

1. B The equilibrium point is located at the intersection of the market supply and demand curves. At this point, the quantity supplied must equal the quantity demanded; thus, to find the market equilibrium price, one must set Q_D equal to Q_S and solve for P. In this case, the equilibrium price is \$20. Since the market price is higher than the equilibrium price, there will be more suppliers who want to sell the good than there are consumers who want to buy it. [15,2,6; 18,2,2; 18,1,1]
2. B Aggregate demand—which consists of consumption, investment, government purchases, and net exports—determines an economy's short-run output. [101,1,3]
3. A Created by economist Arthur Okun, Okun's Law holds that a one percent deviation in the unemployment rate from the natural rate of unemployment corresponds to a two percent deviation in the output gap. [100,1,0]
4. D In a closed economy, national savings is equal to the sum of private savings—Gross Domestic Product minus consumer spending and taxes—and government saving—net taxes minus government spending. In this example, private savings is equal to \$25 billion; thus, government saving is equal to -\$5 billion, meaning that the government is running a \$5 billion deficit. When governments run deficits, they crowd out investment and in turn reduce the growth of living standards. [83,1,5; 83,2,1]
5. D A rational economic actor makes decisions to maximize the benefits they receive, which economists define broadly. Supporting social issues, for instance, may be important to someone, and so acting in line with that value is entirely rational. [7,2,0]
6. E The political and legal environment in which economic actors operate can massively influence labor productivity and overall standard of living. Specifically, strong economies tend to have political and legal systems that allow manufacturers to take advantage of modern manufacturing techniques. [80,2,1]
7. C Gross Domestic Product for a specific time period only includes goods produced during that time period. Thus, the resale of a used motorcycle produced in a prior year does not contribute to Gross Domestic Product. [70,1,2]
8. E Increasing aggregate demand will shift the curve to the right, placing the new equilibrium point below and to the right of the previous equilibrium. Consequently, output increases while the price level falls. [104,2,3; 104,2,4]
9. B Acequias are water allocation systems historically used in the western part of the United States. They helped distribute limited water resources. [118,2,1]
10. A The Latin phrase “per capita”—as used in expressions like Gross Domestic Product (GDP) per capita—directly translates to “per head.” [62,1,1]
11. B If it is more difficult for suppliers to enter the market for pickup trucks, supply will become less elastic. This reduction in elasticity is reflected in a supply curve that becomes more vertical. [26,1,6; 26,2,3]
12. B Arthur Okun, a chief economic advisor for President Kennedy, noticed a relationship between the output gap and cyclical unemployment. This principle, now named Okun's Law, holds that a one percent deviation in the unemployment rate from the natural rate of unemployment corresponds to a two percent deviation in the output gap. [99,2,3]
13. A When total surplus—the sum of consumer surplus and producer surplus—is maximized, then an economic outcome is Pareto efficient. [20,2,3]
14. A If the market price for a good or service is greater than the equilibrium price, more suppliers will want to supply the good than consumers who want to consume it, resulting in excess supply. [18,1,1]
15. C When the Smith household shifts consumption toward a cheaper good, they can maintain the same level of well-being without having to pay more. This substitution effect helps explain why the Consumer Price Index overstates the true increase in the cost of living. [73,2,2; 74,1,0]
16. A Fiscal policy—which includes changes to the tax rates and changes to government spending—is one tool governments can use to stabilize or stimulate the economy during recessions. Specifically, increased government spending is an example of expansionary fiscal policy. [108,2,1; 108,2,2]
17. A The law of demand outlines an inverse relationship between a good's price and the quantity of it that consumers demand. Increasing the price of peaches would therefore lower the quantity of peaches that consumers demand. [12,2,1]
18. B Water property rights have failed to protect ecosystems because they are difficult to define. [120,3,1]
19. A Structural unemployment occurs when there is a mismatch between a worker's skills and the skills demanded in the economy. Because there are too few foxes in the area, his fox fur skills are not in demand, and thus he is experiencing structural unemployment. [76,2,1]
20. A Positive economic statements are value free and can describe economic phenomena like the tendency for firms to lay off workers in recessions. [8,1,1]
21. B The formal study of economics has examined how societies convert resources into desirable goods and services for over 200 years. [5,1,1]
22. E If water sellers can export water to users willing to pay a higher price, local users will consume less water, but their demand for water remains unchanged. [122,1,2]

23. B Water is an ecosystem service when it provides a service that would otherwise require capital investment. A stream removing pollutants from the environment fulfills this example. [111,2,1]
24. B Approximately 10% of India's Gross Domestic Product is produced by groundwater irrigation. This growth was permitted by generous energy subsidies. [116,3,2]
25. B Because Iman did not work during the past week and has not made an effort to find a job for more than the past month, she is out of the labor force. [75,1,1]
26. A Pepsi and Coca-Cola are substitutes. An increase in the price of Pepsi will lead some consumers to switch to Coca-Cola, increasing the demand for Coca-Cola. [13,2,6]
27. B Decreasing block rate systems are a type of rate schedule that charge less money as consumers use more water. [115,2,1]
28. A Water is classified according to its source. It can be either ground- or surface water. [112,2,1]
29. C During the early 1900s, Spring Valley Water Works was the sole supplier of water in San Francisco due to economies of scale, making it a natural monopoly. [44,1,1; 115,1,1]
30. D The four main categories of economic water users are agricultural, urban, industrial, and environmental, the latter of which is gaining interest after traditionally being considered less important. [112,1,2]
31. C Government purchases is one of the four categories of expenditures that make up Gross Domestic Product. Interest paid on government debt does not, however, contribute to government purchases. [71,2,2]
32. B Sprinklers are between 10 and 35 percent more efficient than gravity or flood irrigation. [119,1,1]
33. D About 70% of global irrigated land is in Asia. [117,1,1]
34. E Spanish irrigation works focused on canals managed and financed by water use associations. [117,2,0]
35. A The money multiplier describes the value the banking sector generates with each dollar of reserves and is the reciprocal of the reserve ratio. If the reserve ratio is 0.10, the money multiplier must thus be 10. [90,2,3]
36. A The M1 money supply consists of relatively liquid assets and includes demand deposits. [88,2,2; 88,1,0]
37. D The velocity of money times the money supply is equal to the price level times the real Gross Domestic Product—also known as the nominal Gross Domestic Product. [94,2,2; 94,2,4]
38. A Gross Domestic Product measures the market value of all final goods and services and excludes intermediate goods, which are used in the production of final goods sold to consumers. The \$400 worth of seashells Sally sells directly to consumers thus counts toward Gross Domestic Product, as does the \$5,000 worth of jewelry. [68,2,0]
39. B To find market supply and demand curves, one must horizontally add all individual supply and demand curves, respectfully. The interaction between these market supply and demand curves determines the market price and quantity of a good or service. [15,1,2; 13,2,1]
40. A Inflation is a macroeconomic issue, and a normative economic statement involves a value judgement—in this case, whether it is worth increasing inflation. [9,1,1; 8,1,2]
41. A The South-North Water Transfer Project transfers water from the Yangtze River to the Yellow River. [114,1,0]
42. A The real interest rate reflects the real value lenders receive from saving their money and thus is adjusted for inflation. The real interest rate is calculated by subtracting the inflation rate from the nominal interest rate. [84,2,5; 85,1,0]
43. B The appropriative rights doctrine governs MOST property rights of water. Riparian systems rely on this doctrine. [119,2,2]
44. B Luxury cars are a normal good, and as consumers' incomes fall, they will demand less of it, shifting the demand curve to the left. The new equilibrium point will be located below and to the left of the previous equilibrium, signifying a decrease in both equilibrium price and quantity. [23,1,1; 23,2,0; 23,2,1; 25,1,1; 13,2,4]
45. E New knowledge is a public good—meaning it is non-rival in consumption and non-excludable—and thus governments often incentivize it through subsidies or similar programs. [80,2,4]
46. C Nominal Gross Domestic Product uses current year prices; thus, the base year prices and quantities are irrelevant in this example. The economy's nominal Gross Domestic Product equals the sum of 700 water bottles times \$20 per water bottle and 150 tablets times \$100 per tablet, yielding a result of \$29,000. [72,2,1]
47. B Common-pool resources such as water are difficult to enact exclusionary criteria. They are prone to suffering from the tragedy of the commons. [113,1,1]
48. B Money functions as a unit of account by allowing consumers to assess the relative economic value of different goods and services using a standardized unit of measurement. [87,2,3]
49. A Economic growth—improving living standards—began to sustainably occur in Western Europe and the United States approximately 200 years ago. [77,1,4; 77,2,0]
50. B Goods with close substitutes usually have high price elasticities of demand. If the price of the good increases, consumers can easily switch to a substitute good, so the quantity demanded of the original good will decrease substantially. [25,2,3]

