Revision for midterm 1

1. **Cost Minimization**

   The technology of the firm can be represented by the function:

$$F(X_1, X_2) = lnX_1 + lnX_2$$

Prices of X_1, X_2 are W_1, W_2 respectively. Assume an interior solution.

   a. Set up the minimization problem
   b. Find the TRS and interpret
   c. Find the firm conditional factor demand functions
   d. Calculate the cost function $C(W_1, W_2, Y)$

2. **Profit Maximization**

   A firm has the following production function:

$$F(X_1, X_2) = (X_1^a + X_2^a)$$

Prices of X_1, X_2 are W1, W2 respectively. Assume an interior solution.

   a. Write the maximization problem for the firm
   b. Solve for the factor demand
   c. Find the supply function for the firm $Y(W_1, W_2, Y)$
   d. Find the profit function for the firm $TT(W_1, W_2, Y)$

3. **Kuhn-Tucker conditions**

Consider the following minimization problem with inequality constraint. Solve using the Kuhn-tucker conditions.

Minimize :

$$C = (X_1 - 4)^2 + (X_2 - 4)^2$$

Subject to:

$$2X_1 + 3X_2 \geq 6$$
$$-3X_1 - 2X_2 \geq -12$$
$$X_1, X_2 \geq 0$$

4. **From additional questions-ch8**

Obtaining a simple Slutsky matrix.

For the demand function defined by the two component functions ($L = 2$),

$$\widehat{x}_1(p_1, p_2, w) = [(w + 5p_1)/(3p_1)] - 5 \text{ and } \widehat{x}_2(p_1, p_2, w) = 2(w + 5p_1)/(3p_2),$$

provide the complete Slutsky matrix. Show your work and simplify the elements.

5. **From additional questions-ch7**

Consider the utility function $z = \ln(Ax_1^{a} x_2^{1-a})$, solve for the Marshallian demand functions.

6. **Consider $C(w,y) = AW_1^{a} W_2^{B} y$. Find the conditional input demands.**