Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Advanced Functions and Modeling Unit 3 Homework 1**

**Find the maximum and minimum values of each function defined for the polygonal convex set having vertices (0, 0), (4, 0), (3, 5), and (0, 5).**

1. $f\left(x,y\right)=x+y$ 2. $f\left(x,y\right)=8x+y$ 3. . $f\left(x,y\right)=4y-3x$

**Solve each system of inequalities by graphing and name the coordinates of the vertices of each polygonal convex set. Then find the maximum and minimum values for each function on that given set.**

4. 5. $x\leq 3$

 $y\leq 5$

 $x+y\geq 1$

 $x\geq 0$

 $y\geq 0$

 $f\left(x,y\right)=2x+8y+10$



6. $x+4y\leq 12$ 7.

$$ 3x-2y\geq -6$$

 $x+y\geq 5$

 $f\left(x,y\right)=x-y+2$



8. The Plexus Dance Theatre Company will appear at the University of Georgia. According to school policy, no more than 2000 general admission tickets can be sold and no more than 4000 student tickets can be sold. It costs $0.50 per ticket to advertise the dance company to the students and $1 per ticket to advertise to the general public. The dance company has an advertising budget of $3000 for this show. Find the maximum profit the company can make if it charges $4 for a student ticket and $7 for a general admission ticket. How many student tickets should they sell?

I. Define Variables. II. Write profit equation.

III. Define constraints. IV. Graph (on a separate sheet of paper).

V. Identify corner points and find profit at each vertex.

VI. Answer question.