Algebra II      Test on Chapter 7      Name ________________________________

SHOW ALL WORK on your own paper.  Do NOT write on this paper!

1. REVIEW:  Determine the solution of the following system of **equations:**

$$\begin{cases} 2x + y = 8 \\ 3x + 4y = 7 \end{cases}$$

2. Determine the solution of $x^2 \geq 4x - 3$ and graph the solution on the number line.

3. Graph the inequality $y \leq x^2 - 6x + 5$ on a piece of graph paper.

4-5. Solve each system of inequalities by graphing (on a piece of graph paper):

4. $\begin{cases} 3x + 4y \geq 12 \\ 5x - 3y < 9 \end{cases}$

5. $\begin{cases} |y| < 3 \\ y - 2x < 1 \end{cases}$

6. A Winchester Kazoo maker determined that if she can sell kazoos at (60 - x) dollars where ***x*** is the number of kazoos produced per week, she will be able to sell all of the kazoos that she has made.  How many kazoos could she make so that her revenue is at least $500 per week?

7. The sum of two positive numbers is less than 12, and the difference between the numbers is greater than 8.  Write a system of linear inequalities that models this situation and find three pairs of numbers that are solutions to this system.

8. Determine whether the ordered pair (3, 15) is a solution of $y \geq 2x^2 - 3x + 6$.

9. Determine whether the ordered pair (2, -5) is a solution of the following system of linear inequalities: $\begin{cases} x - 2y \le 7 \\ 3x + 2y > 2 \end{cases}$

10. Determine the maximum of the following objective function under the given constraints. Identify the point in the feasible region at which the maximum occurs.
    Objective Function: P = 3x + 2y
    Constraints: $y + 2x \le 4,\ \ y + x \le 3,\ \ y \ge 0,\ \ x \ge 0$

11. For home football games, the Junior Stand sells hamburgers and hot dogs. At each game, they sell at least half as many hamburgers as hot dogs (in other words, the number of hamburgers sold is at least half as many hot dogs sold). They always sell at least 100 hot dogs. There is space to refrigerate only 150 hamburgers for each game. The Junior Stand makes a profit of $0.90 on each hamburger sold and $0.45 on each hot dog sold. Write the constraints and the objective function for profit. Then identify the vertices of the feasible region and determine the maximum profit.