# Chapter 02
# Market Forces: Demand and Supply

**Multiple Choice Questions**

1. In a competitive market, the market demand is $Q^d = 60 - 6P$ and the market supply is $Q^s = 4P$. A price ceiling of $3 will result in a
A. shortage of 30 units.
B. shortage of 15 units.
C. surplus of 30 units.
D. surplus of 12 units.

2. In a competitive market, the market demand is $Q^d = 60 - 6P$ and the market supply is $Q^s = 4P$. The full economic price under a price ceiling of $3 is
A. 6.
B. 7.
C. 8.
D. 9.

3. The buyer side of the market is known as the:
A. income side.
B. demand side.
C. supply side.
D. seller side.

4. The law of demand states that, holding all else constant:
A. as price falls, demand will fall also.
B. as price rises, demand will also rise.
C. price has no effect on quantity demanded.
D. as price falls, quantity demanded rises.

5. Which of the following would not shift the demand for good A?
A. drop in price of good A.
B. drop in price of good B.
C. consumer income.
D. change in the level of advertising of good A.

6. Changes in the price of good A leads to a change in:
A. demand of good A.
B. demand of good B.
C. the quantity demanded of good A.
D. the quantity demanded of good B.

7. A change in income will not lead to:
A. a movement along the demand curve.
B. a leftward shift of the demand curve.
C. a rightward shift of the demand curve.
D. all of the statements associated with the question are correct.

8. Good A is an inferior good, an increase in income leads to:
A. a decrease in the demand for good B.
B. a decrease in the demand for good A.
C. an increase in the demand for good A.
D. no change in the quantity demanded of good A.

9. Which of the following is probably not a normal good?
A. designer dresses.
B. lobster.
C. macaroni and cheese.
D. expensive automobiles.

10. An increase in the price of steak will probably lead to:
A. an increase in demand for chicken.
B. an increase in demand for steak.
C. no change in the demand for steak or chicken.
D. an increase in the supply for chicken.

11. Which of the following pairs of goods are probably complements?
A. televisions and roller skates.
B. frozen yogurt and ice cream.
C. steak and chicken.
D. hamburgers and ketchup.

12. If A and B are complements, an increase in the price of good A would:
A. have no effect on the quantity demanded of B.
B. lead to an increase in demand for B.
C. lead to a decrease in demand for B.
D. none of the statements associated with this question are correct.

13. Graphically, a decrease in advertising will cause the demand curve to:
A. become steeper.
B. shift rightward.
C. become flatter.
D. shift leftward.

14. Persuasive advertising influences demand by:
A. providing information about the availability of a product.
B. offering reduced prices for the product.
C. altering the underlying tastes of consumers.
D. none of the statements are correct.

15. Which of the following can explain an increase in the demand for housing in retirement communities?
A. A drop in real estate prices.
B. An increase in the population of the elderly.
C. A drop in the average age of retirees.
D. Mandatory government legislation.

16. The demand function recognizes that the quantity of a good consumed depends on:
A. the prices of other goods only.
B. price and supply shifters.
C. demand shifters and price.
D. demand shifters only.

17. Suppose the demand for good X is given by $Q^d_x = 10 + a_xP_x + a_yP_y + a_MM$. From the law of demand we know that $a_x$ will be:
A. less than zero.
B. greater than zero.
C. zero.
D. none of the statements associated with this question are correct.

18. Suppose the demand for good X is given by $Q^d_x = 10 + a_xP_x + a_yP_y + a_MM$. If $a_y$ is positive, then:
A. goods y and x are complements.
B. goods y and x are inferior goods.
C. goods y and x are normal goods.
D. goods y and x are substitutes.

19. Suppose the demand for good X is given by $Q^d_x = 10 + a_xP_x + a_yP_y + a_MM$. If $a_M$ is negative, then good y is:
A. a normal good.
B. an inferior good.
C. a complement.
D. a substitute.

20. Suppose the demand for good X is given by $Q^d_x = 10 - 2P_x + P_y + M$. The price of good X is $1, the price of good Y is $10, and income is $100. Given these prices and income, how much of good X will be purchased?
A. 115.
B. 515.
C. 1,000.
D. none of the statements associated with this question are correct.

21. Other things held constant, the greater the price of a good
A. the lower the demand.
B. the higher the demand.
C. the greater the consumer surplus.
D. the lower the consumer surplus.

22. The curve which summarizes the total quantity producers are willing and able to produce at differing prices is the:
A. market demand curve.
B. consumer surplus curve.
C. average cost curve.
D. market supply curve.

23. The law of supply states that, holding all else constant, as the price of a good falls:
A. quantity demanded rises.
B. quantity supplied falls.
C. quantity supplied rises.
D. quantity demanded falls.

24. The economic principle that producers are willing to produce more output when price is high is depicted by the:
A. upward slope of the supply curve.
B. extreme steepness of the supply curve.
C. downward slope of the supply curve.
D. interaction of the supply and demand curves.

25. For a steel factory, a decrease in the cost of electricity to the plant will cause the supply curve to:
A. become flatter.
B. shift to the left.
C. shift to the right.
D. become parallel to the price axis.

26. Changes in the price of a good lead to:
A. changes in the quantity supplied of the good.
B. changes in supply.
C. changes in demand.
D. no effects in quantity supplied or demanded.

27. Technological advances will cause the supply curve to:
A. shift to the left.
B. shift to the right.
C. become flatter.
D. become steeper.

28. An ad valorem tax causes supply curve to:
A. shift to the right.
B. become flatter.
C. become steeper.
D. shift to the left.

29. Suppose the supply of good X is given by $Q^S_x = 10 + 2P_x$. How many units of good X are produced if the price of good X is 20?
A. 10.
B. 20.
C. 30.
D. None of the statements associated with this question are correct.

30. If a shortage exists in a market, the natural tendency is for:
A. demand to increase.
B. price to increase.
C. quantity supplied to decrease.
D. no change in the market.

31. Suppose market demand and supply are given by $Q^d = 100 - 2P$ and $Q^S = 5 + 3P$. The equilibrium price is:
A. $15.
B. $19.
C. $17.
D. $20.

32. Suppose market demand and supply are given by $Q^d = 100 - 2P$ and $Q^S = 5 + 3P$. The equilibrium quantity is:
A. 92.
B. 81.
C. 45.
D. 62.

33. The maximum legal price that can be charged in a market is:
A. a price floor.
B. an ad valorem tax.
C. the market equilibrium price.
D. a price ceiling.

34. Suppose market demand and supply are given by $Q^d = 100 - 2P$ and $Q^S = 5 + 3P$. If a price ceiling of $15 is imposed,
A. there will be a surplus of 40 units.
B. there will be neither a surplus or shortage.
C. there will be a shortage of 40 units.
D. there will be a shortage of 20 units.

35. Suppose market demand and supply are given by $Q^d = 100 - 2P$ and $Q^S = 5 + 3P$. If a price ceiling of $15 is imposed, what will be the resulting full economic price?
A. $19.
B. $21.
C. $6.
D. $25.

36. The minimum legal price that can be charged in a market is:
A. a price floor.
B. a price ceiling.
C. non-pecuniary price.
D. full economic price.

37. Suppose market demand and supply are given by $Q^d = 100 - 2P$ and $Q^S = 5 + 3P$. If a price floor of $30 is set, what will be size of the resulting surplus?
A. 0.
B. 45.
C. 30.
D. 55.

38. Suppose market demand and supply are given by $Q^d = 100 - 2P$ and $Q^S = 5 + 3P$. If the government sets a price floor of $30 and agrees to purchase all surplus at $30 per unit, the total cost to the government will be:
A. $1,650.
B. $1,375.
C. $900.
D. $1,125.

39. If steak is a normal good, what do you suppose would happen to price and quantity during an economic recession?
A. Price would increase and quantity decrease.
B. Price and quantity would both increase.
C. Price and quantity would both decrease.
D. Price would decrease and quantity increase.

40. Suppose you produce wooden desks, and government legislation protecting the spotted owl has made it more expensive for you to purchase wood. What do you expect to happen to the equilibrium price and quantity of wooden desks?
A. Price and quantity will increase.
B. Price will increase but quantity will decrease.
C. Price and quantity will decrease.
D. Price will decrease but quantity will increase.

41. Suppose that supply increases and demand decreases. What effect will this have on price and quantity?
A. Price will increase and quantity may rise or fall.
B. Price will decrease and quantity will increase.
C. Price will decrease and quantity will decrease.
D. None of the statements associated with this question are correct.

42. Suppose both supply and demand decrease. What effect will this have on price?
A. It will fall.
B. It will rise.
C. It may rise or fall.
D. It will remain the same.

43. The law of demand states that if the price of a good falls and all other things remain the same, the
A. quantity demanded of the good falls.
B. quantity demanded of the good rises.
C. demand of the good rises.
D. all of the statements associated with this question are correct.

44. Demand shifters do not include
A. the price of the good.
B. the consumer's income.
C. the level of advertising.
D. the price of the other goods.

45. Changes in the price of other goods lead to
A. a change in quantity demanded.
B. a change in demand.
C. no change in the demand curve.
D. a movement along the demand curve.

46. Good X is a normal good if an increase in income leads to
A. an increase in the supply for good X.
B. an increase in the demand for good X.
C. a decrease in the demand for good X.
D. a decrease in the supply for good X.

47. Which of the following is least likely to be a normal good?
A. Steak.
B. Airline travel.
C. Bologna.
D. A house.

48. Suppose good X is a normal good. Then a decrease in income would lead to
A. an outward shift of the demand curve.
B. an inward shift of the demand curve.
C. no shift of the demand curve.
D. a movement along the demand curve.

49. An inferior good is a good
A. that has low quality.
B. that consumers purchase less of when their incomes are higher.
C. that consumers purchase more when their incomes are higher.
D. of high quality.

50. Suppose that good X is a substitute for good Y. Then an increase in the price of good Y leads to
A. an increase in the demand of good X.
B. a decrease in the demand of good X.
C. a decrease in the supply of good X.
D. an increase in the supply of good X.

51. Which of the following are least likely to be substitutes?
A. Chicken and beef.
B. Cars and trucks.
C. Automobile and housing.
D. Automobile and gasoline.

52. Good Y is a complement to good X if an increase in the price of good Y leads to
A. an increase in the demand for good X.
B. an increase in the supply for good X.
C. a decrease in the demand for good X.
D. a decrease in the supply for good X.

53. Which of the following are least likely to be complements?
A. Peanut butter and jelly.
B. Bread and butter.
C. Sports coats and dress slacks.
D. Cars and trucks.

54. Firms advertise in order to cause the demand for their products to
A. shift to the right.
B. shift to the left.
C. remain unchanged.
D. all of the statements associated with this question are correct.

55. Advertising provides consumers with information about the underlying existence or quality of a product. These types of advertising messages are called
A. persuasive advertising.
B. informative advertising.
C. green advertising.
D. influential advertising.

56. Advertising can influence demand by altering tastes of consumers. This type of advertising is known as
A. persuasive advertising.
B. informative advertising.
C. strategic advertising.
D. influential advertising.

57. Which of the following statements is incorrect?
A. As the population rises, the market demand curve shifts to the right.
B. As a greater fraction of the population becomes elderly, the demand for medical services will tend to increase.
C. Changes in the composition of the population affect the demand for a product.
D. none of the statements associated with this question are incorrect.

58. If consumers expect future prices to be higher
A. they substitute current purchases for future purchases of perishable products.
B. stockpiling will happen when products are durable in nature.
C. the position of the demand will not change.
D. the demand for automobiles today will not change.

59. The demand function
A. describes how much of good X will be purchased at the alternative price of good X, given all the other variables being constant.
B. recognizes that the quantity of a good consumed depends on its price and demand shifters.
C. shows the relationship between the quantity demanded of X and variables other than its price.
D. does not include expectations.

60. Which of the following is a linear demand function?
A. $Q_x^d = \alpha_0 + \alpha_X P_X + \alpha_Y P_Y + \alpha_M M + \alpha_H H$.
B. $Q_x^d = \alpha P_X^{\alpha X} P_Y^{\alpha Y} M^{\alpha M} H^{\alpha H}$.
C. $Q_x^d = \alpha_0 + \alpha_X P_X^2 + \alpha_Y P_Y^2 + \alpha_M M^2 + \alpha_M H^2$.
D. $Q_x^d = \alpha + \alpha_X \log P_X + \alpha_Y \log P_Y + \alpha_M \log M + \alpha_M \log H$.

61. Good X is a normal good and its demand is given by $Q_x^d = \alpha_0 + \alpha_X P_X + \alpha_Y P_Y + \alpha_M M + \alpha_H H$. Then we know that
A. $\alpha_H > 0$.
B. $\alpha_X > 0$.
C. $\alpha_Y > 0$.
D. $\alpha_M > 0$.

62. Suppose X and Y are complements and demand for X is $Q_x^d = \alpha_0 + \alpha_X P_X + \alpha_Y P_Y + \alpha_M M + \alpha_H H$. Then we know
A. $\alpha_H > 0$.
B. $\alpha_X > 0$.
C. $\alpha_Y < 0$.
D. $\alpha_M < 0$.

