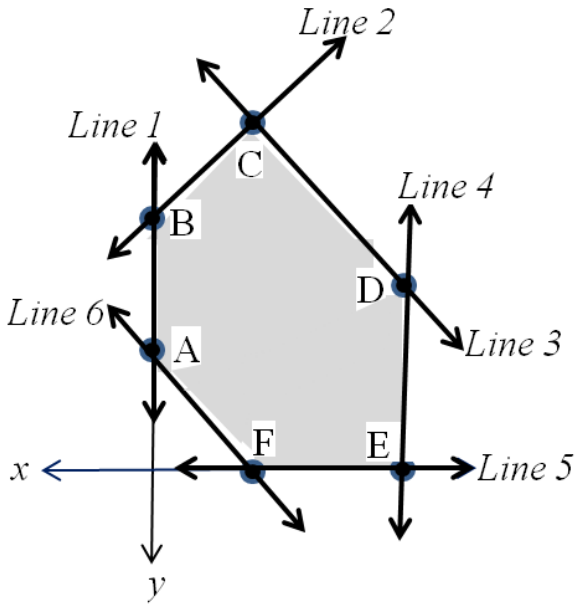
MATH 90 4.5B EXTRA CREDIT WORKSHEET

Name: _____ Score: ___ / 3

Time your class starts: _____Teacher: _____

Instructions: The shaded region in the graph below represents a shape bounded by six lines. Your goals in this exercise are to figure out the coordinates of each vertex of the bounded region, then to calculate the value of an "objective function" of x and y at each vertex point, and finally to identify the vertex that produces the minimum value of that objective function. (If you go on to take Math 123, you will use these skills in solving problems using a process called "linear programming".)

1. Use the diagram and the table of equations of the six boundary lines to calculate the coordinates of the six points A through F. Each of these points is called a **vertex** of the shaded shape. Each vertex is the point of intersection of two of the six boundary lines. The coordinates of each vertex will be the solution of that system of two linear equations. Use the diagram to figure out which two lines intersect to form each vertex, and enter the equations of each pair of lines in the table on the ***back*** of this worksheet. Then show all of the steps in solving each system and write the coordinates of the solution point.
2. Copy your answers for the coordinates of each vertex into the table at the bottom of the back page. Calculate the value of the objective function F for each combination of x and y, showing the steps of your calculations and writing the final answers in the spaces provided.
3. Identify which vertex coordinates produce the minimum value of the objective function F by marking an "**x**" in the appropriate box.



Line	Equation
1	x = 0
2	20y – 25x = 1000
3	50x + 80y = 7000
4	x = 100
5	y = 0
6	40y + 20x = 800

Vertex	This point is the intersection of which two lines? #	Equation	Solve each system of two linear equations. Show all work in the space below, and write the coordinates of the intersection point in the solution box at the far right. **Then copy the coordinates to the table on the bottom.**	Solution (x,y)
A				
B				
C				
D				
E				
F				

Vertex	(x,y)	Work shown for Objective Function **F = 540 – 2x - y**	Result of calculation	Mark minimum function value with an **X**
A				
B				
C				
D				
E				
F				