AREC 310 - Homework 3

30 points possible

Directions: Answer the following questions completely. You can work with your peers, but you MUST TURN IN YOUR OWN ANSWERS (i.e., in your own words) to get credit. Upload a PDF to Canvas by the due date.

Problem 1: Demand (5 points)

You are given the following demand schedule for white, whole grain processed flour. Use it to answer the following questions.

Price (U.S. dollars per lb)	Quantity (1000 lbs)
15	10
16	8
17	6
18	4
19	2
20	0

a. Plot the demand curve using appropriate economic conventions.

b. What is the slope? Is it positive or negative? Why?

c. Calculate the own-price elasticity of demand when the price changes from \$18/lb to \$15/lb. Is it elastic or inelastic? Interpret.

d. ConAgra (the owner of Ultragrain, a version of processed whole wheat flour) recently began an advertising campaign highlighting the health benefits of increasing whole grains in a diet. Will this affect the demand schedule given above? If so, how? Clearly illustrate on your graph from (a). If not, explain why.

e. Researchers at CSU recently developed a new method to clean the haulers that transport the white, whole wheat grain from the farms to the processing plants that decreases the amount of time it takes to clean the haulers. Will this affect the demand schedule given above? If so, how? Clearly illustrate on your graph from (a). If not, explain why.

Problem 2: Supply (5 points)

You are given the following schedule of supply for white, whole grain processed flour. Use it to answer the following questions.

Price (U.S. dollars per lb)	Quantity (1000 lbs)
34	12
30	10
26	8
22	6
18	4
14	2

a. Plot the supply curve using appropriate economic conventions.

b. What is the slope? Is it positive or negative? Why?

c. Calculate the own-price elasticity of supply when the price changes from \$22/lb to \$30/lb. Is it elastic or inelastic? Interpret.

d. ConAgra recently began an advertising campaign highlighting the health benefits of increasing whole grains in a diet. Will this affect the supply schedule given above? If so, how? Clearly illustrate on your graph from (a). If not, explain why.

e. Researchers at CSU recently developed a new method to clean the haulers that transport the white, whole wheat grain from the farms to the processing plants that decreases the amount of time it takes to clean the haulers. Will this affect the supply schedule given above? If so, how? Clearly illustrate on your graph from (a). If not, explain why.

Problem 3: Equilibrium (9 points)

Given the supply and demand conditions illustrated in Problems 1 and 2, respectively, answer the following questions.

a. What is the equilibrium price and quantity in the white, whole wheat processed flour market under the initial conditions depicted by the demand and supply schedules?

Graph it using the complete schedules.

b. Assume white whole wheat processed flour is a normal good. If food assistance benefits increase, will the equilibrium in the market be different from what you found in part (a)? If so, how? Clearly illustrate on your graph. If not, explain why.

c. Assume that more farmers start to plant white, whole wheat. Assume that the planting and harvesting conditions were average. Will the equilibrium in the market be different from what you found in part (a)? If so, how? Clearly illustrate on your graph. If not, explain why.

Problem 4: Impact of Higher Beef Prices on the Pork Market (11 points)

Suppose you are a pork market analyst, and beef prices are expected to rise dramatically, by 10%.

Because beef and pork are substitutes, this price change creates a demand shock in the pork market. Specifically, you are asked to calculate the resulting changes in the pork price and pork quantity.

Parameters:

- Long-run supply elasticity of pork: $E_S = 2.15$
- Long-run demand elasticity of pork: $E_D = -1.96$
- Cross-price elasticity of pork demand with respect to beef: 0.6

Tasks:

1. Calculate the value of the demand shock, S_D.

Hint: $S_D = (\textit{cross-price elasticity of pork demand w.r.t. beef})(\%\Delta P_{beef})$

2. Write the supply and demand equations in elasticity form.
3. Solve for the equilibrium percent change in pork price, $\%\Delta P$.
4. Solve for the equilibrium percent change in pork quantity, $\%\Delta Q$.
5. Briefly explain the intuition behind your results.