63. Suppose the demand for X is given by $Q_x^d = 100 - 2P_X + 4P_Y + 10M + 2A$, where $P_X$ represents the price of good X, $P_Y$ is the price of good Y, M is income and A is the amount of advertising on good X. Based on this information, we know that good Y is
A. a substitute for good X.
B. a complement for good X.
C. an inferior good.
D. a normal good.

64. Suppose the demand for X is given by $Q_x^d = 100 - 2P_X + 4P_Y + 10M + 2A$, where $P_X$ represents the price of good X, $P_Y$ is the price of good Y, M is income and A is the amount of advertising on good X. Based on this information, we know that good X is a
A. substitute for good Y and a normal good.
B. complement for good Y and an inferior good.
C. complement for good Y and a normal good.
D. substitute for good Y and an inferior good.

65. Suppose the demand for X is given by $Q_x^d = 100 - 2P_X + 4P_Y + 10M + 2A$, where $P_X$ represents the price of good X, $P_Y$ is the price of good Y, M is income and A is the amount of advertising on good X. If advertising on good X increases by $10,000, then the demand for X will
A. decrease by $20,000.
B. decrease by $100,000.
C. increase by $100,000.
D. increase by $20,000.

66. Suppose the demand for X is given by $Q_x^d = 100 - 2P_X + 4P_Y + 10M + 2A$, where $P_X$ represents the price of good X, $P_Y$ is the price of good Y, M is income and A is the amount of advertising on good X. Good X is
A. an inferior good.
B. a normal good.
C. a Giffin good.
D. a complement.

67. Consumer surplus is
A. the value consumers get from a supplier.
B. the value consumers do not pay because of a discount by supplier.
C. the value consumers get from a good but do not pay for.
D. equal to the amount consumers pay for a good.

68. If the price of good X becomes lower, then the level of consumer surplus becomes
A. lower.
B. higher.
C. unchanged.
D. lower in the short-run but higher in the long run.

69. The market supply curve indicates the total quantity all producers in a competitive market would produce at each price,
A. holding only input price fixed.
B. allowing input price to vary.
C. holding all supply shifters fixed.
D. allowing all supply shifters to vary.

70. Which of the following is not a supply shifter?
A. Level of technology.
B. Prices of inputs.
C. Average income level.
D. Weather.

71. If the price of an input rises, producers are willing to produce
A. more output at each given price.
B. less output at each given price.
C. the same output at each given price.
D. none of the statements associated with this question are correct.

72. As additional firms enter an industry, the market supply curve
A. shifts to the right.
B. shifts to the left.
C. remains the same.
D. none of the statements associated with this question are correct.

73. An excise tax shifts the supply curve
A. down by the amount of the tax.
B. up by the amount of the tax.
C. by rotating it counter-clockwise.
D. by rotating it clockwise.

74. An ad valorem tax shifts the supply curve
A. down by the amount of the tax.
B. up by the amount of the tax.
C. by rotating it counter-clockwise.
D. by rotating it clockwise.

75. If firms expect prices to be higher in the future and the product is not perishable, then
A. the current supply curve shifts to the left.
B. the current supply curve shifts to the right.
C. producers produce more output to hold back for the future.
D. none of the statements associated with this question are correct.

76. The supply function
A. describes how much of good X will be produced at an alternative price of good X, given all the other variables being constant.
B. recognizes that the quantity of a good produced depends on its price and supply shifters.
C. shows the relationship between the quantity supplied of X and variables other than its price.
D. does not include technology.

77. The supply function for good X is given by $Q_x^S = 1{,}000 + P_X - 5P_Y - 2P_W$, where $P_X$ is the price of X, $P_Y$ is the price of good Y and $P_W$ is the price of input W. If the price of input W increases by $10, then the supply of good X
A. will increase by 10 units.
B. will increase by 20 units.
C. will decrease by 10 units.
D. none of the statements associated with this question are correct.

78. The supply function for good X is given by $Q_x^s = 1{,}000 + P_X - 5P_Y - 2P_W$, where $P_X$ is the price of X, $P_Y$ is the price of good Y and $P_W$ is the price of input W. If $P_X = 100$, $P_Y = 150$, $P_W = 50$, then the supply curve is
A. $Q_x^s = 550$.
B. $Q_x^s = 150 + P_x$.
C. $Q_x^s = 550 + P_x$.
D. $Q_x^s = 150 + P_x$.

79. If an excise tax is imposed on a good, then the supply curve
A. shifts up by the amount of the demand elasticity.
B. does not change.
C. shifts down by the amount of the tax.
D. shifts up by the amount of the tax.

80. Producer surplus is the
A. area above the supply curve but below the demand curve.
B. area above the supply curve but below the market price of the good.
C. minimum amount required by a producer for producing the good.
D. maximum amount a producer can collect from consumers.

81. When quantity demanded exceeds quantity supplied
A. there exists a surplus of a good.
B. the price tends to fall.
C. the price is below the equilibrium price.
D. there is no excess demand.

82. Competitive market equilibrium
A. is determined by the intersection of the market demand and supply curves.
B. implies that quantity supplied is sufficiently larger than quantity demanded.
C. is determined by the intersection of the excess demand and excess supply curves.
D. implies that quantity demanded is sufficiently larger than quantity supplied.

83. A price ceiling is
A. the minimum legal price that can be charged in a market.
B. the maximum legal price that can be charged in a market.
C. above the initial equilibrium price.
D. equal to the initial equilibrium price.

84. Under a price ceiling, the full economic price is
A. the dollar price paid to the firm.
B. the opportunity cost of not being able to buy a good when a consumer needs it.
C. lower than the free-market price.
D. higher than the free-market price.

85. When an effective price ceiling is in place
A. every consumer is better off.
B. every consumer is worse off.
C. some consumers are better off and others are worse off.
D. on average the net change in consumer surplus is zero.

86. A floor price is
A. the minimum legal price that can be charged in a market.
B. the maximum legal price that can be charged in a market.
C. below the initial market equilibrium price.
D. equal to the initial market equilibrium price.

87. The minimum wage
A. is an example of floor price.
B. leads to an increase in the number of people employed in unskilled jobs.
C. leads to a decrease in the number of people employed in skilled jobs.
D. causes an increase in social welfare.

88. If demand increases, then the
A. demand curve shifts to the left.
B. demand curve shifts to the right.
C. equilibrium price goes down.
D. equilibrium quantity goes down.

89. If supply increases, then the
A. supply curve shifts to the left.
B. equilibrium price goes down.
C. equilibrium quantity goes down.
D. demand curve shifts to the right.

90. Producer surplus is measured as the area
A. below the demand curve and above the market price.
B. above the demand curve and below the market price.
C. above the supply curve and below the market price.
D. below the supply curve and above the market price.

91. When government imposes a price floor above the market price, the result will be that
A. surpluses occur.
B. shortages become a problem.
C. supply and demand will shift up to the new equilibrium.
D. a price floor set above the equilibrium price will have no effect on the market equilibrium.

92. Jane pays the market price of $69 for a new pair of running shoes, even though she would be happy to pay a maximum of $100 for the same pair of shoes. This is an example of the concept of
A. producer surplus.
B. price ceilings.
C. full economic prices.
D. consumer surplus.

93. In a competitive market, the market demand is $Q^d = 70 - 3P$ and the market supply is $Q^s = 6P$. A price ceiling of $4 will result in a
A. shortage of 24 units.
B. shortage of 34 units.
C. surplus of 58 units.
D. surplus of 34 units.

94. The law of demand indicates that as the price of a good increases, the quantity that
A. producers willing to produce an item increases.
B. producers willing to produce an item decreases.
C. buyers are able to purchase increases.
D. buyers are able to purchase decreases.

95. Which of the following is probably not a normal good?
A. Designer jeans.
B. Diamond rings.
C. Intercity passenger bus travel.
D. New automobiles.

96. Which of the following pairs of goods are probably complements?
A. Electricity and natural gas.
B. Butter and margarine.
C. Steak and chicken.
D. Ketchup and French fries.

97. Graphically, an increase in the number of vegetarians will cause the demand curve for Tofu (a meat substitute) to
A. shift rightward.
B. shift leftward.
C. become flatter.
D. become steeper.

98. Suppose the demand for good X is given by $Q^d_x = 20 - 4P_x + 2P_y + M$. The price of good X is $5, the price of good Y is $15, and income is $150. Given these prices and income, how much of good X will be purchased?
A. 160.
B. 180.
C. 220.
D. None of the statements associated with this question are correct.

99. For a wood furniture manufacturer, an increase in the cost of lumber will cause the supply curve to:
A. become flatter.
B. become steeper.
C. shift to the left.
D. shift to the right.

100. Demand shifters do not include the
A. price of the good.
B. consumer's tastes and preferences.
C. the price of the other related goods.
D. consumer's expectations about future prices of the good.

101. Good X is an inferior good if a decrease in income leads to
A. an increase in the supply of good X.
B. a decrease in the supply of good X.
C. an increase in the demand for good X.
D. a decrease in the demand for good X.

102. All else held constant, as additional firms enter an industry
A. more output is available at each given price.
B. less output is available at each given price.
C. the same output is available at each given price.
D. output could increase or decrease at each given price.

103. An excise tax of $1.00 per gallon of gasoline placed on the suppliers of gasoline, would shift the supply curve
A. down by $1.00.
B. down by more than $1.00.
C. up by $1.00.
D. up by less than $1.00.

104. Suppose there is a simultaneous increase in demand and decrease in supply, what effect will this have on the equilibrium price?
A. It will rise.
B. It will fall.
C. It may rise or fall.
D. It will remain the same.

105. Given a linear demand function of the form $Q_X^d = 100 - 0.5P_X$, find the inverse linear demand function.
A. $P_X = 200 - 2Q_X$.
B. $P_X = 100 - 0.5Q_X$.
C. $P_X = 100 - 2Q_X$.
D. $P_X = 100Q_X - 0.5P_X$.

106. Given a linear demand function of the form $Q_X^d = 500 - 2P_X - 3P_Y + 0.01M$, find the inverse linear demand function assuming $M = 20{,}000$ and $P_Y = 10$.
A. $P_X = 500 - 2Q_X - 3P_Y + 0.01M$.
B. $P_X = 335 - 0.5Q_X$.
C. $P_X = 335 - 2Q_X$.
D. $P_X = 500 - 2Q_X$.

107. Given a linear supply function of the form $Q_X^S = -10 + 5P_X$, find the inverse linear supply function.
A. $P_X = 2 + 0.2Q_X$.
B. $P_X = -10 + 0.2Q_X$.
C. $P_X = -10 + 5Q_X$.
D. $P_X = 2 + 5Q_X$.

108. Given a linear supply function of the form $Q_X^S = 3{,}000 + 3P_X - 2P_r - P_w$, find the inverse linear supply function assuming $P_r = \$1{,}000$ and $P_w = \$100$.
A. $Q_X^S = 900 + 3P_X$.
B. $P_X = 300 + 0.3333Q_X$.
C. $P_X = -300 + 0.3333Q_X$.
D. $P_X = 2{,}900 + 3P_X$.

109. Suppose the market demand for good X is given by $Q_X^d = 20 – 2P_X$. If the equilibrium price of X is $5 per unit then consumer surplus is
A. $100.
B. $75.
C. $50.
D. $25.

110. Suppose the market demand for good X is given by $Q_X^d = 20 - 2P_X$. If the equilibrium price of X is $5 per unit, then the total value a consumer receives from consuming the equilibrium quantity is
A. $100.
B. $75.
C. $50.
D. $25.

111. Suppose the market demand for good X is given by $Q_X^d = 20 - 2P_X$. If the equilibrium price of X is $5 per unit then consumers' expenditure on X is
A. $5.
B. $25.
C. $50.
D. cannot be determined from the information contained in the question.

112. Suppose the market supply for good X is given by $Q_X^S = -100 + 5P_X$. If the equilibrium price of X is $100 per unit then producer surplus is
A. $400.
B. $1,600.
C. $16,000.
D. none of the statements associated with this question are correct.

113. Suppose the market supply for good X is given by $Q_X^S = -100 + 5P_X$. If the equilibrium price of X is $100 per unit then producers' revenue from X is
A. $100.
B. $20,000.
C. $40,000.
D. cannot be determined from the information contained in the question.

114. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. Compute the surplus received by consumers and producers.
A. $24 and $24, respectively.
B. $4 and $4, respectively.
C. $2 and $6, respectively.
D. $6 and $2, respectively.

115. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. Compute the equilibrium price and quantity in this market.
A. $24 and 24 units, respectively.
B. $4 and 4 units, respectively.
C. $2 and 6 units, respectively.
D. $6 and 2 units, respectively.

116. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. Compute the number of units and the price at which those units will be exchanged when there is an $8 per unit price floor.
A. 1 unit and $6 per unit.
B. 1 unit and $8 per unit.
C. 3 units and $6 per unit.
D. 3 units and $8 per unit.

117. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. An $8 per unit price floor will result in a
A. shortage of 1 unit.
B. surplus of 2 units.
C. shortage of 3 units.
D. surplus of 3 units.

118. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. Compute the surplus consumers receive when an $8 per unit price floor is imposed on the market.
A. $0.
B. $1.
C. $3.
D. $5.

119. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. Compute the surplus producers receive when an $8 per unit price floor is imposed on the market.
A. $1.
B. $2.
C. $32.
D. $33.

120. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. Compute the loss in social welfare when an $8 per unit price floor is imposed on the market.
A. $0.
B. $1.
C. $2.
D. $3.

121. The seller side of the market is known as the:
A. income side.
B. demand side.
C. supply side.
D. seller side.

122. Suppose both supply and demand increase. What effect will this have on the equilibrium price?
A. it will fall.
B. it will rise.
C. it may rise or fall.
D. it will remain the same.

123. Suppose both supply and demand increase. What effect will this have on the equilibrium quantity?
A. it will fall.
B. it will rise.
C. it may rise or fall.
D. it will remain the same.

124. Suppose supply decreases and demand increases. What effect will this have on the price?
A. it will fall.
B. it will rise.
C. it may rise or fall.
D. it will remain the same.

125. Suppose supply decreases and demand increases. What effect will this have on the quantity?
A. it will fall.
B. it will rise.
C. it may rise or fall.
D. it will remain the same.

126. In a competitive market, the market demand is $Q^d = 60 - 6P$ and the market supply is $Q^s = 4P$. A price floor of $9 will result in a
A. shortage of 30 units.
B. shortage of 12 units.
C. surplus of 30 units.
D. surplus of 12 units.

127. Other things held constant, the lower the price of a good
A. the lower the demand.
B. the higher the demand.
C. the greater the consumer surplus.
D. the lower the consumer surplus.

128. Other things held constant, the higher the price of a good
A. the lower the producer surplus.
B. the greater the producer surplus.
C. the higher the supply.
D. the lower the supply.

129. Other things held constant, the lower the price of a good
A. the lower the producer surplus.
B. the greater the producer surplus.
C. the higher the supply.
D. the lower the supply.

130. If A and B are substitute goods, an increase in the price of good A would:
A. have no effect on the quantity demanded of B.
B. lead to an increase in demand for B.
C. lead to a decrease in demand for B.
D. none of the statements associated with this question are correct.

131. If A and B are substitute goods, a decrease in the price of good A would:
A. have no effect on the quantity demanded of B.
B. lead to an increase in demand for B.
C. lead to a decrease in demand for B.
D. none of the statements associated with this question are correct.

132. If A and B are complementary goods, a decrease in the price of good A would:
A. have no effect on the quantity demanded of B.
B. lead to an increase in demand for B.
C. lead to a decrease in demand for B.
D. none of the statements associated with this question are correct.

133. An excise tax of $1.00 per gallon of gasoline placed on the suppliers of gasoline in a market with downward sloping demand and upward sloping supply would raise the equilibrium price
A. exactly $1.00 per gallon.
B. by less than $1.00 per gallon.
C. by more than $1.00 per gallon.
D. too little information to determine the impact on the equilibrium price.

134. Consider a market characterized by the following demand and supply conditions: $P_X = 15 - 2Q_X$ and $P_X = 3 + 2Q_X$. The equilibrium price and quantity are, respectively,
A. $3 and 9 units.
B. $9 and 3 units.
C. $12 and 4 units.
D. $4 and 12 units.

135. Consider a market characterized by the following demand and supply conditions: $P_X = 50 - 5Q_X$ and $P_X = 32 + Q_X$. The equilibrium price and quantity are, respectively,
A. $35 and 3 units.
B. $3 and 35 units.
C. $82 and 50 units.
D. $20 and 6 units.

**Essay Questions**

136. When Iraq invaded Kuwait, the market price of crude petroleum jumped from $21.54 per barrel to $30.50 per barrel - an increase of almost 42 percent. Your boss is puzzled, because the price increase actually occurred before there was a physical reduction in the current amount of oil available for sale.
a. Explain why the price of oil increased so rapidly.
b. One year after the invasion, the price of oil fell to $21.32 per barrel, its prewar level. Explain why.

137. Caviar and champagne are complements. Recently pollution has been a problem in the Volga River, where much of the world's caviar originates. The sturgeon that live in these waters are laying fewer eggs than before. Show graphically and explain the effects on the market for caviar and the market for champagne.

138. In the early part of 1998, crude oil prices fell to a nine-year low at $13.28 a barrel. Falling crude oil prices were due in part to technological advances that made locating reservoirs and extraction cheaper. What impact will these lower crude oil prices have on the price of gasoline?

139. You are an aide for the Senate Banking Committee Chairman. He comes to you with a bill that proposes setting limits on what ATM owners can charge nonaccount holders, over and above what banks charge their own customers. Currently, large banks charge noncustomers an average fee of $1.35 per transaction in addition to the fees the customer's own bank imposes. The Senator asks you to look at a proposal that would place a $0.50 cap on the fees ATM owners can charge noncustomer for accessing their money. If this legislation is enacted, what would be the likely effects?

140. Apples and oranges are substitutes. A freeze in Florida destroys most of the orange crop. What would you expect to happen to the market for the following:
a. Oranges?
b. Apples?
c. Orange juice?

141. In 1987 a 386 PC sold at a price of $6,995. Five years later, you could purchase essentially the same computer for $1,495. Today, you can purchase a faster Pentium for a fraction of the initial price of a slower 386 PC.
a. Why have computer prices fallen so dramatically?
b. What impact, if any, do you think the growing use of the Internet will have on the price of computers?

142. American Tennishoe, Inc., is concerned because Congress has proposed an excise tax of $1 on each pair of tennis shoes sold in the United States. They are lobbying against the tax through an advertising campaign that says the tax will raise the price of tennis shoes by $1. Use supply and demand graphs to show how much of the tax will actually be passed on to consumers.

143. RB, Inc., is a wholesaler specializing in dry foods, such as rice and dry beans. Its manager is troubled by a recent article in *The Wall Street Journal* that say a recession in imminent and that income will fall by 3 percent over the next year. What do you think is likely to happen to the price of the products RB, Inc., sells? Why?

144. Consider the market for two goods that are substitutes, such as pens and pencils. If a technological breakthrough reduced the cost of producing pens:
a. What would happen to the supply of pens?
b. What would happen to the price of pens and the quantity exchanged?
c. What effect would this change in the price of pens have on the market for pencils?

145. Russian state television has imposed a temporary ban on all TV commercials. Your firm specializes in exports to Russia. 90 percent of it sales consist of consumer goods shipped to Russia. Your supervisor wants to know the likely impact of the ban on your firm's operations. What do you tell her?

146. The federal government recently decided to raise the excise tax on hard liquor.
a. Graphically illustrate the effects of this tax on the market for hard liquor.
b. Would a $1 increase in the excise tax on liquor increase the equilibrium price of liquor by $1? Explain.
c. How would the excise tax on hard liquor affect a beer distributor?

147. Estimates suggest that the North American Free Trade Agreement (NAFTA) will ultimately result in tariff cuts averaging 38 percent globally. Assuming these estimates are correct, would you expect the price of the average imported goods to fall by 38 percent? Explain.

148. The government decides that a specific scarce good should be provided for everyone who wants it at a price of zero and passes a law making it illegal to buy or sell the good. However, people can give the good away. This good is highly desirable for some of the population. What effect will this law have on the market? What would happen in this market if the law were removed?

149. You are the manager of a car dealership that sells luxury automobiles, which are normal goods. Although a recession is expected next year, you expect your clients' incomes to increase over the coming year. What will you do about ordering cars for next year as compared to last year? Why?

150. You are the manager of Fast & Easy Donuts. Almost all of your donut sales are derived from the drive-through window. You know from experience that coffee is a complement for your donuts. The morning newspaper says that a major storm has just destroyed 50 percent of this year's coffee bean crop. Will this affect how much flour you order? Will it affect how many employees you schedule? What will happen to prices?

151. You are an economic advisor to the Treasurer of the United States. Congress is considering increasing the sales tax on gasoline by $.03 per gallon. Last year motorists purchased 10 million gallons of gas per month. The demand curve is such that every $.01 increase in price decreases sales by 100,000 gallons per month. You also know that for every $.01 increase in price, producers are willing to provide 50,000 more gallons of gasoline to the market. The legislature has stated that the $.03 tax will increase government revenues by $300,000 per month and raise the price of gasoline by $.03 per gallon. Is this correct?

152. Suppose you are an aide to a U.S. Senator who is concerned about the impact of a recently proposed excise tax on the welfare of her constituents. You explained to the Senator that one way of measuring the impact on her constituents is to determine how the tax change affects the level of consumer surplus enjoyed by the constituents. Based on your arguments, you are given the go-ahead to conduct a formal analysis, and obtain the following estimates of demand and supply: $Q^d = 500 - 5P$ and $Q^S = 2P - 60$.
a. Graph the supply and demand curves.
b. What are the equilibrium quantity and equilibrium price?
c. How much consumer surplus exists in this market?
d. If a $2 excise tax is levied on this good, what will happen to the equilibrium price and quantity?
e. What will the consumer surplus be after the tax?

153. The demand for your product has been estimated to be $Q_x^d = 7{,}880 - 4P_x - 2P_y + P_z - .1M$. The relevant price and income data are as follows: $P_x = 10$, $P_y = 15$, $P_z = 50$, $M = 40{,}000$.
a. Which goods are substitutes for X? Which are complements?
b. Is X an inferior or a normal good?
c. How much X will be purchased?
d. Graph the demand curve for X given the above information.
e. How will the demand curve change if M falls to 35,000?

154. Suppose the supply curve for a product is given by $Q_x^S = -300 + 4P_x + 2P_z$ and $P_x = 30$, $P_z = 40$.
a. How much X is produced?
b. What is the inverse supply curve for X given the above information?
c. Graph this supply curve.
d. Show what happens to this supply curve if the price of Z goes up by $10.

155. Recently, the Brazilian Association of Citrus Exports (Abecitrus) announced that orange production would be down 25 percent this year because of poor weather conditions, disease, and tree stress resulting from three straight bumper crops. What effect will the decreased production of oranges have on the demand for tomato juice?

# Chapter 02 Market Forces: Demand and Supply Answer Key

**Multiple Choice Questions**

1. In a competitive market, the market demand is $Q^d = 60 - 6P$ and the market supply is $Q^s = 4P$. A price ceiling of $3 will result in a
**A.** shortage of 30 units.
B. shortage of 15 units.
C. surplus of 30 units.
D. surplus of 12 units.

*Difficulty: Medium*

2. In a competitive market, the market demand is $Q^d = 60 - 6P$ and the market supply is $Q^s = 4P$. The full economic price under a price ceiling of $3 is
A. 6.
B. 7.
**C.** 8.
D. 9.

*Difficulty: Hard*

3. The buyer side of the market is known as the:
A. income side.
**B.** demand side.
C. supply side.
D. seller side.

*Difficulty: Easy*

4. The law of demand states that, holding all else constant:
A. as price falls, demand will fall also.
B. as price rises, demand will also rise.
C. price has no effect on quantity demanded.
**D.** as price falls, quantity demanded rises.

*Difficulty: Medium*

5. Which of the following would not shift the demand for good A?
**A.** drop in price of good A.
B. drop in price of good B.
C. consumer income.
D. change in the level of advertising of good A.

*Difficulty: Easy*

6. Changes in the price of good A leads to a change in:
A. demand of good A.
B. demand of good B.
**C.** the quantity demanded of good A.
D. the quantity demanded of good B.

*Difficulty: Medium*

7. A change in income will not lead to:
**A.** a movement along the demand curve.
B. a leftward shift of the demand curve.
C. a rightward shift of the demand curve.
D. all of the statements associated with the question are correct.

*Difficulty: Medium*

8. Good A is an inferior good, an increase in income leads to:
A. a decrease in the demand for good B.
**B.** a decrease in the demand for good A.
C. an increase in the demand for good A.
D. no change in the quantity demanded of good A.

*Difficulty: Easy*

9. Which of the following is probably not a normal good?
A. designer dresses.
B. lobster.
**C.** macaroni and cheese.
D. expensive automobiles.

*Difficulty: Easy*

10. An increase in the price of steak will probably lead to:
**A.** an increase in demand for chicken.
B. an increase in demand for steak.
C. no change in the demand for steak or chicken.
D. an increase in the supply for chicken.

*Difficulty: Medium*

11. Which of the following pairs of goods are probably complements?
A. televisions and roller skates.
B. frozen yogurt and ice cream.
C. steak and chicken.
**D.** hamburgers and ketchup.

*Difficulty: Easy*

12. If A and B are complements, an increase in the price of good A would:
A. have no effect on the quantity demanded of B.
B. lead to an increase in demand for B.
**C.** lead to a decrease in demand for B.
D. none of the statements associated with this question are correct.

*Difficulty: Medium*

13. Graphically, a decrease in advertising will cause the demand curve to:
A. become steeper.
B. shift rightward.
C. become flatter.
**D.** shift leftward.