1. C Simon Kuznets received the 1971 Nobel Prize in Economic Science in recognition of his work to measure national economic output. [70,2,0]
2. D Cereal and milk are complementary goods, as they are frequently consumed together. A decrease in the price of milk will lead more consumers to purchase milk, which, all other things being equal, will increase the demand for cereal and therefore shift the demand curve to the right. [14,1,0]
3. C Prices will increase in a water market if the water producer exports water at a higher price. [122,1,2]
4. A Low water quality standards could lead to high health care costs. Water standards that are too high could divert investment from other infrastructure areas. [126,2,0]
5. C The real interest rate reflects the real value lenders receive from saving their money and thus is adjusted for inflation. The real interest rate is calculated by subtracting the inflation rate from the nominal interest rate. [84,2,5; 85,1,0]
6. A Increasing aggregate demand and aggregate supply will shift the curves to the right, placing the new equilibrium point to the right of the previous equilibrium, signifying an increase in output. Depending on the size of the shifts, the new equilibrium point may be below, above, or at the same level as the previous equilibrium, so the new price level cannot be determined. [104,2,3; 104,2,4]
7. E Led by economist Michael Boskin, Boskin Commission studied the Consumer Price Index and determined that it overstated the true rate of inflation by 1.3 percent yearly. [74,2,3]
8. B While Gross Domestic Product (GDP) per capita measures economic output per person, labor productivity measures economic output per worker. The former measurement provides insight into citizens' consumption abilities. [62,2,1; 62,1,1]
9. B The efficient level of production is the point where marginal social costs equal demand. [123,2,2]
10. B Most humans perform cost-benefit analysis intuitively; studying economics can improve humans' intuitive decision-making. [7,2,1]
11. A Mormon settlers developed advanced irrigation in Utah in the nineteenth century. [118,1,0]
12. A Money functions as a store of value by allowing users like Da'Vion to convert current-day purchasing power into future purchasing power. [87,2,4]
13. D The law of demand outlines an inverse relationship between a good's price and the quantity of it consumers demand. Decreasing the price of computers would therefore increase the quantity of peaches consumers demand. [12,2,1]
14. E The M2 money supply consists of all assets in the M1 money supply in addition to several other assets like savings deposits and retail money funds. Thus, increasing the size of M1 by \$5 billion will also expand the M2 money supply by the same amount. [88,2,2]
15. D Inferior goods are purchased more often when income falls. If Josh had to pay for his own expenses instead of using his parents' support, his income would fall and he would purchase more inferior goods. [13,2,5]
16. D The equilibrium point is located at the intersection of the market supply and demand curves. At this point, the quantity supplied must equal the quantity demanded; thus, to find the market equilibrium price, one must set Q_D equal to Q_S and solve for P. In this case, the equilibrium price is \$15. Since the market price is lower than the equilibrium price, there will be more consumers who want to buy the good than there are producers who want to sell it, resulting in excess demand. [15,2,6; 18,2,2; 18,1,1]
17. B A country's net capital outflow is equal to the purchase of foreign financial assets by that country's residents minus the purchase of domestic financial assets by foreigners. [83,2,3]
18. C The supply curve is upward sloping because there is a positive relationship between price and quantity supplied. This relationship is called the law of supply. [15,1,3]
19. B Created by economist Arthur Okun, Okun's Law holds that a one percent deviation in the unemployment rate from the natural rate of unemployment corresponds to a two percent deviation in the output gap. [100,1,0]
20. E Input prices can shift the supply curve for a particular good or service. In this case, flour is an input in the production of cakes. An increase in the price of flour will increase cake producers' costs, which will decrease the number of cakes they are able to supply at all prices, shifting the supply curve to the left. [15,1,4; 15,2,0]
21. E One can calculate real Gross Domestic Product by multiplying the quantity of each good sold by that good's price in the base year. In this example, one would multiply 80 sweatshirts by their 2000 price of \$25 and multiply 100 computers by their 2000 price of \$200. Then, one should sum the market value of all goods in the economy, which in this example means only sweatshirts and computers, yielding a result of \$4,000. The economy's nominal Gross Domestic Product uses current year prices and equals the sum of 80 sweatshirts times \$50 per sweatshirt and 100 computers times \$250 per computer, yielding a result of \$6,500. [72,2,0; 72,2,1]

22. A Necessities tend to have low price elasticities of demand. Even if the price of the good or service increases, most consumers will still need to purchase the good or service, so the quantity demanded will not decrease as substantially as it would for a luxury. [25,2,4]
23. B Wool is an input in the production of wool sweaters, so a decrease in the price of wool will reduce suppliers' costs and thus increase the amount they can supply at any price, shifting the supply curve to the right. The new equilibrium point will be located below and to the right of the previous equilibrium, signifying a reduction in equilibrium price and an increase in equilibrium quantity. [23,1,1; 23,2,0; 23,2,1; 25,1,1; 15,1,4]
24. D A bilateral monopoly describes a market situation where players on both sides of an exchange can exercise bargaining power. This situation occurred with for-profit canal owners and farmers in the United States. [118,1,1]
25. C Pigouvian taxes require firms to pay a tax per unit of pollution emitted, which increases the cost of production. [124,2,2]
26. C An anti-drinking outreach campaign causes the demand for alcohol to shift left. Thus, equilibrium price rises and equilibrium quantity falls. [25,1,3]
27. A In a cap-and-trade market, the regulator sets the total permissible amount of pollution and allocates pollution permits to each firm. [127,1,1]
28. A The Clean Water Act regulates point source such as wastewater plants and manufacturing firms. [125,1,1]
29. E Consumer surplus is the difference between the price customers are willing to pay and the price they actually have to pay. Producer surplus is the difference between a seller's opportunity cost and market price. $(300-200) + (600-200) + (400-200)$. [20,1,2]
30. D Consumer durables, like dishwashers, are long-lasting goods purchased by households. [71,1,1]
31. B Scarce resources, like beachfront vacation homes, have a relatively inelastic supply. Less scarce resources, like homes in general, have a more elastic supply. The higher elasticity of less scarce resources is reflected in a supply curve that is more horizontal. [26,2,1; 26,2,3]
32. B Trade-offs mean that every choice we make requires us to give up something. Susannah gives up time watching TikTok videos in order to do her homework. [7,1,1]
33. D If the market price for a good or service is less than the equilibrium price, there will be more consumers who want to buy the good or service than there are suppliers who want to supply it, resulting in excess demand. [18,2,2]
34. E In the circular flow model of the economy, households provide factors of production—like capital, land, and labor—to firms in exchange for income. [77,2,3]
35. C British economist John Maynard Keynes wrote the book *The General Theory of Employment, Interest, and Money* as a response to poor government policies during the Great Depression. [101,2,4]
36. B Financially-shaky borrowers must charge relatively high interest rates to compensate lenders for assuming the risk that they will default on their obligation. Moreover, bonds with longer maturities also present the risk of potential future changes in price, so borrowers have to pay lenders a higher interest rate to account for that additional risk. [81,2,2; 81,2,3]
37. B Banks and mutual funds are examples of financial intermediaries, third-party institutions that connect savers with borrowers. [82,1,3]
38. B Gross Domestic Product measures the market value of all final goods and services and excludes intermediate goods, which are used in the production of final goods sold to consumers. All of the tomatoes Anais harvests are intermediate goods and thus do not directly contribute to Gross Domestic Product. [68,2,0]
39. E If the demand curve shifts right, the new equilibrium point will be located above and to the right of the previous equilibrium, signifying an increase in equilibrium price and quantity. [23,1,1; 23,2,0; 23,2,1; 25,1,1]
40. A The velocity of money times the money supply is equal to the price level times the real Gross Domestic Product—also known as the nominal Gross Domestic Product. [94,2,2; 94,2,4]
41. C When a country exports more than it imports, it is in a trade surplus. [66,1,2]
42. D Tax cuts, like those that occurred in the United States in 2017, leave consumers with more disposable income, allowing them to spend more, thus increasing aggregate demand and shifting the aggregate demand curve to the right. [102,2,2]
43. C Though the formal study of economics began in the eighteenth century, early works by thinkers like Aristotle dealt with economics-related topics. [5,1,1]
44. E Normative economics uses value judgments to weight the relative merits of different possible economic outcomes. [8,1,2]
45. D The labor force participation rate, which measures the percentage of the working-age population that is in the labor force, is close to 60 percent. [75,2,2]
46. B Terminal saline lakes form when watersheds drain into basins. One example includes the Aral Sea. [120,3,1]
47. D The irrigation efficiency paradox dismisses the idea that increased water efficiency leads to large increases in usable water. It usually leads to small gains. [119,1,2]

