

3. In Gorkeland, the domestic market for cucumbers is characterized by a downward-sloping demand curve and an upward-sloping supply curve, and the market for cucumbers is currently in equilibrium at a price of \$20 per bushel.

Part A

Draw a correctly labeled graph of the market for cucumbers and show the equilibrium price, labeled \$20, and the equilibrium quantity, labeled Q_1 .

Part B

Suppose that Gorkeland engages in free trade with other countries and that the world price of cucumbers is \$10 per bushel.

- On your graph in part A, show the world price of cucumbers, labeled \$10, and the quantity of cucumbers sold by domestic producers, labeled Q_2 .
- Will total economic surplus in Gorkeland increase, decrease, or remain the same after engaging in free trade?

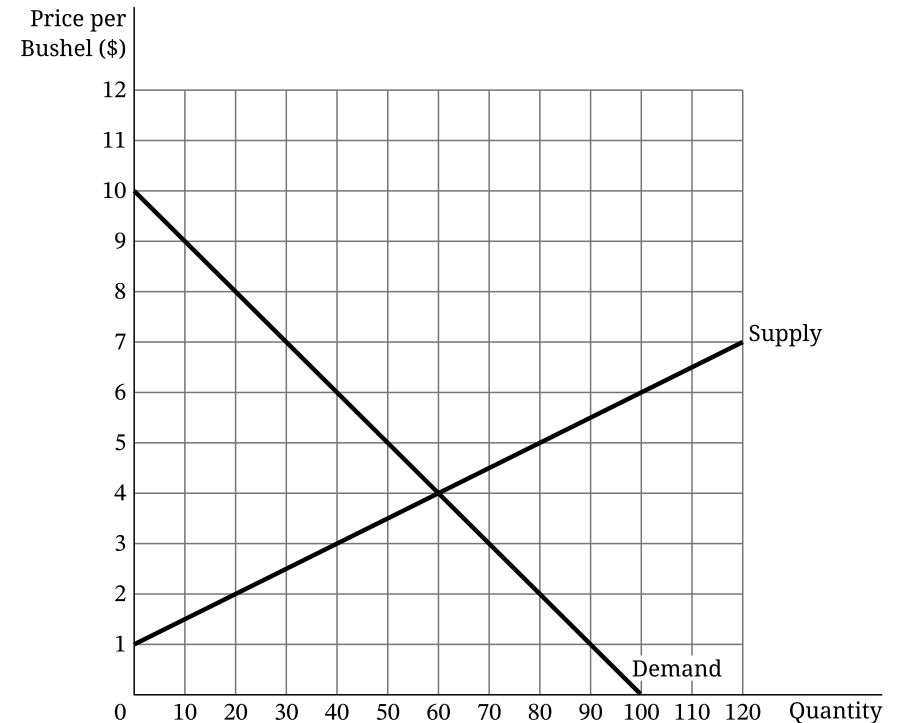
Part C

Now suppose that the government of Gorkeland imposes a \$5 tariff per bushel on the import of cucumbers.

- On your graph in part A, show the new quantity of cucumbers, labeled Q_3 , that will be sold by domestic producers as a result of the \$5 tariff imposed on the import of cucumbers.
- As compared with the free trade described in part B, will domestic producer surplus in the market for cucumbers increase, decrease, or remain the same as a result of the \$5 tariff imposed on the import of cucumbers? Explain.

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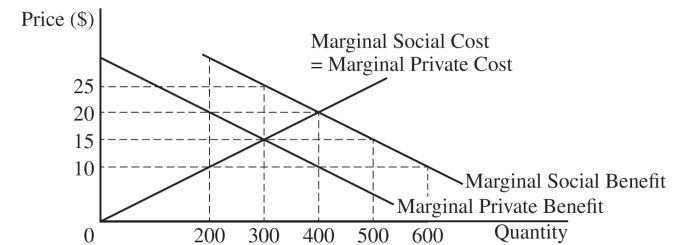
2. The graph provided shows the market for rice in the country of Rushland.