*Difficulty: Easy*

14. Persuasive advertising influences demand by:
A. providing information about the availability of a product.
B. offering reduced prices for the product.
**C.** altering the underlying tastes of consumers.
D. none of the statements are correct.

*Difficulty: Medium*

15. Which of the following can explain an increase in the demand for housing in retirement communities?
A. A drop in real estate prices.
**B.** An increase in the population of the elderly.
C. A drop in the average age of retirees.
D. Mandatory government legislation.

*Difficulty: Medium*

16. The demand function recognizes that the quantity of a good consumed depends on:
A. the prices of other goods only.
B. price and supply shifters.
**C.** demand shifters and price.
D. demand shifters only.

*Difficulty: Easy*

17. Suppose the demand for good X is given by $Q^d_x = 10 + a_xP_x + a_yP_y + a_MM$. From the law of demand we know that $a_x$ will be:
**A.** less than zero.
B. greater than zero.
C. zero.
D. none of the statements associated with this question are correct.

*Difficulty: Easy*

18. Suppose the demand for good X is given by $Q^d_x = 10 + a_xP_x + a_yP_y + a_MM$. If $a_y$ is positive, then:
A. goods y and x are complements.
B. goods y and x are inferior goods.
C. goods y and x are normal goods.
**D.** goods y and x are substitutes.

*Difficulty: Easy*

19. Suppose the demand for good X is given by $Q^d_x = 10 + a_xP_x + a_yP_y + a_MM$. If $a_M$ is negative, then good y is:
A. a normal good.
**B.** an inferior good.
C. a complement.
D. a substitute.

*Difficulty: Easy*

20. Suppose the demand for good X is given by $Q^d_x = 10 - 2P_x + P_y + M$. The price of good X is $1, the price of good Y is $10, and income is $100. Given these prices and income, how much of good X will be purchased?
A. 115.
B. 515.
C. 1,000.
**D.** none of the statements associated with this question are correct.

*Difficulty: Medium*

21. Other things held constant, the greater the price of a good
A. the lower the demand.
B. the higher the demand.
C. the greater the consumer surplus.
**D.** the lower the consumer surplus.

*Difficulty: Medium*

22. The curve which summarizes the total quantity producers are willing and able to produce at differing prices is the:
A. market demand curve.
B. consumer surplus curve.
C. average cost curve.
**D.** market supply curve.

*Difficulty: Easy*

23. The law of supply states that, holding all else constant, as the price of a good falls:
A. quantity demanded rises.
**B.** quantity supplied falls.
C. quantity supplied rises.
D. quantity demanded falls.

*Difficulty: Easy*

24. The economic principle that producers are willing to produce more output when price is high is depicted by the:
**A.** upward slope of the supply curve.
B. extreme steepness of the supply curve.
C. downward slope of the supply curve.
D. interaction of the supply and demand curves.

*Difficulty: Easy*

25. For a steel factory, a decrease in the cost of electricity to the plant will cause the supply curve to:
A. become flatter.
B. shift to the left.
**C.** shift to the right.
D. become parallel to the price axis.

*Difficulty: Medium*

26. Changes in the price of a good lead to:
**A.** changes in the quantity supplied of the good.
B. changes in supply.
C. changes in demand.
D. no effects in quantity supplied or demanded.

*Difficulty: Easy*

27. Technological advances will cause the supply curve to:
A. shift to the left.
**B.** shift to the right.
C. become flatter.
D. become steeper.

*Difficulty: Easy*

28. An ad valorem tax causes supply curve to:
A. shift to the right.
B. become flatter.
**C.** become steeper.
D. shift to the left.

*Difficulty: Medium*

29. Suppose the supply of good X is given by $Q^S_x = 10 + 2P_x$. How many units of good X are produced if the price of good X is 20?
A. 10.
B. 20.
C. 30.
**D.** None of the statements associated with this question are correct.

*Difficulty: Easy*

30. If a shortage exists in a market, the natural tendency is for:
A. demand to increase.
**B.** price to increase.
C. quantity supplied to decrease.
D. no change in the market.

*Difficulty: Medium*

31. Suppose market demand and supply are given by $Q^d = 100 - 2P$ and $Q^S = 5 + 3P$. The equilibrium price is:
A. $15.
**B.** $19.
C. $17.
D. $20.

*Difficulty: Medium*

32. Suppose market demand and supply are given by $Q^d = 100 - 2P$ and $Q^S = 5 + 3P$. The equilibrium quantity is:
A. 92.
B. 81.
C. 45.
**D.** 62.

*Difficulty: Medium*

33. The maximum legal price that can be charged in a market is:
A. a price floor.
B. an ad valorem tax.
C. the market equilibrium price.
**D.** a price ceiling.

*Difficulty: Easy*

34. Suppose market demand and supply are given by $Q^d = 100 - 2P$ and $Q^S = 5 + 3P$. If a price ceiling of $15 is imposed,
A. there will be a surplus of 40 units.
B. there will be neither a surplus or shortage.
C. there will be a shortage of 40 units.
**D.** there will be a shortage of 20 units.

*Difficulty: Medium*

35. Suppose market demand and supply are given by $Q^d = 100 - 2P$ and $Q^S = 5 + 3P$. If a price ceiling of $15 is imposed, what will be the resulting full economic price?
A. $19.
B. $21.
C. $6.
**D.** $25.

*Difficulty: Medium*

36. The minimum legal price that can be charged in a market is:
**A.** a price floor.
B. a price ceiling.
C. non-pecuniary price.
D. full economic price.

*Difficulty: Easy*

37. Suppose market demand and supply are given by $Q^d = 100 - 2P$ and $Q^S = 5 + 3P$. If a price floor of $30 is set, what will be size of the resulting surplus?
A. 0.
B. 45.
C. 30.
**D.** 55.

*Difficulty: Medium*

38. Suppose market demand and supply are given by $Q^d = 100 - 2P$ and $Q^S = 5 + 3P$. If the government sets a price floor of $30 and agrees to purchase all surplus at $30 per unit, the total cost to the government will be:
**A.** $1,650.
B. $1,375.
C. $900.
D. $1,125.

*Difficulty: Medium*

39. If steak is a normal good, what do you suppose would happen to price and quantity during an economic recession?
A. Price would increase and quantity decrease.
B. Price and quantity would both increase.
**C.** Price and quantity would both decrease.
D. Price would decrease and quantity increase.

*Difficulty: Medium*

40. Suppose you produce wooden desks, and government legislation protecting the spotted owl has made it more expensive for you to purchase wood. What do you expect to happen to the equilibrium price and quantity of wooden desks?
A. Price and quantity will increase.
**B.** Price will increase but quantity will decrease.
C. Price and quantity will decrease.
D. Price will decrease but quantity will increase.

*Difficulty: Medium*

41. Suppose that supply increases and demand decreases. What effect will this have on price and quantity?
A. Price will increase and quantity may rise or fall.
B. Price will decrease and quantity will increase.
C. Price will decrease and quantity will decrease.
**D.** None of the statements associated with this question are correct.

*Difficulty: Hard*

42. Suppose both supply and demand decrease. What effect will this have on price?
A. It will fall.
B. It will rise.
**C.** It may rise or fall.
D. It will remain the same.

*Difficulty: Hard*

43. The law of demand states that if the price of a good falls and all other things remain the same, the
A. quantity demanded of the good falls.
**B.** quantity demanded of the good rises.
C. demand of the good rises.
D. all of the statements associated with this question are correct.

*Difficulty: Easy*

44. Demand shifters do not include
**A.** the price of the good.
B. the consumer's income.
C. the level of advertising.
D. the price of the other goods.

*Difficulty: Easy*

45. Changes in the price of other goods lead to
A. a change in quantity demanded.
**B.** a change in demand.
C. no change in the demand curve.
D. a movement along the demand curve.

*Difficulty: Easy*

46. Good X is a normal good if an increase in income leads to
A. an increase in the supply for good X.
**B.** an increase in the demand for good X.
C. a decrease in the demand for good X.
D. a decrease in the supply for good X.

*Difficulty: Easy*

47. Which of the following is least likely to be a normal good?
A. Steak.
B. Airline travel.
**C.** Bologna.
D. A house.

*Difficulty: Easy*

48. Suppose good X is a normal good. Then a decrease in income would lead to
A. an outward shift of the demand curve.
**B.** an inward shift of the demand curve.
C. no shift of the demand curve.
D. a movement along the demand curve.

*Difficulty: Easy*

49. An inferior good is a good
A. that has low quality.
**B.** that consumers purchase less of when their incomes are higher.
C. that consumers purchase more when their incomes are higher.
D. of high quality.

*Difficulty: Easy*

50. Suppose that good X is a substitute for good Y. Then an increase in the price of good Y leads to
**A.** an increase in the demand of good X.
B. a decrease in the demand of good X.
C. a decrease in the supply of good X.
D. an increase in the supply of good X.

*Difficulty: Medium*

51. Which of the following are least likely to be substitutes?
A. Chicken and beef.
B. Cars and trucks.
C. Automobile and housing.
**D.** Automobile and gasoline.

*Difficulty: Easy*

52. Good Y is a complement to good X if an increase in the price of good Y leads to
A. an increase in the demand for good X.
B. an increase in the supply for good X.
**C.** a decrease in the demand for good X.
D. a decrease in the supply for good X.

*Difficulty: Medium*

53. Which of the following are least likely to be complements?
A. Peanut butter and jelly.
B. Bread and butter.
C. Sports coats and dress slacks.
**D.** Cars and trucks.

*Difficulty: Medium*

54. Firms advertise in order to cause the demand for their products to
**A.** shift to the right.
B. shift to the left.
C. remain unchanged.
D. all of the statements associated with this question are correct.

*Difficulty: Easy*

55. Advertising provides consumers with information about the underlying existence or quality of a product. These types of advertising messages are called
A. persuasive advertising.
**B.** informative advertising.
C. green advertising.
D. influential advertising.

*Difficulty: Easy*

56. Advertising can influence demand by altering tastes of consumers. This type of advertising is known as
**A.** persuasive advertising.
B. informative advertising.
C. strategic advertising.
D. influential advertising.

*Difficulty: Easy*

57. Which of the following statements is incorrect?
A. As the population rises, the market demand curve shifts to the right.
B. As a greater fraction of the population becomes elderly, the demand for medical services will tend to increase.
C. Changes in the composition of the population affect the demand for a product.
**D.** none of the statements associated with this question are incorrect.

*Difficulty: Medium*

58. If consumers expect future prices to be higher
A. they substitute current purchases for future purchases of perishable products.
**B.** stockpiling will happen when products are durable in nature.
C. the position of the demand will not change.
D. the demand for automobiles today will not change.

*Difficulty: Medium*

59. The demand function
A. describes how much of good X will be purchased at the alternative price of good X, given all the other variables being constant.
**B.** recognizes that the quantity of a good consumed depends on its price and demand shifters.
C. shows the relationship between the quantity demanded of X and variables other than its price.
D. does not include expectations.

*Difficulty: Hard*

60. Which of the following is a linear demand function?
**A.** $Q_x^d = \alpha_0 + \alpha_X P_X + \alpha_Y P_Y + \alpha_M M + \alpha_H H$.
B. $Q_x^d = \alpha P_X^{\alpha X} P_Y^{\alpha Y} M^{\alpha M} H^{\alpha H}$.
C. $Q_x^d = \alpha_0 + \alpha_X P_X^2 + \alpha_Y P_Y^2 + \alpha_M M^2 + \alpha_M H^2$.
D. $Q_x^d = \alpha + \alpha_X \log P_X + \alpha_Y \log P_Y + \alpha_M \log M + \alpha_M \log H$.

*Difficulty: Easy*

61. Good X is a normal good and its demand is given by $Q_x^d = \alpha_0 + \alpha_X P_X + \alpha_Y P_Y + \alpha_M M + \alpha_H H$. Then we know that
A. $\alpha_H > 0$.
B. $\alpha_X > 0$.
C. $\alpha_Y > 0$.
**D.** $\alpha_M > 0$.

*Difficulty: Medium*

62. Suppose X and Y are complements and demand for X is $Q_x^d = \alpha_0 + \alpha_X P_X + \alpha_Y P_Y + \alpha_M M + \alpha_H H$. Then we know
A. $\alpha_H > 0$.
B. $\alpha_X > 0$.
**C.** $\alpha_Y < 0$.
D. $\alpha_M < 0$.

*Difficulty: Medium*

63. Suppose the demand for X is given by $Q_x^d = 100 - 2P_X + 4P_Y + 10M + 2A$, where $P_X$ represents the price of good X, $P_Y$ is the price of good Y, M is income and A is the amount of advertising on good X. Based on this information, we know that good Y is
**A.** a substitute for good X.
B. a complement for good X.
C. an inferior good.
D. a normal good.

*Difficulty: Easy*

64. Suppose the demand for X is given by $Q_x^d = 100 - 2P_X + 4P_Y + 10M + 2A$, where $P_X$ represents the price of good X, $P_Y$ is the price of good Y, M is income and A is the amount of advertising on good X. Based on this information, we know that good X is a
**A.** substitute for good Y and a normal good.
B. complement for good Y and an inferior good.
C. complement for good Y and a normal good.
D. substitute for good Y and an inferior good.