48. A The money multiplier describes the value the banking sector generates with each dollar of reserves and is the reciprocal of the reserve ratio. If the reserve ratio is 0.10, the money multiplier must thus be 10. [90,2,3]
49. B Pareto efficiency applies when there is no way to improve at least one person's well-being without reducing the well-being of someone else. Because Christopher and Katherine wasted half a scoop, this is not the socially optimal (or Pareto efficient) situation. [8,2,1]
50. B The reduction in oil prices constitutes a positive supply shock that increases aggregate supply, and increased investment spending increases aggregate demand. Increasing both aggregate demand and supply will shift both curves to the right, placing the new equilibrium above and to the right of the previous equilibrium, signifying an increase in both the price level and output. A central government or bank may be worried about inflationary pressures on the economy and may seek to bring the economy's output closer to its potential output. It could do so by raising the reserve requirement and selling government bonds, both of which shrink the money supply—thus raising the interest rate, disincentivizing consumers and firms to take out loans and, consequently, decreasing aggregate demand. [104,2,3; 104,2,4; 102,2,2; 102,2,3; 104,1,1; 91,1,2; 91,1,3]

1. A A price floor creates excess supply . The market would revert to equilibrium, i.e. lower price, higher quantity, no excess. Change in producer revenue is ambiguous (depends on relative elasticities) while consumer surplus increases. [33,1,3;34,fig.]
2. D The Sherman Anti-Trust act sought to increase market competition. Public ownership of utilities by municipal governments is a tactic used to also increase market competition. [47,2,1]
3. A Staple cereals require 450 – 700 mm per year. Most of the world's irrigated land is in Asia. [117,1,1]
4. A At any point along the demand curve, the height of the curve measures the marginal purchaser's willingness to pay. [20,2,3]
5. E In the circular flow model, injections are investment, government spending, and exports; and withdrawals are saving, taxation and imports. An increase in investment leading to an increase in income then results in an increase in savings. [80,fig; 80,1,1-81,1,4]
6. A Profit-maximizing firms increase supply until marginal cost equals marginal revenue. [45,2,2]
7. B Inflation reduces the value of money and makes people go to the bank or ATM more frequently. Firms have to readjust their prices more frequently. Inflation distorts prices. Consumers are unsure about the value of their money in the future. [97,2,5]
8. E The GDP deflator = $100 \times (\text{Nominal GDP}) / (\text{Real GDP})$. [77,1,1]
9. E The level of unemployment caused by frictional and structural causes is called the natural rate of unemployment. [102,1,1]
10. D Antique stamps are valuable because they are rare, not because they are any more useful than regular stamps. [111,1,3]
11. A If capital goods were not included, then a country that invested by building capital equipment would appear to have lower GDP than one that used its resources to produce consumer goods. [72,1,2]
12. B When there is excess supply, sellers are incentivized to lower their prices and attract new buyers. [18,2,1]
13. D In a situation with perfectly elastic demand, consumers will buy any quantity at a certain price (in our example, \$47.) If that price rises then they will buy none, but if that price falls they will buy an infinite quantity. [28,1,0]
14. C Agricultural uses of water consume most of the world's water. Farmers perform agriculture. [112,1,2]
15. B Changes individuals expect to occur in the future impact quantity demanded. If Peter thinks he will get a pay raise soon, he might be incentivized to spend more money on things like notebooks. [14,2,1]
16. E The government steps in to regulate externalities when private bargaining fails. Governments use subsidies, taxes, and permits. They can create markets for the sale of permits to encourage competition. [53,2,2]
17. B The Italian economist Vilfredo Pareto first described Pareto efficiency, a situation in which there is no way to improve at least one person's well-being without reducing the well-being of someone else. [8,2,1]
18. C Households receive income by providing factors of production to firms. [80,2,1]
19. C Market equilibrium occurs at the intersection of equilibrium price and equilibrium quantity. [18,1,1]
20. C Firms facing a downward sloping demand curve possess market power. They can choose market prices. [44,1,2]
21. A The demand for money depends on how much of their wealth people wish to hold as money. Most people choose to hold money rather than other assets because money is a useful medium of exchange. [95,1,4]
22. C Economic models are simple and theoretical. They are often represented in the forms of mathematical formulae or diagrams. They are not extremely realistic because their general qualities can be applied to many situations. [7,2,4]
23. B When state government reduce spending by laying off employees, aggregate demand shifts right because there is less overall demand in the economy. [106,2,1]
24. D The most common cause of shifts in the position of the aggregate supply curve is changes in the expected price level. Short-run aggregate supply is equal to Y^* at the expected aggregate price level, so changes in that price level cause the aggregate supply curve to shift up and down. [107,1,1]
25. B Spring Valley Water Works was the sole entity that provided San Francisco with water in the early 1900s. [115,1,1]
26. D By allocating water through institutions such as courts and regulators, states can address the tragedy of the commons. This problem faces collectively held goods. [113,1,1]
27. E In the 1970s, The Green Revolution caused many farmers to adopt high-yield seed varieties and fertilizers. [118,1,0]
28. C The Aral Sea is located between Kazakhstan and Uzbekistan. It has experienced depletion. [120,3,2]
29. D Spanish water law consists on a series of customs for allocating water based on prior usage and need. [119,2,1]
30. E A low price level encourages savings. A higher supply of savings causes interest rates to fall. Households and firms borrow funds to increase their spending. Therefore, aggregate demand shifts right. [106,1,1]

31. D The unemployment rate in 2008 was highest among the teenage population. 25% of teenagers were unemployed. [77,2,5]
32. B In the 1970s, the Indian government provided energy subsidies to access water for irrigation. It created incentive for unsustainable water use. [116,3,1]
33. A Because Pierre had to decide about what to spend his money on, he faced a trade-off. The value of the sneakers he forwent is the opportunity cost of his choice. [7,1,1]
34. C So long as trading partners differ in their comparative advantages, they can improve their well-being by specializing. [39,1,4]
35. B Goods for which the quantity demanded falls as income rises are called inferior goods. If Wanda is demanding more normal goods, her income must have risen. [13,2,4]
36. B Appropriative water rights systems, such as riparian systems, require that water use does not inflict injury to third parties. [120,2,1]
37. D Claiming that the United States' infrastructure spending is too high involves a value judgment, making it a normative statement. [8,1,2]
38. B Microeconomics and macroeconomics have different focuses but share a set of assumptions about human behavior. [5,1,2]
39. D Some businesses are too small to issue bonds, so they borrow from banks to finance their investments. [84,2,5]
40. A The two broad categories of market failures and externalities and the breakdown of private property. [50,2,2]
41. C While monopolies rely on barriers to entry to maintain positive economic profits, a monopolistically competitive market does not have barriers to entry. [49,1,4]
42. E When accounting for the social cost of a negative externality caused by a supplier, the supply curve shifts upward to reflect the cost of fixing the externality. [51,2,0]
43. B As fewer people smoke, fewer people will develop lung cancer. Thus, the demand for lung cancer treatment falls at every point, shifting the demand curve left. [13,2,2]
44. A When a decline in the price of one good causes a reduction in the quantity demanded of another, those goods are substitutes. Coffee and tea are substitutes. [14,1,0]
45. D The most important factor that influences the quantity supplied is price. The higher the price, the greater quantity that sellers will want to produce. [15,1,1]
46. B Ecosystem services such as water can cause market failure because they are unpriced. Market failure occurs when a good or service is not allocated efficiently in a market. [111,2,1]
47. D Efforts to offset short-run economic fluctuations are significantly delayed by government actors. For instance, it takes Congress six months to a year to authorize spending. By the time spending is authorized, the economy might already recover. [112,2,1]
48. D Public goods have low rivalry and low excludability. [57,1,0]
49. D Every point on a PPF curve is efficient and maximizes the producer's capacity. He or she produces at whatever point on the curve he or she prefers. Points above the curve are unattainable and points below the curve are inefficient. [31,2,1-3]
50. E When a country's domestic price is lower than the world price and it opens to global trade, then it will become an exporter. Suppliers benefit while consumers suffer. Social welfare increases. [39,2,3]