- Calculate the total economic surplus at market equilibrium. Show your work.
- If the government sets a price floor at \$3 per bushel, will there be a surplus, a shortage, or neither? Explain.
- Suppose that instead of the price floor, Rushland engages in international trade and the world price of rice is \$5 per bushel.
 - Will Rushland export or import rice? Explain using numbers from the graph.
 - Calculate the domestic consumer surplus when Rushland engages in international trade. Show your work.
 - Calculate the total revenue that Rushland's farmers will earn at the world price. Show your work.

1. Deskward is a typical profit-maximizing firm that produces and sells wooden desks in a constant-cost, perfectly competitive market that is in long-run equilibrium.
- A. Draw correctly labeled side-by-side graphs for the wooden desk market and for Deskward and show each of the following.
- The market equilibrium price and quantity, labeled P_M and Q_M , respectively
 - Deskward's profit-maximizing price and quantity, labeled P_F and Q_F , respectively
 - Deskward's average total cost curve consistent with long-run equilibrium, labeled ATC
- B. If the monthly rent, a fixed cost, on Deskward's factory building increases, what will happen to the firm's profit-maximizing quantity in the short run? Explain.
- C. Suppose the government is considering granting a per-unit subsidy to producers of wooden desks. On your market graph in part A, show the short-run effect of a per-unit subsidy on each of the following.
- The new market equilibrium price and quantity of wooden desks, labeled P^* and Q^* , respectively
 - The area representing the total cost of the subsidy to the government, shaded completely
- D. Instead of the per-unit subsidy, suppose the government imposes a binding price floor in the market for wooden desks. Will the price floor result in a shortage of wooden desks, a surplus of wooden desks, or neither? Explain.
- E. Deskward also produces chairs. Deskward increases its production from 500 chairs to 600 chairs, and its long-run total cost increases from \$80,000 to \$108,000.
- Calculate Deskward's long-run average total cost of producing 500 chairs. Show your work.
 - As Deskward increases production from 500 chairs to 600 chairs, is Deskward experiencing economies of scale, diseconomies of scale, or the efficient scale? Explain using numbers.

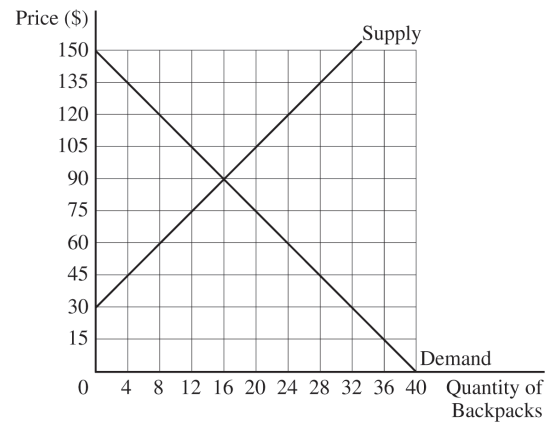
2. Good X is produced and sold in a perfectly competitive market. The provided graph shows the market for Good X.



- Identify the market equilibrium price and quantity.
- Calculate the deadweight loss at the market equilibrium. Show your work.
- Suppose the government wants to eliminate the deadweight loss in the market for Good X.
 - Which of the following will achieve the government's objective: a per-unit tax on consumers or a per-unit subsidy to consumers? Explain.
 - What is the dollar value of the per-unit tax or per-unit subsidy identified in part (c)(i) ?
- Suppose instead the government imposes a price ceiling of \$10. Will the price ceiling achieve the socially optimal quantity of Good X? Explain.

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.

3. Backpacks are produced in a perfectly competitive market that has no externalities. The provided graph shows the market supply and demand curves for backpacks in the country of Jambo.