*Difficulty: Medium*

65. Suppose the demand for X is given by $Q_x^d = 100 - 2P_X + 4P_Y + 10M + 2A$, where $P_X$ represents the price of good X, $P_Y$ is the price of good Y, M is income and A is the amount of advertising on good X. If advertising on good X increases by $10,000, then the demand for X will
A. decrease by $20,000.
B. decrease by $100,000.
C. increase by $100,000.
**D.** increase by $20,000.

*Difficulty: Medium*

66. Suppose the demand for X is given by $Q_x^d = 100 - 2P_X + 4P_Y + 10M + 2A$, where $P_X$ represents the price of good X, $P_Y$ is the price of good Y, M is income and A is the amount of advertising on good X. Good X is
A. an inferior good.
**B.** a normal good.
C. a Giffin good.
D. a complement.

*Difficulty: Medium*

67. Consumer surplus is
A. the value consumers get from a supplier.
B. the value consumers do not pay because of a discount by supplier.
**C.** the value consumers get from a good but do not pay for.
D. equal to the amount consumers pay for a good.

*Difficulty: Easy*

68. If the price of good X becomes lower, then the level of consumer surplus becomes
A. lower.
**B.** higher.
C. unchanged.
D. lower in the short-run but higher in the long run.

*Difficulty: Easy*

69. The market supply curve indicates the total quantity all producers in a competitive market would produce at each price,
A. holding only input price fixed.
B. allowing input price to vary.
**C.** holding all supply shifters fixed.
D. allowing all supply shifters to vary.

*Difficulty: Easy*

70. Which of the following is not a supply shifter?
A. Level of technology.
B. Prices of inputs.
**C.** Average income level.
D. Weather.

*Difficulty: Medium*

71. If the price of an input rises, producers are willing to produce
A. more output at each given price.
**B.** less output at each given price.
C. the same output at each given price.
D. none of the statements associated with this question are correct.

*Difficulty: Easy*

72. As additional firms enter an industry, the market supply curve
**A.** shifts to the right.
B. shifts to the left.
C. remains the same.
D. none of the statements associated with this question are correct.

*Difficulty: Easy*

73. An excise tax shifts the supply curve
A. down by the amount of the tax.
**B.** up by the amount of the tax.
C. by rotating it counter-clockwise.
D. by rotating it clockwise.

*Difficulty: Medium*

74. An ad valorem tax shifts the supply curve
A. down by the amount of the tax.
B. up by the amount of the tax.
**C.** by rotating it counter-clockwise.
D. by rotating it clockwise.

*Difficulty: Medium*

75. If firms expect prices to be higher in the future and the product is not perishable, then
**A.** the current supply curve shifts to the left.
B. the current supply curve shifts to the right.
C. producers produce more output to hold back for the future.
D. none of the statements associated with this question are correct.

*Difficulty: Medium*

76. The supply function
A. describes how much of good X will be produced at an alternative price of good X, given all the other variables being constant.
**B.** recognizes that the quantity of a good produced depends on its price and supply shifters.
C. shows the relationship between the quantity supplied of X and variables other than its price.
D. does not include technology.

*Difficulty: Easy*

77. The supply function for good X is given by $Q_x^s = 1{,}000 + P_X - 5P_Y - 2P_W$, where $P_X$ is the price of X, $P_Y$ is the price of good Y and $P_W$ is the price of input W. If the price of input W increases by $10, then the supply of good X
A. will increase by 10 units.
B. will increase by 20 units.
C. will decrease by 10 units.
**D.** none of the statements associated with this question are correct.

*Difficulty: Medium*

78. The supply function for good X is given by $Q_x^s = 1{,}000 + P_X - 5P_Y - 2P_W$, where $P_X$ is the price of X, $P_Y$ is the price of good Y and $P_W$ is the price of input W. If $P_X = 100$, $P_Y = 150$, $P_W = 50$, then the supply curve is
A. $Q_x^s = 550$.
**B.** $Q_x^s = 150 + P_x$.
C. $Q_x^s = 550 + P_x$.
**D.** $Q_x^s = 150 + P_x$.

*Difficulty: Medium*

79. If an excise tax is imposed on a good, then the supply curve
A. shifts up by the amount of the demand elasticity.
B. does not change.
C. shifts down by the amount of the tax.
**D.** shifts up by the amount of the tax.

*Difficulty: Hard*

80. Producer surplus is the
A. area above the supply curve but below the demand curve.
**B.** area above the supply curve but below the market price of the good.
C. minimum amount required by a producer for producing the good.
D. maximum amount a producer can collect from consumers.

*Difficulty: Easy*

81. When quantity demanded exceeds quantity supplied
A. there exists a surplus of a good.
B. the price tends to fall.
**C.** the price is below the equilibrium price.
D. there is no excess demand.

*Difficulty: Medium*

82. Competitive market equilibrium
**A.** is determined by the intersection of the market demand and supply curves.
B. implies that quantity supplied is sufficiently larger than quantity demanded.
C. is determined by the intersection of the excess demand and excess supply curves.
D. implies that quantity demanded is sufficiently larger than quantity supplied.

*Difficulty: Easy*

83. A price ceiling is
A. the minimum legal price that can be charged in a market.
**B.** the maximum legal price that can be charged in a market.
C. above the initial equilibrium price.
D. equal to the initial equilibrium price.

*Difficulty: Easy*

84. Under a price ceiling, the full economic price is
A. the dollar price paid to the firm.
B. the opportunity cost of not being able to buy a good when a consumer needs it.
C. lower than the free-market price.
**D.** higher than the free-market price.

*Difficulty: Medium*

85. When an effective price ceiling is in place
A. every consumer is better off.
B. every consumer is worse off.
**C.** some consumers are better off and others are worse off.
D. on average the net change in consumer surplus is zero.

*Difficulty: Medium*

86. A floor price is
**A.** the minimum legal price that can be charged in a market.
B. the maximum legal price that can be charged in a market.
C. below the initial market equilibrium price.
D. equal to the initial market equilibrium price.

*Difficulty: Easy*

87. The minimum wage
**A.** is an example of floor price.
B. leads to an increase in the number of people employed in unskilled jobs.
C. leads to a decrease in the number of people employed in skilled jobs.
D. causes an increase in social welfare.

*Difficulty: Medium*

88. If demand increases, then the
A. demand curve shifts to the left.
**B.** demand curve shifts to the right.
C. equilibrium price goes down.
D. equilibrium quantity goes down.

*Difficulty: Easy*

89. If supply increases, then the
A. supply curve shifts to the left.
**B.** equilibrium price goes down.
C. equilibrium quantity goes down.
D. demand curve shifts to the right.

*Difficulty: Easy*

90. Producer surplus is measured as the area
A. below the demand curve and above the market price.
B. above the demand curve and below the market price.
**C.** above the supply curve and below the market price.
D. below the supply curve and above the market price.

*Difficulty: Medium*

91. When government imposes a price floor above the market price, the result will be that
**A.** surpluses occur.
B. shortages become a problem.
C. supply and demand will shift up to the new equilibrium.
D. a price floor set above the equilibrium price will have no effect on the market equilibrium.

*Difficulty: Easy*

92. Jane pays the market price of $69 for a new pair of running shoes, even though she would be happy to pay a maximum of $100 for the same pair of shoes. This is an example of the concept of
A. producer surplus.
B. price ceilings.
C. full economic prices.
**D.** consumer surplus.

*Difficulty: Medium*

93. In a competitive market, the market demand is $Q^d = 70 - 3P$ and the market supply is $Q^s = 6P$. A price ceiling of $4 will result in a
A. shortage of 24 units.
**B.** shortage of 34 units.
C. surplus of 58 units.
D. surplus of 34 units.

*Difficulty: Hard*

94. The law of demand indicates that as the price of a good increases, the quantity that
A. producers willing to produce an item increases.
B. producers willing to produce an item decreases.
C. buyers are able to purchase increases.
**D.** buyers are able to purchase decreases.

*Difficulty: Easy*

95. Which of the following is probably not a normal good?
A. Designer jeans.
B. Diamond rings.
**C.** Intercity passenger bus travel.
D. New automobiles.

*Difficulty: Medium*

96. Which of the following pairs of goods are probably complements?
A. Electricity and natural gas.
B. Butter and margarine.
C. Steak and chicken.
**D.** Ketchup and French fries.

*Difficulty: Medium*

97. Graphically, an increase in the number of vegetarians will cause the demand curve for Tofu (a meat substitute) to
**A.** shift rightward.
B. shift leftward.
C. become flatter.
D. become steeper.

*Difficulty: Easy*

98. Suppose the demand for good X is given by $Q^d_x = 20 - 4P_x + 2P_y + M$. The price of good X is $5, the price of good Y is $15, and income is $150. Given these prices and income, how much of good X will be purchased?
A. 160.
**B.** 180.
C. 220.
D. None of the statements associated with this question are correct.

*Difficulty: Medium*

99. For a wood furniture manufacturer, an increase in the cost of lumber will cause the supply curve to:
A. become flatter.
B. become steeper.
**C.** shift to the left.
D. shift to the right.

*Difficulty: Easy*

100. Demand shifters do not include the
**A.** price of the good.
B. consumer's tastes and preferences.
C. the price of the other related goods.
D. consumer's expectations about future prices of the good.

*Difficulty: Easy*

101. Good X is an inferior good if a decrease in income leads to
A. an increase in the supply of good X.
B. a decrease in the supply of good X.
**C.** an increase in the demand for good X.
D. a decrease in the demand for good X.

*Difficulty: Easy*

102. All else held constant, as additional firms enter an industry
**A.** more output is available at each given price.
B. less output is available at each given price.
C. the same output is available at each given price.
D. output could increase or decrease at each given price.

*Difficulty: Medium*

103. An excise tax of $1.00 per gallon of gasoline placed on the suppliers of gasoline, would shift the supply curve
A. down by $1.00.
B. down by more than $1.00.
**C.** up by $1.00.
D. up by less than $1.00.

*Difficulty: Easy*

104. Suppose there is a simultaneous increase in demand and decrease in supply, what effect will this have on the equilibrium price?
**A.** It will rise.
B. It will fall.
C. It may rise or fall.
D. It will remain the same.

*Difficulty: Medium*

105. Given a linear demand function of the form $Q_X^d = 100 - 0.5P_X$, find the inverse linear demand function.
**A.** $P_X = 200 - 2Q_X$.
B. $P_X = 100 - 0.5Q_X$.
C. $P_X = 100 - 2Q_X$.
D. $P_X = 100Q_X - 0.5P_X$.

*Difficulty: Easy*

106. Given a linear demand function of the form $Q_X^d = 500 - 2P_X - 3P_Y + 0.01M$, find the inverse linear demand function assuming M = 20,000 and $P_Y = 10$.
A. $P_X = 500 - 2Q_X - 3P_Y + 0.01M$.
**B.** $P_X = 335 - 0.5Q_X$.
C. $P_X = 335 - 2Q_X$.
D. $P_X = 500 - 2Q_X$.

*Difficulty: Medium*

107. Given a linear supply function of the form $Q_X^S = -10 + 5P_X$, find the inverse linear supply function.
**A.** $P_X = 2 + 0.2Q_X$.
B. $P_X = -10 + 0.2Q_X$.
C. $P_X = -10 + 5Q_X$.
D. $P_X = 2 + 5Q_X$.

*Difficulty: Easy*

108. Given a linear supply function of the form $Q_X^S = 3{,}000 + 3P_X - 2P_r - P_w$, find the inverse linear supply function assuming $P_r = \$1{,}000$ and $P_w = \$100$.
A. $Q_X^S = 900 + 3P_X$.
B. $P_X = 300 + 0.3333Q_X$.
**C.** $P_X = -300 + 0.3333Q_X$.
D. $P_X = 2{,}900 + 3P_X$.

*Difficulty: Medium*

109. Suppose the market demand for good X is given by $Q_X^d = 20 – 2P_X$. If the equilibrium price of X is $5 per unit then consumer surplus is
A. $100.
B. $75.
C. $50.
**D.** $25.

*Difficulty: Easy*

110. Suppose the market demand for good X is given by $Q_X^d = 20 - 2P_X$. If the equilibrium price of X is $5 per unit, then the total value a consumer receives from consuming the equilibrium quantity is
A. $100.
**B.** $75.
C. $50.
D. $25.

*Difficulty: Medium*

111. Suppose the market demand for good X is given by $Q_X^d = 20 - 2P_X$. If the equilibrium price of X is $5 per unit then consumers' expenditure on X is
A. $5.
B. $25.
**C.** $50.
D. cannot be determined from the information contained in the question.

*Difficulty: Easy*

112. Suppose the market supply for good X is given by $Q_X^S = -100 + 5P_X$. If the equilibrium price of X is $100 per unit then producer surplus is
**A.** $400.
B. $1,600.
C. $16,000.
D. none of the statements associated with this question are correct.

*Difficulty: Easy*

113. Suppose the market supply for good X is given by $Q_X^S = -100 + 5P_X$. If the equilibrium price of X is $100 per unit then producers' revenue from X is
A. $100.
B. $20,000.
C. $40,000.
**D.** cannot be determined from the information contained in the question.

