Wilf Csaplar Jr. ECON/BUSI 205 Homework #8 **Due Wednesday 4/26**

Place your name on the back of this sheet of paper and nowhere else. Staple your answers on the front of this sheet of paper. Failure to follow these directions will cost you 10 points. If you use double-sided printing or write on the back of scrap paper, I will give you one additional point.

Show all work for all questions.

1) (20 points) Suppose that you had a system of equations Q = 20-2P and Q = 3P - 15. Convert these equations into the matrix notation **Ax** = **b**. Find $\mathbf{A}^{-1}$. Pre-multiply both sides of the equation by $\mathbf{A}^{-1}$ to solve for **x**. What are the equilibrium values for the price and quantity?

2) (10 points each) For each of the following, use the generic matrix **A** to prove the following.
A) If **B** is A with a row swapped then |**A**| =|**B**|
B) If the two columns are the same, then find |**A**|. If two rows are the same then find |**A**|.

$$A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$$

3) (10 points each) Find the inverse for each of the matrices.

$$A = \begin{bmatrix} 2 & 3 \\ -2 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & -1 \\ -2 & -3 \end{bmatrix}$$

4) (40 points) Find the minor matrix **M** and the cofactor matrix **C**. Use that to calculate |**A**| using the cofactor expansion. $A = \begin{bmatrix} 2 & 0 & 1 \\ 0 & 3 & -1 \\ -2 & -3 & 0 \end{bmatrix}$