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1. D Because the supply curve is upward sloping and the demand curve is downward sloping, they intersect in one point. That point is market equilibrium. [18,1,1]
2. C Phosphorus and nitrogen are nutrients that contribute to eutrophication. This process leads to algal blooms. [128,1,1]
3. B The government purchases goods and services using money it earns through taxes and money it borrows from financial markets. [78,1,0]
4. C The more specifically a market, the more close substitutes there will be, yielding a relatively high elasticity of demand. In this example, there are many close substitutes for Oreos but fewer for cookies or snacks. [25,2,5]
5. A Money functions as a medium of exchange by facilitating the purchase of goods and services by consumers like Tom. [87,2,2]
6. D Intermediate goods are used in the production of final goods sold to consumers, and they are not included in Gross Domestic Product. [68,1,1; 68,2,0]
7. A If sellers expect prices to rise in the future, they may reduce quantity and store up their inventories in expectation of higher future prices. [15,2,3]
8. B A country's net capital outflow is equal to the purchase of foreign assets by that country's residents minus the purchase of domestic assets by foreigners. Thus, Amazon's purchase of a factory overseas would increase the United States' net capital outflow. [83,2,4]
9. E Increases in aggregate demand—which consists of consumption, investment, government purchases, and net exports—shift the aggregate demand curve to the right. Because transfer payments do not factor into government purchases, however, these transactions would not shift the aggregate demand curve. [101,1,6; 102,2,1]
10. B If the supply curve shifts right, the new equilibrium point will be located below and to the right of the previous equilibrium, signifying a decrease in equilibrium price and an increase in quantity. [23,1,1; 23,2,0; 23,2,1; 25,1,1]
11. A The price of related goods, tastes, consumer income, and the number of buyers all can shift the demand curve. The price of oranges would not, however, shift the demand curve for oranges. Rather, a change in price would cause a movement along the curve—a change in the quantity demanded by consumers. [13,2,4; 13,2,6; 14,1,1; 14,2,1]
12. D The unemployment rate equals the percentage of the labor force that is unemployed. In this example, there are 20 million people in the labor force, 5 million of whom are unemployed, yielding an unemployment rate of 80%. [74,2,6]
13. C Recessions occur between economic peaks and troughs; expansions occur between troughs and peaks. [64,1,2]
14. D Optimal regulation focused on pollution reduction will set the marginal control cost equal to the social marginal damage. Regulations can be prescriptive or economic. [124,2,1]
15. E Created by economist Arthur Okun, Okun's Law holds that a one percent deviation in the unemployment rate from the natural rate of unemployment corresponds to a two percent deviation in the output gap. [100,1,0]
16. B The height of any point along a market demand curve indicates the willingness to pay of the marginal buyer—who, at that given price, is indifferent as to whether they purchase the good or not. [20,1,3]
17. B Every month, the United States Bureau of Labor calculates the Consumer Price Index as a measure of inflation. It is more volatile than the Gross Domestic Product Deflator. [74,2,2; 72,2,2; 72,2,3]
18. C Though fiscal and monetary policy can help stabilize a faltering economy, there are often significant time delays associated with their use, and so they are sometimes not practical solutions to short-run economic fluctuations. [109,1,0; 109,1,2; 109,1,3; 109,1,4]
19. E A board of governors heads the Federal Reserve, with each governor serving a fourteen-year terms. [89,1,3]
20. A Decreasing aggregate demand and increasing aggregate supply will shift the aggregate demand curve to the left and the short-run aggregate supply curve to the right, placing the new equilibrium point below the previous equilibrium, signifying a decrease in the price level. Depending on the size of the shifts, the new equilibrium point may be to the right of, to the left of, or in the same horizontal place. [104,2,3; 104,2,4]
21. B In a cap-and-trade market, regulators can prevent pollution hot spots by limiting the amount of pollution credits a firm can buy. These hot spots occur when firms create localized points of heavy pollution. [127,2,0]
22. C Natural flow systems require that users consume water for domestic purposes, and each user is entitled to the maintenance of their adjacent watercourse. [120,1,1]
23. E Input prices can shift the supply curve for a particular good or service. In this case, steel is an input in the production of cars. An increase in the price of steel will increase car manufacturers' costs, which will decrease the number of cars they are able to supply at all prices, shifting the supply curve to the left. [15,1,4; 15,2,0]
24. D If, in the aggregate, firms want to borrow more money, the demand for savings will increase, shifting the demand curve to the right. The new equilibrium point is above and to the right of the previous equilibrium point, raising the real interest rate and increasing the equilibrium level of saving and investment . [87,1,1; 25,1,2]

25. D Producer surplus equals the difference between market price and a seller's opportunity cost. $(50-20)+(40-20) = 50$. [22,1,0]
26. A Individual savers can put their money in a mutual fund consisting of various stocks and bonds. Because their values are tied to a portfolio of different assets, mutual funds allow for diversification than do individual stocks. [82,2,4]
27. E A demand schedule shows the quantity demanded for a good at different prices. A demand curve is the graphical representation of a demand schedule. [13,1,2]
28. E Currencies are a highly competitive homogenous good, with prices that are updated frequently and easily accessible to the buyers, many buyers and sellers, and a high degree of standardization. [10,2,1-11,1,1]
29. A The velocity of money measures the average number of times a typical dollar bill is used every year in an economy. The velocity of money times the money supply is equal to the price level times the real Gross Domestic Product—also known as the nominal Gross Domestic Product. [94,2,2]
30. E The value of a bond fluctuates depending on market interest rates. [81,2,1; 81,2,2; 81,2,3]
31. D The zebra mussel was introduced to the Great Lakes as early as the 1980s from Europe and Asia. [125,2,1]
32. B Total revenue is equal to the product of equilibrium price and equilibrium quantity. Graphically, the area formed by a rectangle with vertices at the equilibrium point, the origin, a point on the y-axis, and a point on the x-axis represents total revenue. [26,2,6]
33. E In the 1970s, the United States' importance began consistently exceeding its exports, meaning that it has a trade deficit. [66,1,2; 66,2,0]
34. B In a riparian system, users must live along a water body's path. Water is allocated based on a seniority system. [119,2,3]
35. D Some economists, including Simon Kuznets, have noted that national defense allows citizens to enjoy final goods and services and thus can be considered an intermediate good. Intermediate goods are not included in Gross Domestic Product calculations. [70,2,2]
36. B A higher discount rate—the interest rate the Federal Reserve charges on loans to other banks—discourages those banks from taking loans, thus contracting the money supply. [91,2,0]
37. D Microeconomics and macroeconomics both share common assumptions about the basic features of human behavior (e.g. rationality, etc.) [9,1,2]
38. D Raising the minimum wage would likely raise incomes for some minimum-wage workers but cause others to lose their jobs. [8,1,3]
39. B There are 33,000 items in an average supermarket, each product a consequence of a chain of decisions made by self-interested economic actors. [6,1,2]
40. D The Safe Drinking Water Act granted the Environmental Protection Agency the authority to set water quality standards in the United States. [126,2,1]
41. B The equilibrium point is located at the intersection of the market supply and demand curves. At this point, the quantity supplied must equal the quantity demanded; thus, to find the market equilibrium price, one must set Q_D equal to Q_S and solve for P. Then, one can substitute the numerical value of P into either one of the provided equations to solve for the equilibrium quantity. [15,2,6]
42. B In *An Inquiry into the Nature and Causes of the Wealth of Nations*, Adam Smith asserts that humans are motivated by incentives, the collective result of which is an economy that satisfies consumers' desires. [6,1,1]
43. D Positive economists analyze cause-and-effect relationships and measure their size. They make value-free judgments. [8,1,1]
44. E Net exports are the difference between exports—goods produced domestically that a country sells overseas—and imports—goods produced overseas that are sold domestically. In this case, Arrakis's exports are \$100 million, and its imports total \$50 million, meaning that its net exports are \$50 million. [71,2,3]
45. E Increasing the number of sellers will increase supply at all prices, shifting the supply curve to the right. The new equilibrium point will be located below and to the right of the previous equilibrium, signifying a reduction in equilibrium price and an increase in equilibrium quantity. [23,1,1; 23,2,0; 23,2,1; 25,1,1; 15,2,3]
46. D Gross Domestic Product Deflator is equal to 100 times the ratio of nominal Gross Domestic Product to Real Gross Domestic Product. [74,2,1]
47. B Before the 1950s, third-party impairment was not an issue because traded water stayed within the local community. Challenges began arising as water left the local community. [122,2,3]
48. D Acequias are found in New Mexico and other areas of the Western United States. [118,2,1]
49. E Aggregate supply shocks, like a major drought, decrease aggregate supply and thus shift the aggregate supply curve to the left. [104,1,1]
50. C The Antofagasta Region in Chile has high water demand as it is the world's largest copper producer. Its receives less than 5 mm of rain per year. [123,1,2]