*Difficulty: Medium*

114. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. Compute the surplus received by consumers and producers.
A. $24 and $24, respectively.
**B.** $4 and $4, respectively.
C. $2 and $6, respectively.
D. $6 and $2, respectively.

*Difficulty: Medium*

115. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. Compute the equilibrium price and quantity in this market.
A. $24 and 24 units, respectively.
B. $4 and 4 units, respectively.
C. $2 and 6 units, respectively.
**D.** $6 and 2 units, respectively.

*Difficulty: Easy*

116. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. Compute the number of units and the price at which those units will be exchanged when there is an $8 per unit price floor.
**A.** 1 unit and $6 per unit.
B. 1 unit and $8 per unit.
C. 3 units and $6 per unit.
D. 3 units and $8 per unit.

*Difficulty: Medium*

117. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. An $8 per unit price floor will result in a
A. shortage of 1 unit.
**B.** surplus of 2 units.
C. shortage of 3 units.
D. surplus of 3 units.

*Difficulty: Medium*

118. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. Compute the surplus consumers receive when an $8 per unit price floor is imposed on the market.
A. $0.
**B.** $1.
C. $3.
D. $5.

*Difficulty: Medium*

119. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. Compute the surplus producers receive when an $8 per unit price floor is imposed on the market.
A. $1.
B. $2.
C. $32.
**D.** $33.

*Difficulty: Hard*

120. Consider a market characterized by the following inverse demand and supply functions: $P_X = 10 - 2Q_X$ and $P_X = 2 + 2Q_X$. Compute the loss in social welfare when an $8 per unit price floor is imposed on the market.
A. $0.
**B.** $1.
C. $2.
D. $3.

*Difficulty: Hard*

121. The seller side of the market is known as the:
A. income side.
B. demand side.
**C.** supply side.
D. seller side.

*Difficulty: Easy*

122. Suppose both supply and demand increase. What effect will this have on the equilibrium price?
A. it will fall.
B. it will rise.
**C.** it may rise or fall.
D. it will remain the same.

*Difficulty: Hard*

123. Suppose both supply and demand increase. What effect will this have on the equilibrium quantity?
A. it will fall.
**B.** it will rise.
C. it may rise or fall.
D. it will remain the same.

*Difficulty: Hard*

124. Suppose supply decreases and demand increases. What effect will this have on the price?
A. it will fall.
**B.** it will rise.
C. it may rise or fall.
D. it will remain the same.

*Difficulty: Hard*

125. Suppose supply decreases and demand increases. What effect will this have on the quantity?
A. it will fall.
B. it will rise.
**C.** it may rise or fall.
D. it will remain the same.

*Difficulty: Hard*

126. In a competitive market, the market demand is $Q^d = 60 - 6P$ and the market supply is $Q^s = 4P$. A price floor of $9 will result in a
A. shortage of 30 units.
B. shortage of 12 units.
**C.** surplus of 30 units.
D. surplus of 12 units.

*Difficulty: Medium*

127. Other things held constant, the lower the price of a good
A. the lower the demand.
B. the higher the demand.
**C.** the greater the consumer surplus.
D. the lower the consumer surplus.

*Difficulty: Medium*

128. Other things held constant, the higher the price of a good
A. the lower the producer surplus.
**B.** the greater the producer surplus.
C. the higher the supply.
D. the lower the supply.

*Difficulty: Medium*

129. Other things held constant, the lower the price of a good
**A.** the lower the producer surplus.
B. the greater the producer surplus.
C. the higher the supply.
D. the lower the supply.

*Difficulty: Medium*

130. If A and B are substitute goods, an increase in the price of good A would:
A. have no effect on the quantity demanded of B.
**B.** lead to an increase in demand for B.
C. lead to a decrease in demand for B.
D. none of the statements associated with this question are correct.

*Difficulty: Medium*

131. If A and B are substitute goods, a decrease in the price of good A would:
A. have no effect on the quantity demanded of B.
B. lead to an increase in demand for B.
**C.** lead to a decrease in demand for B.
D. none of the statements associated with this question are correct.

*Difficulty: Medium*

132. If A and B are complementary goods, a decrease in the price of good A would:
A. have no effect on the quantity demanded of B.
**B.** lead to an increase in demand for B.
C. lead to a decrease in demand for B.
D. none of the statements associated with this question are correct.

*Difficulty: Medium*

133. An excise tax of $1.00 per gallon of gasoline placed on the suppliers of gasoline in a market with downward sloping demand and upward sloping supply would raise the equilibrium price
A. exactly $1.00 per gallon.
B. by less than $1.00 per gallon.
**C.** by more than $1.00 per gallon.
D. too little information to determine the impact on the equilibrium price.

*Difficulty: Hard*

134. Consider a market characterized by the following demand and supply conditions: $P_X = 15 - 2Q_X$ and $P_X = 3 + 2Q_X$. The equilibrium price and quantity are, respectively,
A. $3 and 9 units.
**B.** $9 and 3 units.
C. $12 and 4 units.
D. $4 and 12 units.

*Difficulty: Medium*

135. Consider a market characterized by the following demand and supply conditions: $P_X = 50 - 5Q_X$ and $P_X = 32 + Q_X$. The equilibrium price and quantity are, respectively,
**A.** $35 and 3 units.
B. $3 and 35 units.
C. $82 and 50 units.
D. $20 and 6 units.

*Difficulty: Medium*

**Essay Questions**

136. When Iraq invaded Kuwait, the market price of crude petroleum jumped from $21.54 per barrel to $30.50 per barrel - an increase of almost 42 percent. Your boss is puzzled, because the price increase actually occurred before there was a physical reduction in the current amount of oil available for sale.
a. Explain why the price of oil increased so rapidly.
b. One year after the invasion, the price of oil fell to $21.32 per barrel, its prewar level. Explain why.

a. The invasion of Iraq led many to believe that an all-out war in the Middle East was very likely. Expectations changed, because if an all-out war did break out the supply of oil would be drastically reduced, raising the equilibrium price. Because of the likelihood of a future rise in the price of oil (if an all-out war were to occur), many producers chose to hold back their supply of oil on the day of the invasion in order to have more to sell in the event of a war. The impact of the invasion on the market for oil was to decrease the willingness of producers to sell oil at the old price, or in economic terms, a decrease in the supply of oil. Similarly, refineries that buy crude oil to convert into gasoline suddenly desired to buy more oil that day, in order to avoid the higher prices they would have to pay for the input (oil) in the event of an all-out war. This had the effect of increasing the demand for crude oil on the day of the invasion. The end result of these two shifts was a substantial increase in the price of oil, and roughly no change in the total amount of oil sold on the market.
b. In the end, there was no all-out war, and the demand and supply curves shifted back to their initial positions. Consequently, the price of oil one year after the invasion was roughly the same as it was immediately prior to the invasion.

137. Caviar and champagne are complements. Recently pollution has been a problem in the Volga River, where much of the world's caviar originates. The sturgeon that live in these waters are laying fewer eggs than before. Show graphically and explain the effects on the market for caviar and the market for champagne.

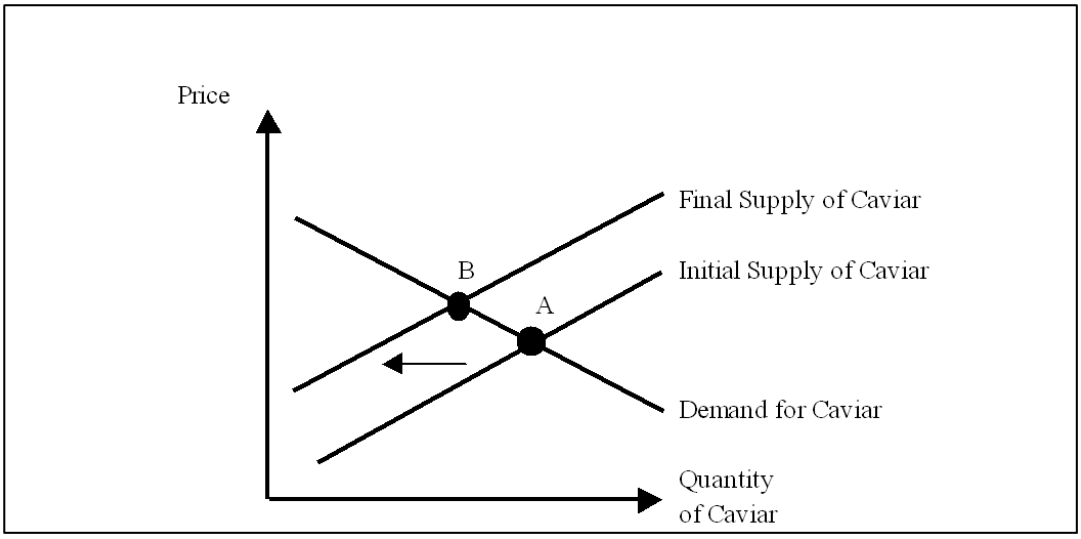



Figure 2-2(a)
The pollution problem shifts the supply of caviar to the left and results in an increase in the equilibrium price and a decrease in the quantity of caviar sold. This is shown as the movement from A to B in Figure 2-2(a).

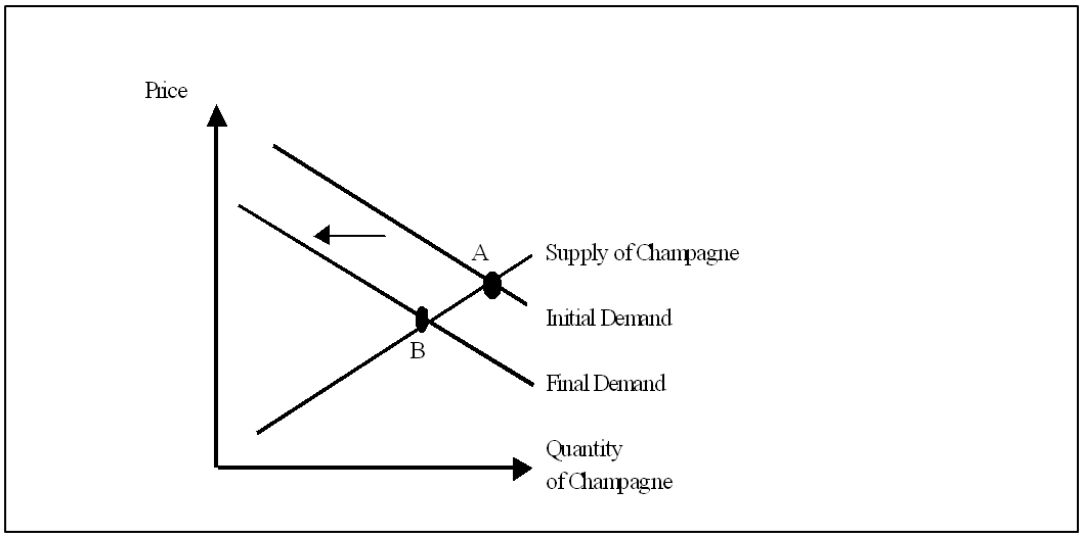
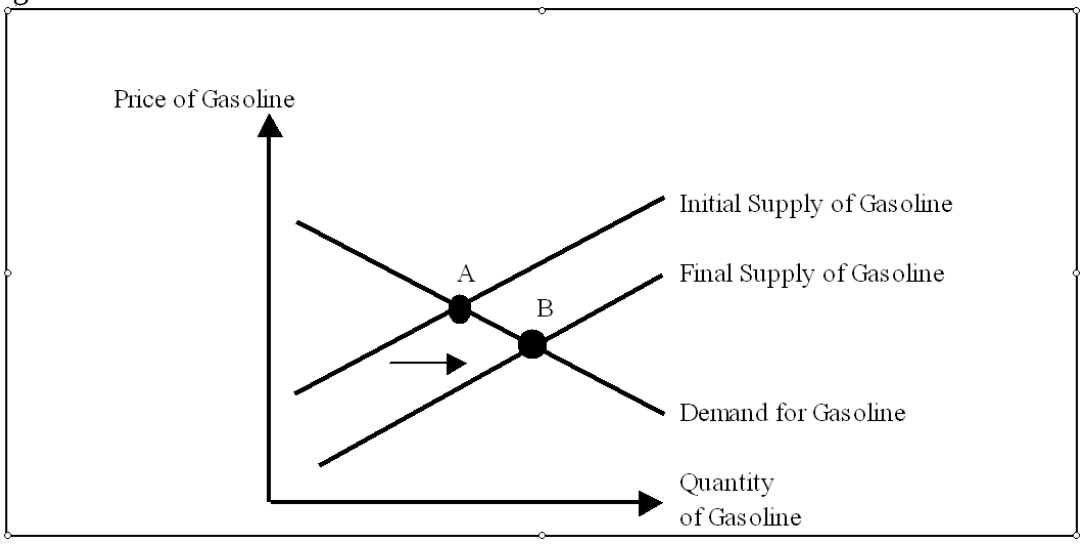



Figure 2-2(b)
An increase in the price of caviar decreases the demand for champagne since they are complements. This results in a reduction in both the equilibrium price and quantity of champagne sold as shown by the movement from A to B in Figure 2-2(b).

