

1. Soja Farm is a typical profit-maximizing firm that produces and sells soybeans in a constant-cost, perfectly competitive market that is in long-run equilibrium. The market equilibrium price of soybeans is \$14 per bushel.

(a) Draw correctly labeled side-by-side graphs for the soybean market and for Soja Farm, and show each of the following.

- (i) The market equilibrium price and quantity, labeled \$14 and Q_M , respectively
- (ii) Soja Farm's profit-maximizing price and quantity, labeled P_F and Q_F , respectively
- (iii) Soja Farm's average total cost curve consistent with a long-run equilibrium, labeled ATC

(b) If Soja Farm is the only firm in the market that chooses to increase its price of soybeans to \$15 per bushel, will Soja Farm's total revenue increase by \$1, remain the same, or decrease to \$0? Explain.

(c) Soybeans are used as an input in the production of tofu. Tofu now becomes a more popular food option among consumers. On your graphs in part (a), show the short-run effect of the increased popularity of tofu on each of the following.

- (i) The new market equilibrium price and quantity of soybeans, labeled P_2 and Q_2 , respectively
- (ii) Soja Farm's new profit-maximizing quantity, labeled Q^*

(d) Given the increase in popularity of tofu in part (c), what will happen to the number of firms in the soybean market in the long run? Explain.

(e) Suppose a 25% increase in the market price of quinoa causes a 5% decrease in the quantity demanded of quinoa and a 10% increase in the quantity demanded for tofu.

- (i) Is the demand for quinoa elastic, inelastic, or unit elastic? Explain using numbers.
- (ii) Calculate the cross-price elasticity of demand between quinoa and tofu. Show your work.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

1. Sugar is produced in a perfectly competitive market using inputs from perfectly competitive factor markets. Frank Sugar Co. is a representative firm in the sugar market.

(a) Assume Frank Sugar Co. is earning zero economic profit. Draw correctly labeled side-by-side graphs for the sugar market and Frank Sugar Co. and show each of the following.

- (i) The market equilibrium price and quantity, labeled P_M and Q_M , respectively
- (ii) The profit-maximizing price and quantity for Frank Sugar Co., labeled P_F and Q_F , respectively

(b) Assume the demand for sugar increases and sugar is produced in a constant-cost industry.

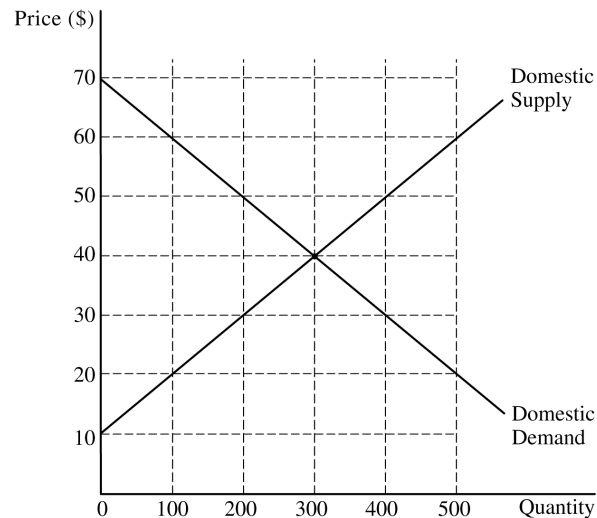
- (i) On your graph in part (a), show the short-run effect of the increased demand for sugar on the market price, labeled P_2 , and the quantity sold by Frank Sugar Co., labeled Q_N .
- (ii) Compared to the equilibrium identified in part (a)(ii), what will happen to the short-run profit earned by Frank Sugar Co. as a result of the increased demand for sugar?
- (iii) When the market adjusts to long-run equilibrium, how will the market price of sugar in the long run compare to P_2 ? Explain.

(c) Instead, assume sugar consumption has a negative impact on public health over time and the negative impact of sugar on health is underestimated by consumers. Draw a correctly labeled graph of the market, with the marginal social benefit (MSB), marginal private benefit (MPB), marginal social cost (MSC), and marginal private cost (MPC) curves, and show each of the following.

- (i) The market equilibrium quantity, labeled Q_M
- (ii) The socially optimal quantity, labeled Q_S

(d) Assume the government decides to intervene in the market to affect consumers' incentives and to address the negative impact of sugar consumption on public health. Which of the following policies would best achieve that objective in the short run: a lump-sum tax, a per-unit tax, a lump-sum subsidy, or a per-unit subsidy? Explain.

