

Place your name on the back of this sheet of paper and nowhere else. Staple your answers face up on the front of this sheet of paper. Failure to follow these directions will cost you 1 point. If you use double-sided printing or print on the back of scrap paper, I will give you one additional point.

Show all work on all questions.

- 1) (20 points) Use the graphing method to estimate the solution to the following system of equations. $P_s = Q_s + 2$. $P_D = 76 - 3Q_D$. Briefly explain how you found the answer.
- 2) (10 points) Suppose the marginal benefit equation is given by $MB(X) = 20 - X$ and the marginal cost equation is given by $MC(X) = 3X$. Find the utility maximizing quantity of xylophones which should be bought.
- 3) (10 points) Solve the following system of equations using the elimination method.
 $2X + 5Y = 70$, $4X + Y = 50$
- 4) (10 points) Solve the following system of equations using the substitution method.
 $3X + 4Y = 36$, $2X + 3Y = 25$.
- 5) (15 points) Solve the following system of equations. $4X + 3Y + Z = 13$. $2X + 2Y + 2Z = 12$.
 $2X - 3Y + Z = -1$.
- 6) (15 points) Solve the following system of equations. $4X + 5Y = 78$, $3X - 2Y = 1$.
- 7) (20 points) Solve the system of equations $3X + 2Y = 12$ and $Y = 9 - (3/2)X$. If it cannot be solved, draw the diagram which explains why it cannot be solved.