138. In the early part of 1998, crude oil prices fell to a nine-year low at $13.28 a barrel. Falling crude oil prices were due in part to technological advances that made locating reservoirs and extraction cheaper. What impact will these lower crude oil prices have on the price of gasoline?

Since crude oil is an input to producing gasoline, lower crude prices will reduce the cost of producing gasoline. Gasoline producers will now be willing to produce more gas at any given price. That is, the supply curve will shift to the right. The equilibrium price and quantity combination moves from point A to point B in Figure 2-3: The equilibrium price of gasoline falls, while the equilibrium quantity rises.

Figure 2-3



139. You are an aide for the Senate Banking Committee Chairman. He comes to you with a bill that proposes setting limits on what ATM owners can charge nonaccount holders, over and above what banks charge their own customers. Currently, large banks charge noncustomers an average fee of $1.35 per transaction in addition to the fees the customer's own bank imposes. The Senator asks you to look at a proposal that would place a $0.50 cap on the fees ATM owners can charge noncustomer for accessing their money. If this legislation is enacted, what would be the likely effects?

The proposal is, in essence, an effective price ceiling of $.50. As shown in Figure 2-4, this will create a shortage of ATMs. The amount of the shortage will equal the difference between the quantity demanded and the quantity supplied at the price ceiling, i.e., the difference between points A and B. Longer lines are likely to develop at ATM machines. Including the value of lost time, the full economic price paid for ATM usage will exceed the current price of $1.35 per transaction. The full economic price is denoted P* in Figure 2-4. Note that the actual magnitude of the shortage and full economic price will depend on the relative slopes of the demand and supply curves.

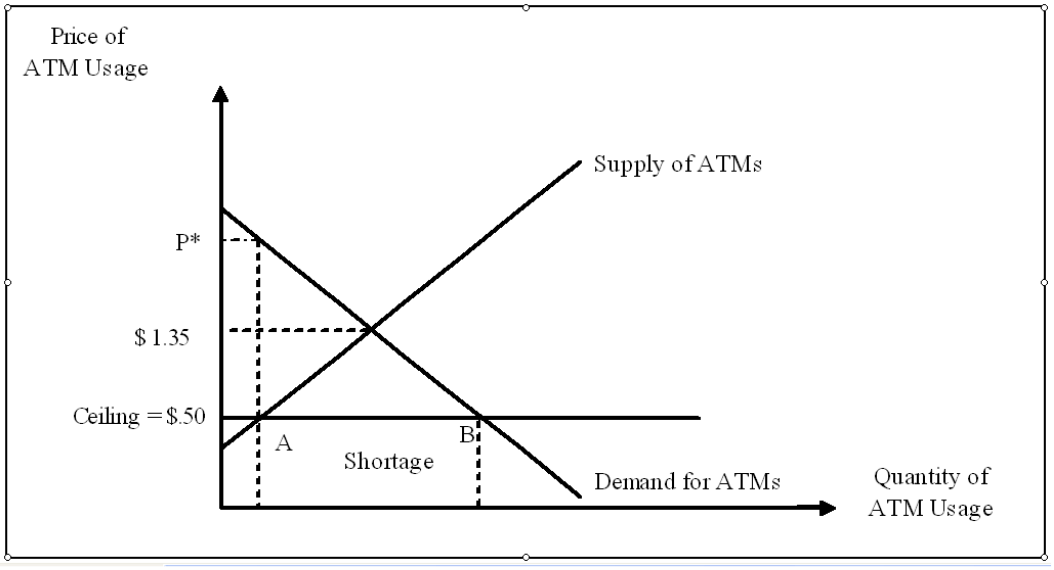



Figure 2-4

140. Apples and oranges are substitutes. A freeze in Florida destroys most of the orange crop. What would you expect to happen to the market for the following:
a. Oranges?
b. Apples?
c. Orange juice?

a. The demand for oranges does not change, but supply shifts left. This implies an increase in price and a decrease in quantity sold in the orange market.
b. Since apples are a substitute for oranges, an increase in the price of oranges increases the demand for apples. As the supply of apples does not change, this implies an increase in both price and quantity sold in the apple market.
c. Oranges are the main input for the production of orange juice. An increase in the price of oranges decreases the supply curve for orange juice. On the other hand, the demand does not change. This results in an increase in price and a decrease in quantity sold in the orange juice market.

141. In 1987 a 386 PC sold at a price of $6,995. Five years later, you could purchase essentially the same computer for $1,495. Today, you can purchase a faster Pentium for a fraction of the initial price of a slower 386 PC.
a. Why have computer prices fallen so dramatically?
b. What impact, if any, do you think the growing use of the Internet will have on the price of computers?

a. When the PC with a 386 chip was initially introduced, there were relatively few firms producing a PC with a 386 chip. Since then, literally hundreds of firms have entered the market for PCs, shifting the supply of computers to the right. Furthermore, advances in technology make it possible to produce more chips per die, and improvements in clean rooms have reduced the number of computer chips that are discarded during production due to defects. Such improvements have shifted the supply curve even further to the right. The end result, as we all know, is that personal computers are much cheaper today, and more people use PC's than ever before.
b. Since the Internet, Prodigy, and CompuServe are complements for computers, their growing use (due to lower prices for the services) will tend to shift the demand curve for computers to the right. This will put upward pressure on computer prices, offsetting to some extent the price declines brought on by supply enhancing technological advances.

142. American Tennishoe, Inc., is concerned because Congress has proposed an excise tax of $1 on each pair of tennis shoes sold in the United States. They are lobbying against the tax through an advertising campaign that says the tax will raise the price of tennis shoes by $1. Use supply and demand graphs to show how much of the tax will actually be passed on to consumers.

Suppose shoe producers are responsible for paying the tax to the government. Then the $1 tax shifts the market supply curve upward by $1 for each quantity of shoes. This results in an increase in price from P1 to P2 and a decrease in quantity from Q1 to Q2 in Figure 2-7. Notice that the price goes up by less than the $1 tax.

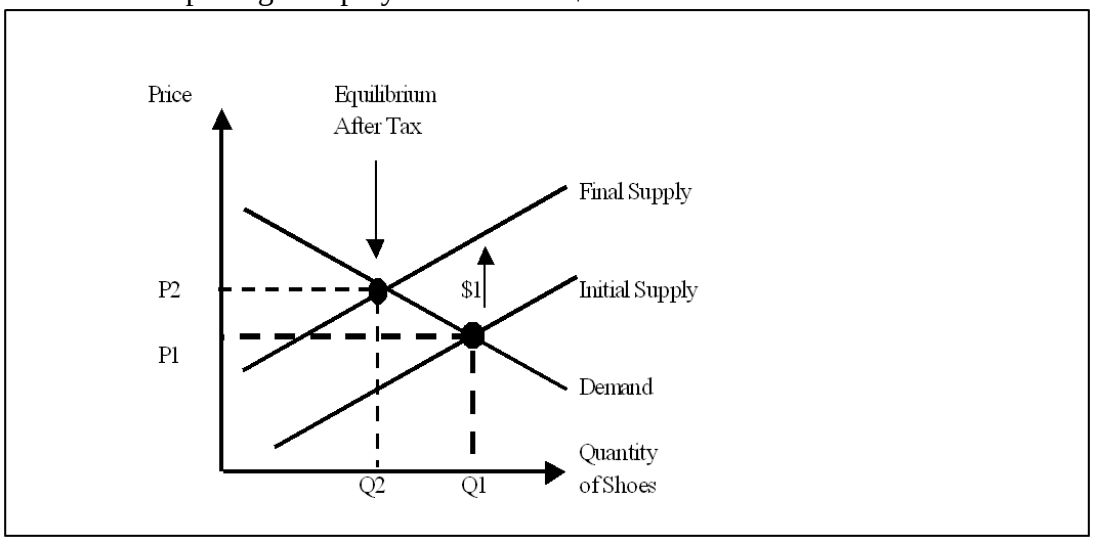



Figure 2-7

143. RB, Inc., is a wholesaler specializing in dry foods, such as rice and dry beans. Its manager is troubled by a recent article in *The Wall Street Journal* that say a recession in imminent and that income will fall by 3 percent over the next year. What do you think is likely to happen to the price of the products RB, Inc., sells? Why?

Beans and rice are probably inferior goods. If so, a reduction in income shifts demand for these goods to the right. Consequently, the ultimate impact of the recession will be to raise the price of goods sold by RB, Inc. and more beans and rice will be sold than before.

144. Consider the market for two goods that are substitutes, such as pens and pencils. If a technological breakthrough reduced the cost of producing pens:
a. What would happen to the supply of pens?
b. What would happen to the price of pens and the quantity exchanged?
c. What effect would this change in the price of pens have on the market for pencils?

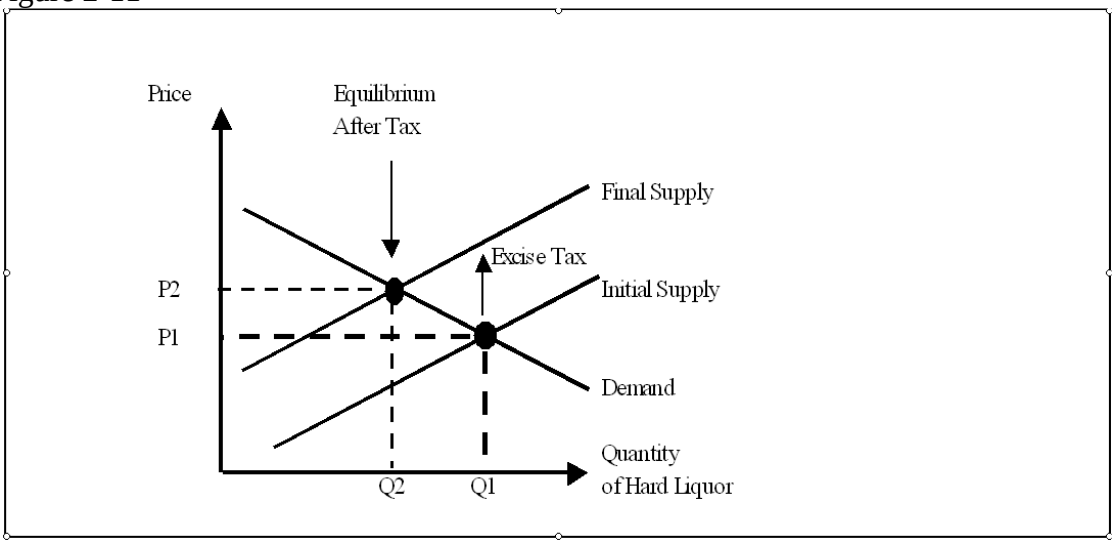
a. The cost of producing pens will be reduced for each quantity of output, which will lead to an increase in the supply of pens.
b. Price will be reduced while quantity exchanged will increase.
c. A reduction in the price of pens reduces the demand for pencils. The price and quantity sold in the market for pencils will both decrease.

145. Russian state television has imposed a temporary ban on all TV commercials. Your firm specializes in exports to Russia. 90 percent of it sales consist of consumer goods shipped to Russia. Your supervisor wants to know the likely impact of the ban on your firm's operations. What do you tell her?

A ban on advertising will likely reduce the demand for your firm's product, resulting ultimately in a lower price and quantity sold.

146. The federal government recently decided to raise the excise tax on hard liquor.
a. Graphically illustrate the effects of this tax on the market for hard liquor.
b. Would a $1 increase in the excise tax on liquor increase the equilibrium price of liquor by $1? Explain.
c. How would the excise tax on hard liquor affect a beer distributor?

a. As can be seen from Figure 2-11, the market supply for hard liquor will decrease by the amount of the excise tax. This results in higher prices (from P1 to P2) and smaller quantities sold in the market for hard liquor (from Q1 to Q2).
Figure 2-11




b. No, a $1 increase in the excise tax on liquor shifts the initial supply up (leftward) by $1. This reduces the equilibrium quantity exchanged in the market. While the equilibrium price increases to P2 (which is less than the P1 plus the excise tax), it must pay Uncle Sam $1 (the difference between the initial and final supply curve). The firm ends up keeping the price associated with Q2 on the initial supply curve, which is less than the initial equilibrium price, P1. Alternatively, note that adding a $1 excise tax to the initial equilibrium price P1, is greater than the post-tax equilibrium price, P2.
c. Since hard liquor and beer are substitutes in consumption, an increase in price in hard liquor shifts the demand curve for beer to the right. Hence, both the equilibrium price and quantity of beer will increase. Anticipating this, a beer distributor should increase its production.

147. Estimates suggest that the North American Free Trade Agreement (NAFTA) will ultimately result in tariff cuts averaging 38 percent globally. Assuming these estimates are correct, would you expect the price of the average imported goods to fall by 38 percent? Explain.