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2. The graph provided depicts New Zealand's domestic supply and demand for wool.

- Calculate the consumer surplus if New Zealand does not trade with the rest of the world. Show your work.
- Instead, assume New Zealand decides to trade wool in the world market. The current world price of wool is \$60 per unit, and New Zealand is a price taker in the world market.
 - How many units of wool will New Zealand export?
 - What will happen to the consumer surplus of wool consumers in New Zealand when New Zealand begins to trade with the rest of the world? Explain.
 - Will total economic surplus in New Zealand increase, decrease, or remain unchanged when New Zealand begins to trade wool in the world market? Explain using numbers.
- Now assume domestic demand in New Zealand increases. Will New Zealand's exports increase, decrease, or stay the same?

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

MICROECONOMICS

Section II

Total Time—60 minutes

Reading Period—10 minutes

Writing Period—50 minutes

Directions: You are advised to spend the first 10 minutes reading all of the questions and planning your answers. You will then have 50 minutes to answer all three of the following questions. You may begin writing your responses before the reading period is over. It is suggested that you spend approximately half your time on the first question and divide the remaining time equally between the next two questions. Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. Use a pen with black or dark blue ink.

- Corn is used as food and as an input in the production of ethanol, an alternative fuel. Assume corn is produced in a perfectly competitive market.
 - Draw correctly labeled side-by-side graphs for the corn market and a representative corn farmer. On your graphs show each of the following.
 - The equilibrium price and quantity in the corn market, labeled P_M and Q_M , respectively
 - The profit-maximizing quantity of corn produced by the representative farmer earning zero economic profit, labeled Q_F
 - Assume the demand for ethanol increases. On your graphs in part (a) show what will happen to each of the following in the short run.
 - The market price and quantity of corn, labeled P^* and Q^*
 - The area of the profit or loss earned by the representative corn farmer, shaded completely
 - Relative to your answer in part (b), state what will happen to the market equilibrium price and quantity of corn in the long run. Explain.
 - Soybeans are produced in a perfectly competitive market. Assume farmers can grow either corn or soybeans on the same land. What happens to the price of soybeans in the next planting season if the price of corn increases? Explain.
 - Assume instead that the government sets a binding price ceiling in the corn market. Draw a new correctly labeled graph for the corn market and show each of the following.
 - The binding price ceiling, labeled P_c
 - The quantity purchased by consumers in the corn market, labeled Q_p

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1. The markets for bananas, muffins, and coffee are interrelated, and each market is perfectly competitive.
 - (a) In the market for bananas, the equilibrium price is \$1.00 per pound, and the equilibrium quantity is 1,000 pounds per week. Suppose the government imposes a price floor on bananas at \$1.20 per pound, causing the quantity supplied to increase to 1,500 pounds per week.
 - (i) Would the price floor result in a shortage, a surplus, or neither? Explain.
 - (ii) Calculate the price elasticity of supply if the price increases from \$1 to \$1.20. Show your work.
 - (iii) Between \$1 and \$1.20, is the supply elastic, unit elastic, or inelastic? Explain.
 - (b) Bananas are an input for muffins.
 - (i) Draw a correctly labeled graph of the market for muffins indicating the equilibrium price and quantity, labeled P_0 and Q_0 , respectively.
 - (ii) On the graph drawn in part (b)(i), show the impact of an increase in the price of bananas on the muffin market, labeling the new equilibrium price and quantity P_1 and Q_1 , respectively.
 - (iii) On the same graph, completely shade the area that represents the change in the consumer surplus caused by the increase in the price of bananas.
 - (c) In the market for coffee, the equilibrium price is \$3.00 per cup and the equilibrium quantity is 100 cups per week. The cross-price elasticity of coffee with respect to muffins is -2 .
 - (i) Are coffee and muffins normal goods, inferior goods, complementary goods, or substitute goods?
 - (ii) Assume the supply of coffee is perfectly elastic. Using the equilibrium price and quantity given above, draw a correctly labeled graph for the coffee market, and show the impact of an increase in the price of muffins on the coffee market.
 - (iii) Given the original quantity of 100 cups of coffee per week, if the increase in the price of muffins is 10%, calculate the new equilibrium quantity in the coffee market. Show your work.