Wilf Csaplar Jr. Business 205 Homework #8 **Due Monday 4/22**

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.

1A) (5 points) Suppose $1.00 worth of the energy industry's output (E) uses $0.20 worth of energy and $0.10 worth of food (F). $1.00 worth of food production uses $0.30 worth of energy and $0.10 worth of food. $1.00 worth of housing (H) uses $0.40 worth of energy and $0.10 worth of housing. Find the Leontief Input-output Matrix and then find I-A. Briefly explain how you found it.
1B) (25 points) Find $(I-A)^{-1}$ using Cramer's Rule.
1C) (5 points) If you wanted to sell $500 worth of energy, $1000 worth of food, and $200 worth of housing, then how much of each do you need to produce?
1D) (5 points) Suppose each $1 worth of energy uses 2 units of capital and 3 units of labor. Suppose each $1 food of energy uses 1 unit of capital and 4 units of labor. Suppose each $1 worth of housing uses 3 units of capital and 1 unit of labor. How much of each input do we need for your answer to Part C?

2A) (5 points) Suppose $1.00 worth of the energy industry's output (E) uses $0.10 worth of energy and $0.20 worth of food (F). $1.00 worth of food production uses $0.20 worth of energy and $0.30 worth of food. $1.00 worth of housing (H) uses $0.30 worth of energy and $0.10 worth of housing. Find the Leontief Input-output Matrix and then find I-A. Briefly explain how you found it.
2B) (25 points) Find $(I-A)^{-1}$ using Cramer's Rule.
2C) (5 points) If you wanted to sell $100 worth of energy, $800 worth of food, and $200 worth of housing, then how much of each do you need to produce?
2D) (5 points) Suppose each $1 worth of energy uses 1 unit of capital and 2 units of labor. Suppose each $1 food of energy uses 3 units of capital and 2 units of labor. Suppose each $1 worth of housing uses 2 units of capital and 4 units of labor. How much of each input do we need for your answer to Part C?

3) (5 points each) Suppose that $F(W, X, Y, Z) = W^2X + 3XYZ^3 - 6WY/Z + (X+Y)^3$. Find each derivative
A) F'_W
B) $\partial F/\partial X$
C) F'_3
D) $\partial F/\partial Z$