A tariff reduction can be viewed as a reduction in a tax on suppliers, which shifts the supply curve for the affected product to the right. If tariffs decline by an average of 38 percent, one would expect prices to fall due to the increase in supply the tax reduction brings forth. However, only if demand is perfectly inelastic will the entire tax (tariff) reduction be passed on to consumers in the form of a 38 percent price decline.

148. The government decides that a specific scarce good should be provided for everyone who wants it at a price of zero and passes a law making it illegal to buy or sell the good. However, people can give the good away. This good is highly desirable for some of the population. What effect will this law have on the market? What would happen in this market if the law were removed?

The new legislation is essentially a price ceiling. This price ceiling will have two effects. First it will result in a shortage in the market since quantity demanded will now exceed quantity supplied. This shortage will be accompanied by a full economic price that is greater than the previous equilibrium price. The second effect will be the emergence of a black market, where the good will be traded illegally. Since there exists a positive cost associated with possibly being caught selling the good, the black market price will be higher than the previous equilibrium price.
If the law were removed, the full economic price would decrease and the equilibrium quantity would increase. Also, the black market would disappear.

149. You are the manager of a car dealership that sells luxury automobiles, which are normal goods. Although a recession is expected next year, you expect your clients' incomes to increase over the coming year. What will you do about ordering cars for next year as compared to last year? Why?

Since the income of your clients is expected to rise, demand is expected to increase. Hence, you should order more cars in the coming year as compared to last year's order.

150. You are the manager of Fast & Easy Donuts. Almost all of your donut sales are derived from the drive-through window. You know from experience that coffee is a complement for your donuts. The morning newspaper says that a major storm has just destroyed 50 percent of this year's coffee bean crop. Will this affect how much flour you order? Will it affect how many employees you schedule? What will happen to prices?

Destruction of 50% of this year's coffee bean crop means a decrease in the supply curve of coffee. The equilibrium price and quantity in the market for coffee is higher and lower, respectively. As the price of a coffee increases, the demand curve for its complement, donuts, decreases. Hence, quantities sold in the donut market will be lowered. You should order less flour. Also, you should hire fewer employees since prices and quantity sold are expected to be lower.

151. You are an economic advisor to the Treasurer of the United States. Congress is considering increasing the sales tax on gasoline by $.03 per gallon. Last year motorists purchased 10 million gallons of gas per month. The demand curve is such that every $.01 increase in price decreases sales by 100,000 gallons per month. You also know that for every $.01 increase in price, producers are willing to provide 50,000 more gallons of gasoline to the market. The legislature has stated that the $.03 tax will increase government revenues by $300,000 per month and raise the price of gasoline by $.03 per gallon. Is this correct?

Given the information, the supply and demand curves can be described as follows:
$Q^s = 10{,}000{,}000 + 5{,}000{,}000(p^s - p^0)$
$Q^d = 10{,}000{,}000 - 10{,}000{,}000(p^d - p^0)$,
where $p^0$ is the initial price and the quantity of goods is in millions of units. With an excise tax of $.03, the price paid by a consumer is greater than the price received by a producer by $.03. That is, $p^d = p^s + .03$. If we substitute this in for $p^d$ in the demand function we obtain $p^s - p^0 = -\$.02$ and $Q^s = Q^d = 9.9$ million. The total tax revenue is 9.9 million gallons x $.03/gallon = $297,000 (per month). The new price paid by consumers is $p^d = p^s + \$.03 = p^0 - \$.02 + \$.03 = p^0 + \$.01$. Hence, the price will rise by only $.01, instead of $.03.

152. Suppose you are an aide to a U.S. Senator who is concerned about the impact of a recently proposed excise tax on the welfare of her constituents. You explained to the Senator that one way of measuring the impact on her constituents is to determine how the tax change affects the level of consumer surplus enjoyed by the constituents. Based on your arguments, you are given the go-ahead to conduct a formal analysis, and obtain the following estimates of demand and supply: $Q^d = 500 - 5P$ and $Q^S = 2P - 60$.
a. Graph the supply and demand curves.
b. What are the equilibrium quantity and equilibrium price?
c. How much consumer surplus exists in this market?
d. If a $2 excise tax is levied on this good, what will happen to the equilibrium price and quantity?
e. What will the consumer surplus be after the tax?

a. See Figure 2-17.

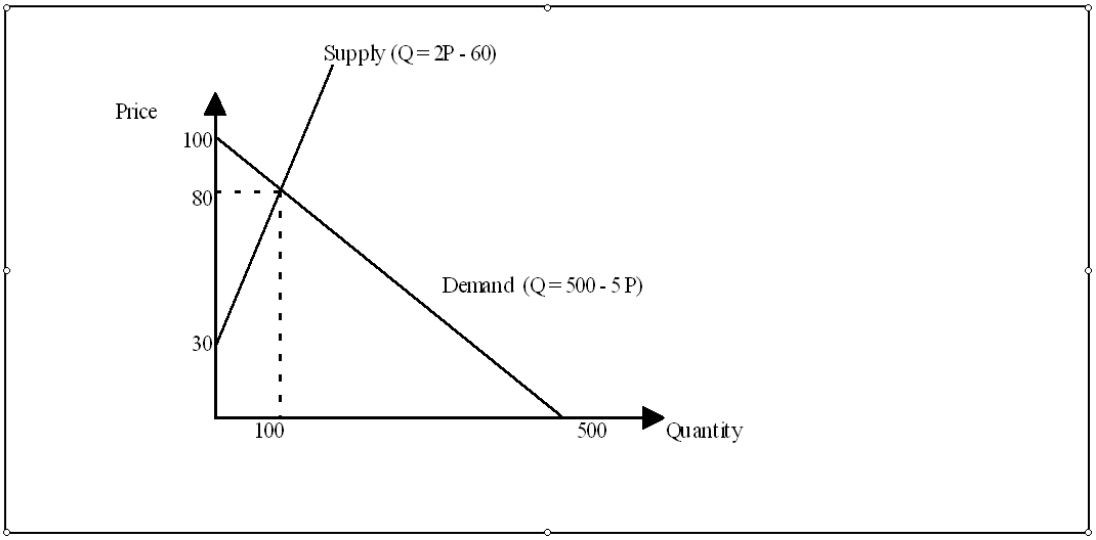



Figure 2-17
b. Equilibrium quantity and price are 100 units and $80, respectively.
c. Consumer surplus = 1/2(100 - 80) x (100) = $1,000.
d. Note that before the excise tax, the inverse supply function is $P = 30 + .5Q^s$. A $2 excise tax shifts the inverse supply function up by the amount of the tax, so the inverse supply function after a $2 excise tax must be $P = 32 + .5\ Q^s$. This means that the supply function after the tax is $Q^s = 2P - 64$ (Note that this expression is equivalent to $Q^s = 2\ (P-2) - 60$, since the producer must pay $2 to the government for each unit sold). The demand function remains unchanged at $Q^d = 500 - 5P$. Setting $Q^s = Q^d$ and solving for price, we obtain P = $80.57. Plug this price into either the demand or supply function yields the equilibrium quantity, Q = 97.14.
e. Consumer surplus (post tax) = 1/2(100 - 80.57) x (97.14) = $943.72.

153. The demand for your product has been estimated to be $Q_x^d = 7{,}880 - 4P_x - 2P_y + P_z - .1M$. The relevant price and income data are as follows: $P_x = 10$, $P_y = 15$, $P_z = 50$, $M = 40{,}000$.

a. Which goods are substitutes for X? Which are complements?
b. Is X an inferior or a normal good?
c. How much X will be purchased?
d. Graph the demand curve for X given the above information.
e. How will the demand curve change if M falls to 35,000?

a. Z is a substitute for X, while Y is a complement for X.
b. X is an inferior good.
c. $Q_x^d = 7{,}880 - 4(10) - 2(15) + 50 - 0.1(40{,}000) = 3{,}860$.
d. See Figure 2-18.

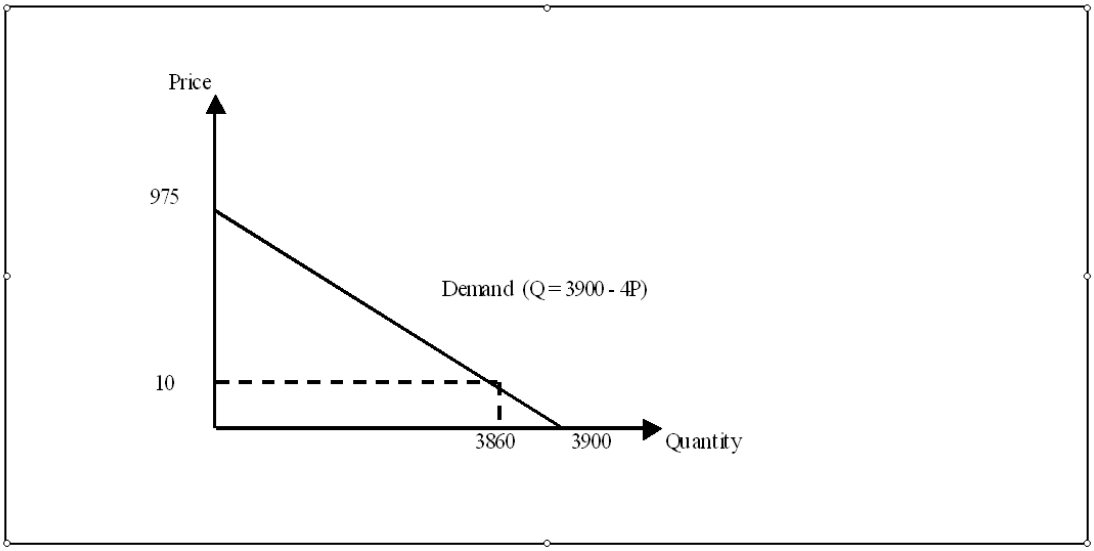


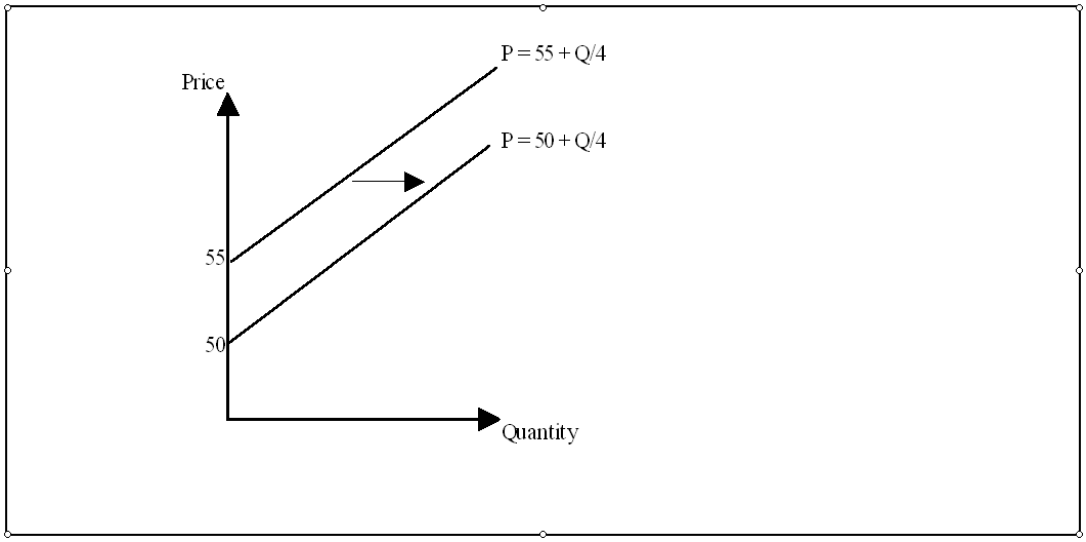

Figure 2-18

154. Suppose the supply curve for a product is given by

$Q_x^S = -300 + 4P_x + 2P_z$ and $P_x = 30$, $P_z = 40$.

a. How much X is produced?
b. What is the inverse supply curve for X given the above information?
c. Graph this supply curve.
d. Show what happens to this supply curve if the price of Z goes up by $10.

a. $Q^s_x$ = -300 + 4(30) + 2(40) = -100. Since negative output is impossible, quantity supplied is zero.
b. The inverse supply function is P = 55 + Q/4.
c. See Figure 2-19.
Figure 2-19




d. After a change in the price of Z, the inverse supply function becomes P = 50 + Q/4, as shown in Figure 2-19. That is, for every price, the quantity supplied will increase by 20 units compared with the initial case.

155. Recently, the Brazilian Association of Citrus Exports (Abecitrus) announced that orange production would be down 25 percent this year because of poor weather conditions, disease, and tree stress resulting from three straight bumper crops. What effect will the decreased production of oranges have on the demand for tomato juice?

A 25% reduction in the production of oranges shifts the supply curve for oranges leftward, raising orange prices and decreasing the quantity demanded. Since oranges are inputs in production for orange juice, an increase in orange prices, decreases the supply curve for orange juice, which causes orange juice prices to increase and the quantity demanded to decrease. Assuming orange juice and tomato juice are substitutes in consumption, higher orange juice prices cause consumers to switch from drinking orange juice to tomato juice. Thus, demand for tomato juice increases.