

# SYSTEM OF LINEAR INEQUALITIES

 Guide Notes

**SYSTEM OF LINEAR INEQUALITIES:** is a set of linear inequalities that you deal with all at once. Usually you start off with two or three linear inequalities.

A system of inequalities can be solved graphically and non-graphically.

## STEPS TO SOLVE SYSTEM OF LINEAR INEQUALITIES

1. Graph each linear inequality as an equality, giving values or finding the intercepts with the axes.
2. If you have closed dots  $\leq, \geq$ , it must be graphed a complete line and if you have open dots  $>, <$ , it must be graphed as a dotted line.
3. After graphing both lines, prove the solution by evaluating a point that belongs to the region you consider is the solution region and if it satisfies the linear inequalities, then that proves that is the solution region.

**Sample Problem 1:** Solve the system of inequalities:

$$\begin{cases} 2x + y \geq 6 \\ x + y \geq 3 \end{cases}$$

**Sample Problem 2:** Solve the following system of inequalities:

$$\begin{cases} x + y > 2 \\ -x + y < 5 \end{cases}$$

**Sample Problem 3:** Word problem of system of linear inequalities:

John is shopping for baseballs and tennis balls at a sport store. Each baseball ball costs \$4 and each tennis ball costs \$2. He needs to buy at least 40 balls in total, and he has \$100 budget. Write a system of inequalities representing the number of balls he could buy.