1. C Consumers' expectations can shift the aggregate demand curve. If, for example, consumers expect to lose their jobs in the next month, they will decrease their consumption, shifting the aggregate demand curve to the left. [14,1,2; 14,2,0]
2. A During recessions, economies typically have high employment and slow wage growth. During the Great Depression, for instance, unemployment rates exceeded 20 percent. [64,2,1; 64,2,3]
3. D The more broadly that one defines a market, the fewer close substitutes there will be, yielding a relatively low elasticity of demand. In this example, there are more substitutes for Pepsi or Coca-Cola than there are for beverages in general. [25,2,5]
4. B In a closed economy, $Y - C - G$ represents the economy's total income minus consumer and government spending, thus yielding national savings. [83,1,3]
5. D Gross Domestic Product Deflator is equal to 100 times the ratio of nominal Gross Domestic Product to Real Gross Domestic Product. [74,2,1]
6. C Microeconomics and macroeconomics share basic assumptions about human behavior, but their modes of analysis and the scale of their focus differs. [9,1,2]
7. A Economies of scale will result in low marginal production costs. Water tends to benefit from economies of scale. [114,1,1]
8. D A demand curve is the graphical representation of demand schedule, representing the quantity demanded of a good or service at various prices. [13,1,3]
9. C The appropriative rights doctrine allocates water based on a seniority system. Riparian systems follow this approach. [119,2,2]
10. D A flat fee system will charge the same price per unit of water consumed. In the example provided, the flat fee is the yearly consumption fee. [115,2,2]
11. C Using the expenditures method, Gross Domestic Product equals the sum of consumer spending, investment, government spending, and net exports—exports minus imports. [71,2,4]
12. E Intermediate goods are used in the production of final goods sold to consumers, and they are not included in Gross Domestic Product. [68,1,1; 68,2,0]
13. C Adam Smith wrote *An Inquiry into the Nature and Causes of the Wealth of Nations*, in which he described how self-interested individual actions could collectively form a well-running economy. [6,1,1]
14. D Decreasing the number of sellers will decrease supply at all prices, shifting the supply curve to the left. The new equilibrium point will be located above and to the left of the previous equilibrium, signifying an increase in equilibrium price and a reduction in equilibrium quantity. [23,1,1; 23,2,0; 23,2,1; 25,1,1; 15,2,3]
15. A The equilibrium point is located at the intersection of the market supply and demand curves. At this point, the quantity supplied must equal the quantity demanded; thus, to find the market equilibrium price, one must set Q_D equal to Q_S and solve for P. Then, one can substitute the numerical value of P into either one of the provided equations to solve for the equilibrium quantity. [15,2,6]
16. E In the circular flow model of the economy, firms provide goods and services to the markets for goods and services in exchange for revenue that comes from households' consumer spending. [78,1,0]
17. B If the demand curve for a particular good is nearly horizontal, the price elasticity of demand for that good is high. As a result, consumers will eagerly respond to a price decrease by increasing their quantity demanded by a greater proportion than the proportion by which price falls, increasing total revenue. [26,2,7; 26,1,2]
18. B The interest rate a borrower must pay lenders depends on the borrower's credit risk: the more financially risky the borrower is, the higher interest rate it must charge to compensate lenders for taking on increased risk. Compared to some smaller corporations, the United States government is relatively financially stable, so it can charge a lower interest rate. [81,2,3]
19. B The Federal Reserve engages in open market operations by selling or buying United States government bonds. It sells government bonds to shrink the money supply and buys bonds to expand the money supply. Though lowering the reserve requirement and discount rate would also expand the money supply, they are not open market operations. [89,2,1]
20. D Money functions as a medium of exchange by facilitating the purchase of goods and services by consumers like Chris. [87,2,2]
21. B A German company's 2019 purchase of a factory in Chicago would be counted in the United States' 2019 Gross Domestic Product because it is a capital good, and the transaction occurred within the United States—even though the purchaser is a foreign firm. [69,2,1; 70,1,2]
22. B Approximately 70% of the world's irrigated land is located in Asia. [117,1,1]

23. B Increasing aggregate demand and decreasing aggregate supply will shift the aggregate demand curve to the right and the short-run aggregate supply curve to the left, placing the new equilibrium above the previous equilibrium, signifying an increase in the price level. Depending on the size of the shifts, the new equilibrium point may be to the right of, to the left of, or in the same horizontal place as the previous equilibrium, so the new output level cannot be determined. [104,2,3; 104,2,4]
24. E When a lower price for one good causes demand for another good to increase, those goods are complements. The sale on ice cream made Bilbo buy waffle cones, so those goods are complements. [14,1,1]
25. A Consumer surplus represents the surplus value consumers receive and occurs when consumers' willingness to pay exceeds the market price. Total consumer surplus is found by adding the difference between the market price and the willingness to pay of every consumer who buys the good or service. In this example, Bank and Sophia contribute to consumer surplus; Frank does not, as he will not buy the ticket since his willingness to pay is less than the market price. [20,1,5; 20,2,0]
26. D The law of supply states that the higher the price is, the greater the quantity that sellers will want to produce. [15,1,1]
27. B Real Gross Domestic Product is a measure of economic output adjusted for inflation; if there is no inflation, however, it equals nominal Gross Domestic Product, which is economic output in the current year's prices. [72,2,1]
28. E The Yellow River has experienced extended dry periods, which has prompted the development of the South-North Water Transfer Project. [113,2,1]
29. D The breakdown of the national highway system would cause the supply curve to shift left. Sellers reduce supply when they expect higher prices in the future, which also shifts the supply curve left. [15,2,3]
30. D Economist Vilfredo Pareto, who introduced the concept of Pareto efficiency, came from Italy. [8,2,1]
31. B Excess nitrogen runoff can lead to large-scale fish population collapse due to eutrophication. [113,2,0]
32. C A bank is solvent if its assets exceed its liabilities. If a solvent bank has \$30 million in assets, it must have less than \$30 million in reserves. [91,2,2]
33. D If the supply curve shifts left, the new equilibrium point will be located above and to the left of the previous equilibrium, signifying an increase in equilibrium price and a decrease in quantity. [23,1,1; 23,2,0; 23,2,1; 25,1,1]
34. C Because Country Y's labor force participation rate is 60% and its population is 50 million, it has 30 million people in its labor force. 6 million are unemployed, yielding an unemployment rate of 20%. [74,2,6; 75,2,1; 75,2,2]
35. D Consumptive water use occurs when the water cannot be reused for other purposes. A farmer irrigating his crops is an example because the water is absorbed by plants. [112,2,0]
36. E As Indian agriculture grew in the 1970s, it became more difficult to maintain water meters and regulate the use of water. [116,3,1]
37. E Created by economist Arthur Okun, Okun's Law holds that a one percent deviation in the unemployment rate from the natural rate of unemployment corresponds to a two percent deviation in the output gap. [100,1,0]
38. A The opportunity cost of a choice is the value of the next-best option, so a plausible opportunity cost of military spending might be the social services the government would have otherwise provided. [7,1,2]
39. C The velocity of money measures the average number of times a typical dollar bill is used every year in an economy. The velocity of money times the money supply is equal to the price level times the real Gross Domestic Product—also known as the nominal Gross Domestic Product. [94,2,2]
40. D A country's net capital outflow is equal to the purchase of foreign assets by that country's residents minus the purchase of domestic assets by foreigners. Thus, the purchase of a United States asset by a foreign company would decrease the United States' net capital outflow. Moreover, because Honda purchases a factory—an asset they will actively use and manage—the international capital flow is a foreign direct investment. [83,2,4; 83,2,5]
41. B The Green Revolution led to food production increases through the introduction of fertilizer and high-yield crops. [118,1,0]
42. C If, in the aggregate, firms want to borrow less money, the demand for savings will decrease, shifting the demand curve to the left. Consequently, the new equilibrium point is below and to the left of the previous equilibrium point, lowering the real interest rate and decreasing the equilibrium level of saving and investment in the economy. [87,1,1; 25,1,2]
43. E Markets, like the New York Stock Exchange, describe the interactions between buyers and sellers. [10,2,2]

