT!!

❑ I can solve systems of linear inequalities by graphing

❑ I can write and use systems of linear inequalities to model real situations

Mailing Packages Suppose you need $2.40 in postage to mail a package to a friend. You have 9 stamps, some 20¢ and some 34¢. How many of each do you need to mail the package?

a. Give two solutions from the graph in Example 4.
b. Does either solution give you the exact postage needed to mail the package?
c. **Critical Thinking** Why are the solutions to the problem only nonnegative integers?