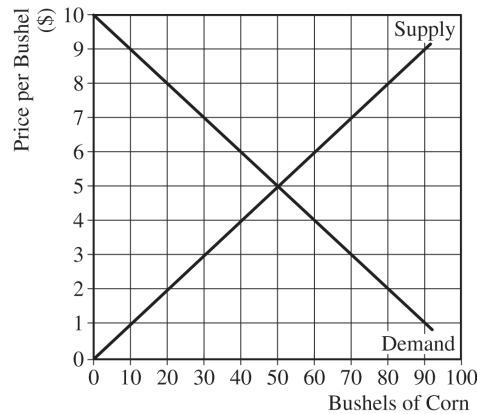


- (a) Calculate total economic surplus at the market equilibrium. Show your work.
- (b) To decrease the price of backpacks for students, the government of Jambo has decided to set a price ceiling of \$60 per backpack. Compared to the market equilibrium, will the quantity of backpacks purchased increase, decrease, or not change as a result of the price ceiling? Explain.
- (c) Suppose instead the government of Jambo provides a per-unit subsidy of \$30 to the sellers of backpacks.
- Identify the price paid by consumers per backpack after the per-unit subsidy is implemented.
 - Calculate the total cost of the subsidy to the government. Show your work.
 - Does the per-unit subsidy cause deadweight loss to increase, decrease, or remain the same compared to the market equilibrium in part (a)? Explain.

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.

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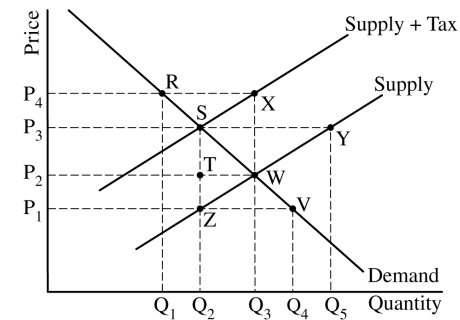
3. The diagram above shows the market for corn in the country of Microland. Corn is produced and sold in a constant-cost, perfectly competitive market.

- (a) Calculate the total revenue earned by corn farmers at the market equilibrium price. Show your work.
- (b) In an attempt to assist corn farmers in Microland, the government sets a \$7 price floor on corn.
 - (i) How many bushels of corn will be exchanged at the price floor?
 - (ii) Calculate the deadweight loss associated with the price floor. Show your work.
 - (iii) Assume the government agrees to buy the unsold quantity at \$7. Calculate the producer surplus. Show your work.
 - (iv) Assume the price floor and the government buying program remain in effect. In addition, assume the demand for corn does not change. In the long run, will the quantity of corn purchased by the government increase, decrease, or remain the same? Explain.

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.

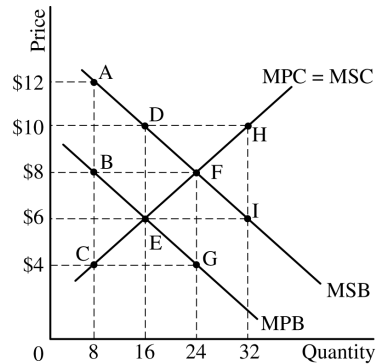
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2. Hats are produced in a perfectly competitive industry, and the government imposes a per-unit sales tax on hats.
 - (a) Using the labeling from the graph, identify each of the following.
 - (i) The after-tax price paid by consumers and the after-tax quantity
 - (ii) The area representing the total tax revenue received by the government
 - (b) Now assume instead that the demand for hats is perfectly inelastic at Q_3 , while the supply and the per-unit tax remain unchanged.
 - (i) Will the after-tax price paid by consumers be higher, lower, or the same compared to the price in your answer to part (a)(i) ?
 - (ii) Will the total tax revenue received by the government be higher, lower, or the same compared to the tax revenue in your answer to part (a)(ii) ? Explain.
 - (c) If the demand for hats remains perfectly inelastic at Q_3 and the per-unit sales tax is reduced, will producer surplus increase, decrease, or stay the same? Explain.

2. Modern-day word processing software gives consumers the ability to create and save documents in different file formats that can then be accessed by multiple computer operating systems. The graph below depicts a perfectly competitive market for word processing software. In the graph, MSB is the marginal social benefit, MPB is the marginal private benefit, MPC is the marginal private cost, and MSC is the marginal social cost.