44. A Increases in aggregate demand—which consists of consumption, investment, government purchases, and net exports—shift the aggregate demand curve to the right. Because government interest payments on government debt do not factor into government purchases, however, these transactions would not shift the aggregate demand curve. [101,1,6; 102,2,1]
45. C Intermediate goods are used in the production of final goods sold to consumers, and they are not included in Gross Domestic Product. [68,1,1; 68,2,0]
46. D Demand is positively related to income. For normal goods, quantity demanded rises when income rises. [13,2,4]
47. E The interaction of supply and demand in markets is the central topic of microeconomics. [10,1,2]
48. A Input prices can shift the supply curve for a particular good or service. In this case, plastic is an input in the production of plastic water bottles. A decrease in the price of plastic will decrease water bottle producers' costs, which will increase the number of bottles they are able to supply at all prices, shifting the supply curve to the right. [15,1,4; 15,2,0]
49. A Economic institutions include legal systems, property rights, and government regulations. [111,2,3]
50. A An especially good harvest season in the United States would increase aggregate supply in the economy, thus shifting the aggregate supply curve to the left. [104,1,1]

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1. D Using the expenditures method, Gross Domestic Product equals the sum of consumer spending, investment, government spending, and net exports—exports minus imports. [71,2,4]
2. B Between 1940 and 1978, irrigated acreage in the United States doubled (100%) due to the widespread adoption of groundwater irrigation. [118,3,1]
3. D Steve's demand for windshield wiper fluid will decrease if his car breaks down, shifting the demand curve left. A PSA encouraging carpooling will decrease the amount than any individual drives and will also decrease demand for windshield wiper fluid. [14,1,0]
4. E When consumers' income rises, they demand less of inferior goods. As consumers become wealthier, they will likely, on average, use public transportation less, making it an inferior good. [13,2,4]
5. D Consumer surplus represents the surplus value consumers receive and occurs when consumers' willingness to pay exceeds the market price. Total consumer surplus is found by adding the difference between the market price and the willingness to pay of every consumer who buys the good or service. In this example, all three buyers contribute to consumer surplus, as they all receive a surplus benefit from their purchases. [20,1,5; 20,2,0]
6. A In perfect competition, there are a large number of buyers and sellers, none of whom possess market power. Colluding producers are therefore not a feature of perfectly competitive markets. [11,1,1]
7. A The Clean Water Act (CWA) regulates point sources such as wastewater plants by establishing pollutant reduction requirements. [125,1,1]
8. E Aggregate supply shocks, like a major hurricane, decrease aggregate supply in the short run and thus shift the short-run aggregate supply curve to the left. The long-run supply curve, however, does not change. [104,1,1]
9. C Los Angeles diverted all inflow from Owens Lake and completely dried it out. [121,1,0]
10. C Consumer surplus is the total benefit that consumers receive by buying a good below the cost that they could pay. Two people buying concert tickets for \$50 when they would have spent \$90 each gives a consumer surplus of \$80. [21,Figure 8]
11. B The opportunity cost of a choice is the value of the single next-best option—not multiple alternative options—so an opportunity cost of Tom's choice might be the value of working out. [7,1,2]
12. C If the demand curve for a particular good is nearly vertical, the price elasticity of demand for that good is low. As a result, consumers will not significantly cut back on their consumption of the good, even as its price increases. As a result, total revenue will increase. [26,2,7; 26,1,2]
13. A Introduced by economist Vilfredo Pareto, Pareto efficiency necessitates that no person can be made better off without detracting from another person's well-being. [8,2,1]
14. E Technological advancement that increases producers' efficiency can shift the supply curve for a particular good or service. In this case, suppliers can now increase the number of backpacks they can supply at all prices, thus shifting the entire supply curve to the right. [15,2,1]
15. A High unemployment makes it more difficult for workers to increase their wages in addition to increasing the difficulty of finding work. [64,2,2]
16. C Elinor Ostrom's research focuses on helping users manage common-pool resources such as water. [122,1,1]
17. B Gross Domestic Product per capita is equal to the product of Gross Domestic Product per worker and labor force participation rate. [79,1,1]
18. C Positive economics describes and explains economic phenomena and makes predictions about what will happen under particular circumstances. It focuses on identifying and measuring cause-and-effect relationships. [8,1,1]
19. A Capital goods, like factory buildings, help produce other goods and services. However, unlike intermediate goods, they are not used up in the production process. [70,1,0]
20. E The Antofagasta Region in Chile has high water demand because of its role as the world's largest copper producer. [123,1,2]
21. B In 2014, Flint, Michigan, changed its drinking water system to save money. The change resulted in a severe degradation of water quality standards. [126,3,1]
22. A Price elasticity of demand is equal to the percentage change in quantity demanded divided by the percentage change in price. Thus, if the elasticity equals 0.2 and the price increases by 20%, the quantity demanded will fall by 0.2 times 20%, or 4%. [25,1,5]
23. D Bank runs, which occur when depositors collectively suddenly want to withdraw large portions of money, historically posed a major challenge to the financial system but are not common in the modern era. Bank runs are possible because fractional reserve banking allows banks to only hold a portion of their liabilities as reserves. [91,2,2; 92,1,0; 92,1,1]

24. A Gross Domestic Product Deflator is equal to 100 times the ratio of nominal Gross Domestic Product to Real Gross Domestic Product. [74,2,1]
25. D The nationwide drought constitutes a negative aggregate supply shock that decreases aggregate supply, and improved consumer sentiment will increase consumption and thus aggregate demand. Increasing aggregate demand and decreasing aggregate supply will shift the aggregate demand curve to the right and the short-run aggregate supply curve to the left, placing the new equilibrium above the previous equilibrium, signifying an increase in the price level. Depending on the size of the shifts, the new equilibrium point may be to the right of, to the left of, or in the same horizontal place as the previous equilibrium, so the new output level cannot be determined. [104,2,3; 104,2,4; 102,2,2; 102,2,3; 104,1,1]
26. A Financially-stable borrowers can charge relatively low interest rates, as they do not need to compensate lenders for assuming the risk that they will default on their obligation. [81,2,3]
27. B If more consumers enter the market for chairs, the demand curve will shift right. The new equilibrium point will be located above and to the right of the previous equilibrium, signifying an increase in both equilibrium price and quantity. [23,1,1; 23,2,0; 23,2,1; 25,1,1; 14,2,1]
28. C In a closed economy, $Y - C - G$ represents the economy's total income minus consumer and government spending, thus yielding national savings S . Using the definition of Gross Domestic Product $Y = C + G + I + NX$ and remembering that net exports NX must be zero in the closed economy, one can determine that $Y - C - G = I$. Thus, $S = I$. [83,1,3]
29. D A country's net capital outflow is equal to the purchase of foreign assets by that country's residents minus the purchase of domestic assets by foreigners. Thus, Amazon's purchase of a factory overseas would increase the United States' net capital outflow. [83,2,4; 83,2,5]
30. A Because Country A's labor force participation rate is 40% and its population is 700 million, it has 280 million people in its labor force. 252 million are unemployed, yielding an unemployment rate of 90%. [74,2,6; 75,2,1 75,2,2]
31. B Australia, Chile, and the United States have used markets to allocate water among users. [122,2,2]
32. C The equilibrium point is located at the intersection of the market supply and demand curves. At this point, the quantity supplied must equal the quantity demanded; thus, to find the market equilibrium price, one must set Q_D equal to Q_S and solve for P . Then, one can substitute the numerical value of P into either one of the provided equations to solve for the equilibrium quantity. [15,2,6]
33. B Price elasticity of demand is not constant at all points on a demand curve. As one moves from left to right along the curve, the price elasticity of demand falls. [26,1,1]
34. C Grandfathering is the practice of determining historic polluting behavior. This baselining helps establish a cap-and-trade market. [127,1,2]
35. A Household purchases are also called consumption expenditures and represent one of the four categories of expenditures included in Gross Domestic Product. [71,1,1]
36. A During the 1970s, the national inflation rate in the United States reached double digits. Inflation was a significant economic challenge despite the long-run neutrality of money. [95,1,1]
37. E Economic models are usually diagrams or mathematical formulas. [7,2,5]
38. D The Federal Reserve engages in open market operations by selling or buying United States government bonds. It sells government bonds to shrink the money supply and buys bonds to expand the money supply. Though raising the reserve requirement and discount rate would also decrease the money supply, they are not open market operations. [89,2,1]
39. A Money functions as a medium of exchange by facilitating the purchase of goods and services by consumers like Gibran. [87,2,2]
40. C If, in the aggregate, citizens save more money, the supply of savings will increase, shifting the supply curve to the right. Consequently, the new equilibrium point is below and to the right of the previous equilibrium point, lowering the real interest rate but increasing the equilibrium level of saving and investment in the economy. [87,1,3; 25,1,2]
41. C Pigouvian taxes require firms to pay a tax per unit of pollution emitted, and they increase the cost of production. [124,2,2]
42. D Private mitigation banks (PMB) generate credits for sale by restoring or preserving water bodies. [128,1,3]
43. E Created by economist Arthur Okun, Okun's Law holds that a one percent deviation in the unemployment rate from the natural rate of unemployment corresponds to a two percent deviation in the output gap. [100,1,0]
44. E The market demand curve depicts the relationship between quantity demanded and price. [13,2,1]
45. A Even though no one entity coordinates production in the American economy, a chain of self-interested individual choices results in a wide range of goods and services available to consumers. [6,2,0]

46. D Increases in aggregate demand—which consists of consumption, investment, government purchases, and net exports—shift the aggregate demand curve to the right. Because business spending on machinery contributes to investment, aggregate demand will increase, and the aggregate demand curve will shift to the right. [101,1,5; 102,2,1]
47. C A decrease in demand causes the market demand curve to shift to the left. Teleportation and bus rides are substitutes. [13,2,2]
48. E One calculates Consumer Price Index by taking the ratio of the cost of a consumption bundle in the current year by the cost of the bundle in the base year and multiplying this ratio by 100. In this case, the consumption bundle costs \$250 in the base year and \$350 in 2020, yielding a Consumer Price Index of 140. [73,1,1]
49. A A change in the number of buyers in a market can shift the demand curve. If, for example, more consumers enter the market for plates, one can expect the demand for plates to increase and the curve to shift to the right. [14,2,1]
50. D Intermediate goods are used in the production of final goods sold to consumers, and they are not included in Gross Domestic Product. [68,1,1; 68,2,0]

1. C Trade benefits both parties as long as it is voluntary, even if one actor is economically stronger than the other. [7,2,2]
2. B In an economy with price level P, \$1 can buy $1/P$ worth of goods and services. [92,1,4]
3. E The change to the Flint water system resulted in lead exposure for its residents. This change was intended to save \$5 million. [126,3,1]
4. E Consumer surplus represents the surplus value consumers receive and occurs when consumers' willingness to pay exceeds the market price. Total consumer surplus is found by adding the difference between the market price and the willingness to pay of every consumer who buys the good or service. In this example, all three buyers contribute to consumer surplus, as they all receive a surplus benefit from their purchases. [20,1,5; 20,2,0]
5. C In order to control Great Lakes invasive species, chemicals have been released to kill off populations. [126,1,1]
6. D Gross Domestic Product Deflator is equal to 100 times the ratio of nominal Gross Domestic Product to Real Gross Domestic Product. [74,2,1]
7. B If consumers leave the market for fax machines, the demand curve will shift left. The new equilibrium point will be located below and to the left of the previous equilibrium, signifying a decrease in both equilibrium price and quantity. [23,1,1; 23,2,0; 23,2,1; 25,1,1; 14,2,1]
8. B Applications to transfer water rights include the type of water right and the amount of water involved. [122,2,2]
9. B When supply shifts right, equilibrium price falls. When demand shifts left, equilibrium price falls. [15,2,4]
10. E A market is perfectly competitive if the good or service being bought or sold is highly standardized, the number of buyers and sellers is large, and all participants are well informed about the market price. [11,1,1]
11. C The efficient level of production occurs at a point where marginal social costs equal demand. This level experiences economic production and some water pollution. [123,2,2]
12. D Instream trading is active in many Western states such as Oregon. [123,1,1]
13. D Intermediate goods are used in the production of final goods sold to consumers, and they are not included in Gross Domestic Product. [68,1,1; 68,2,0]
14. A Though the unemployment rate generally falls during expansions, it can never reach zero, as there are always people looking for work or switching jobs. [65,1,1]
15. E A change in the number of sellers in a market can shift the supply curve. In this case, because there are fewer suppliers in the market, the supply of backpacks will fall and the supply curve will shift to the left. [15,2,3]
16. A Prescriptive regulations entail the regulator to determine which firms can pollute and the overall permissible amount. An agency setting a pollution quota is an example of a prescriptive regulation. [124,2,2]
17. B The law of supply outlines a positive relationship between a good's price and the quantity of it producers supply. If the price of computers increases, producers will want to supply more computers, and so the quantity supplied of computers will increase. [14,2,2]
18. D Frictional unemployment occurs when workers are transitioning from one job to another or when they are first entering the workforce. [76,2,0]
19. A Normal goods experience an increase in quantity demanded as income rises. [13,2,4]
20. E Gross Domestic Product per capita is equal to the product of Gross Domestic Product per worker and labor force participation rate. [79,1,1]
21. E Price elasticity of supply is equal to the percentage change in quantity supplied divided by the percentage change in price. Thus, if the elasticity equals 0.9 and the price increases by 50%, the quantity demanded will increase by 0.9 times 50%, or 45%. [26,1,4]
22. D Los Angeles reduced its diversions from Mono Lake because of litigation regarding minimum water delivery needed to preserve the lake. [121,1,1]
23. A Assets are liquid if they can easily be converted into an economy's medium of exchange—usually currency. It is relatively difficult for real estate owners to sell their properties in exchange for cash—compared to, say, selling a mutual fund share—and thus real estate is the least liquid of the given assets. [88,1,1]
24. C In a closed economy, $Y - C - G$ represents the economy's total income minus consumer and government spending, thus yielding national savings. [83,1,3]
25. C Under the Clean Water Act, approximately \$1 trillion has been invested in water pollution abatement. However, more than half of all streams in the United States do not satisfy pollution standards. [125,1,1]
26. C Microeconomics concentrates on individual behavior and the operation of particular markets. [9,1,1]