- Identify the type of market failure illustrated by the graph. Explain.
- Using the numbers on the graph, identify the market equilibrium price and quantity.
- Using the labeling on the graph, identify the area representing the deadweight loss at the quantity identified in part (b).
- Suppose the government is considering granting a subsidy to correct the market failure. What is the dollar value of the per-unit subsidy that would achieve the socially optimal quantity?
- Suppose the government does not grant the subsidy and instead imposes a price floor at \$8.
 - How many units will consumers and producers exchange at the price floor?
 - Does the price floor correct the market failure? Explain.

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.

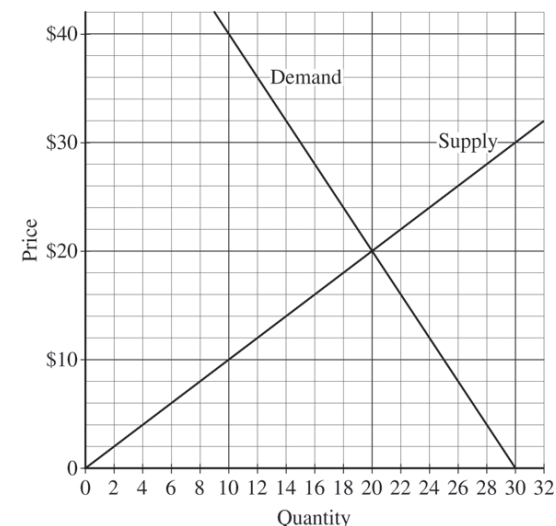
- Corn is used as food and as an input in the production of ethanol, an alternative fuel. Assume corn is produced in a perfectly competitive market.
 - Draw correctly labeled side-by-side graphs for the corn market and a representative corn farmer. On your graphs show each of the following.
 - The equilibrium 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

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.

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.

3. The graph below shows the market for widgets. The government is considering intervening in this market.



- (a) Calculate the total producer surplus at the market equilibrium price and quantity. Show your work.
- (b) If the government imposes a price floor at \$16, is there a shortage, a surplus, or neither? Explain.
- (c) If instead the government imposes a price ceiling at \$12, is there a shortage, a surplus, or neither? Explain.
- (d) If instead the government restricts the market output to 10 units, calculate the deadweight loss. Show your work.
- (e) Assume the price decreases from \$20 to \$12.
 - (i) Calculate the price elasticity of demand. Show your work.
 - (ii) In this price range, is demand perfectly elastic, relatively elastic, unit elastic, relatively inelastic, or perfectly inelastic?

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- (c) Now assume that the monopolist produces 10 units. Using the numbers given in the graph, calculate each of the following. Show your work.
- (i) The monopolist's economic profit
 - (ii) The consumer surplus
 - (iii) The deadweight loss
- (d) At what quantity is demand unit elastic?
- (e) Suppose the monopolist perfectly price discriminates and chooses the quantity that maximizes profit. Determine the dollar value of each of the following.
- (i) The monopolist's profit
 - (ii) The consumer surplus
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2. Ray's Stable hires workers in a perfectly competitive factor market for unskilled labor.

- (a) Using correctly labeled side-by-side graphs for the labor market and Ray's Stable, show each of the following.
- (i) The equilibrium wage and quantity for unskilled labor, labeled W_E and Q_E , respectively
 - (ii) The wage paid by Ray's Stable and the quantity of unskilled labor hired, labeled W_R and Q_R , respectively
- (b) Is the marginal factor cost of unskilled labor for Ray's Stable greater than, less than, or equal to W_E ? Explain.
- (c) Now assume that the government imposes an effective minimum wage for unskilled labor.
- (i) Show the minimum wage on your graphs in part (a), labeled W_{MIN} .
 - (ii) On the labor market graph in part (a), show the quantity of unskilled labor supplied in the labor market as a result of the minimum wage, labeled Q_S .
 - (iii) As a result of the new minimum wage, will the marginal revenue product of the last worker hired by Ray's Stable increase, decrease, or stay the same?