27. E Increases in aggregate demand—which consists of consumption, investment, government purchases, and net exports—shift the aggregate demand curve to the right. Because consumer spending on clothing contributes to consumption, aggregate demand will decrease, and the aggregate demand curve will shift to the left. [101,1,4; 102,2,1]
28. D Pareto efficiency can apply to many distributions of the same situation. Normative judgments can determine which distribution is the most socially optimal. [8,2,3]
29. D When consumers' income rises, they demand less of inferior goods. As consumers become wealthier, they will likely, on average, buy ramen noodles less frequently, making ramen noodles an inferior good. [13,2,4]
30. E The reduction in oil prices constitutes a positive supply shock that increases aggregate supply, and firms' hesitancy to take on capital projects lowers investment and thus aggregate demand. Decreasing aggregate demand and increasing aggregate supply will shift the aggregate demand curve to the left and the short-run aggregate supply curve to the right, placing the new equilibrium below the previous equilibrium, signifying a decrease in the price level. Depending on the size of the shifts, the new equilibrium point may be to the right of, to the left of, or in the same horizontal place as the previous equilibrium, so the new output level cannot be determined. [104,2,3; 104,2,4; 102,2,2; 102,2,3; 104,1,1]
31. D Real Gross Domestic Product measures an economy's total quantity of goods and services and, unlike nominal GDP, accounts for inflation. [61,2,3]
32. C The selling of bonds is known as debt finance, while the selling of stock shares is known as equity finance. [81,2,4]
33. C The Federal Reserve engages in open market operations by selling or buying United States government bonds. It sells government bonds to shrink the money supply and buys bonds to expand the money supply. [89,2,1]
34. A Human desires are insatiable, while all resources are scarce. [7,1,0]
35. B Price elasticity of demand is equal to the percentage change in quantity demanded divided by the percentage change in price. Thus, if the elasticity equals 1.2 and the price increases by 30%, the quantity demanded will fall by 1.2 times 30%, or 36%. [25,1,5]
36. A The business cycle describes the pattern of expansions—periods of economic growth—and recessions—periods of economic decline in an economy. [96,2,1]
37. C Using the expenditures method, Gross Domestic Product equals the sum of consumer spending, investment, government spending, and net exports—exports minus imports. [71,2,4]
38. E Common law relies on established precedent. It was developed in England. [119,2,1]
39. E Households purchase consumer nondurables like clothing or food. These goods have a short lifespan and are considered consumption expenditures. [71,1,1]
40. B In economics, the “short run” is the period of time during which the economy deviates from its long-run potential. Based on past economic data, the “short run” is roughly between 1 and 3 years. [107,1,1; 107,2,0]
41. E One calculates Consumer Price Index by taking the ratio of the cost of a consumption bundle in the current year by the cost of the bundle in the base year and multiplying this ratio by 100. In this case, the consumption bundle costs \$600 in the base year and \$1,200 in 2020, yielding a Consumer Price Index of 200. [73,1,1]
42. B Capital goods, like machinery, help produce other goods and services. However, unlike intermediate goods, they are not used up in the production process. [70,1,0]
43. C A country's net capital outflow is equal to the purchase of foreign assets by that country's residents minus the purchase of domestic assets by foreigners. Thus, General Motors' purchase of \$80 million of foreign assets will increase the United States' net capital outflow by \$80 million. Moreover, in an open economy, net capital outflow is equivalent to net exports. Because net exports is one of the factors contributing to Gross Domestic Product under the expenditures method, increasing net exports by \$80 million will also increase Gross Domestic Product by \$80 million. [83,2,4; 84,1,1; 71,2,4]
44. C In a nutrient credit market, firms earn credits through improving water quality or investing in preservation. [127,1,1]
45. E BGH technology decreases farm income overall, yet individual farmers cannot influence market prices nor control whether other farmers adopt the technology. At an individual level, farmers can increase their income by adopting BGH, even though their income would be higher if no one in the industry adopted BGH. [29,1,2]
46. E Created by economist Arthur Okun, Okun's Law holds that a one percent deviation in the unemployment rate from the natural rate of unemployment corresponds to a two percent deviation in the output gap. In this case, the natural rate of unemployment is 4 percent. When the unemployment rate increases to 20 percent—all of this increase caused by the recession—cyclical unemployment equals 16 percent, and thus the output gap will be 32 percent. [100,1,0; 77,1,1]

47. B An economic outcome is Pareto-efficient if no person can be made better off without detracting from another person's well-being—even if wealth is not distributed equally. [8.2,1; 8.2,2]
48. C If, in the aggregate, citizens save less money, the supply of savings will decrease, shifting the supply curve to the left. Consequently, the new equilibrium point is above and to the left of the previous equilibrium point, raising the real interest rate but decreasing the equilibrium level of saving and investment in the economy. [87.1,3; 25.1,2]
49. A The gasoline market is closest to perfect competition, as there are many buyers and sellers, neither of whom can individually determine the price of gasoline. [12.1,0]
50. A The equilibrium point is located at the intersection of the market supply and demand curves. At this point, the quantity supplied must equal the quantity demanded; thus, to find the market equilibrium price, one must set Q_D equal to Q_S and solve for P. Then, one can substitute the numerical value of P into either one of the provided equations to solve for the equilibrium quantity. [15.2,6]

1. C A market with only a few sellers is an oligopoly. Oligopolies with members that cooperate and behave like a monopoly is called a cartel. [48,2,1]
2. E Public goods are both non-rival and non-excludable. National defense is a public good. [57,1,0]
3. D When the lower price of one good causes demand for another good to increase, those two goods are complements. Bicycles and helmets are complements. [14,1,1]
4. A If economic profits fall below zero in a perfectly competitive market, then some sellers will leave the market and find better opportunities elsewhere. [43,2,2]
5. C By estimating the elasticity of demand, economists can understand the relationships between water price and quantity consumed. [116,2,0]
6. A The Federal Open Market Committee controls the money supply through the use of open market operations. [91,2,3]
7. D The opportunity cost of a choice is the value of the next-best option, so a plausible opportunity cost of buying a hamburger is the salad you would have otherwise bought. [7,1,2]
8. B The consumer surplus is the surplus value that consumers receive. Adam and Magnus would have been willing to pay an extra \$6 combined but do not have to, so this surplus value is their consumer surplus. [20,2,2]
9. D Over time, labor income has risen due to higher productivity, in turn from higher average education levels. Technology is a more important driver in the future since education has sharp diminishing returns to scale at the graduate and postgraduate level. [81,2,2;82,1,0]
10. C Economic profits equal revenue minus explicit costs minus opportunity cost. $2000 - (50+400+500) - (200) = 850$. [41,2,1]
11. C The unemployment rate is the percentage of the labor force that would like to work but cannot find employment. The labor force is made of individuals who are employed or unemployed. If someone is not looking for a job or employed, they are not in the labor force. [66,2,2]
12. C The supply of ancient vases is perfectly inelastic. There are no more ancient vases being produced, so quantity supplied has no influence on price. [26,2,7]
13. B Entrepreneurs can get around the barriers created by monopolies by inventing a new product. The government manages monopolies with anti-trust laws, public ownership, and regulation. [49,2,2]
14. C Economists use GDP to isolate the effects of changes in the physical quantity of production from changes in price (inflation.) [74,2,2]
15. C Irrigation districts address organizational challenges by electing boards to manage complex allocation issues. [118,2,0]
16. D If sellers expect higher prices in the future, they cut back on current supply so that they can sell more product at the higher price later on. [15,2,3]
17. E Goods and services improve over time due to technological change. As such, these goods become more expensive over time. The CPI will overstate the increased price of these goods even though the goods are improving. [75,2,5]
18. D It takes three months to calculate the first estimates of GDP, and those estimates are revised frequently over the next few months. [112,1,4]
19. B The less elastic the supply and demand curves are, the smaller the effect of the tax on the equilibrium quantity and the lower the deadweight loss of the tax. [36,1,0]
20. E Economists discuss water quantity as water allocation. Water quantity markets refer to the transfer of water between uses and sectors. [113,1,1]
21. D The concept of appropriative rights requires that water is put into beneficial use. Riparian rights system base their decisions on this concept. [120,2,2]
22. D If the government reduces saving, the supply of saving is reduced at every interest rate. The supply of savings shifts left. Interest rates are higher and investment is lower. The tendency of government deficits to reduce private investment is called crowding out. [88,1,0]
23. B According to Adam Smith, diamonds are valuable because they are scarce rather than useful. [111,1,3]
24. D Substitutes have high price elasticities of demand because it is easy for consumers to switch from one product to another. [25,2,7]
25. A The allocation of scarce resources – efficiency -- is key to evaluating a society’s economy. An efficient economy is a key first step to improving the allocation of resources and thus improving the economy. [8,2,4]
26. E Positive economics describes and explains economic phenomena and does not require a value judgement. Normative economics uses value judgments to analyze what *should* be done. [8,1,2]
27. A The Hohokam built an extensive waterway system in the fifteenth century. It included 850 miles of waterways. [117,1,2]
28. C An increasing block rate water schedule charges users more as they consume more water. [115,2,2]
29. A Logrolling leads to wasteful government spending, as does rent seeking, which is a socially unproductive activity that directs economic benefits to one group instead of another. [60,1,2]

30. B Nigeria has the lowest output per capita of the answer choices listed. With the US as an index of 100, Nigeria's GDP per capita is 2.5. [65,1,0]
31. C The neutrality of money means that changes in the quantity of money have no effect on real quantities in the economy. Monetary changes only affect nominal quantities. Real quantities are things that are measured in physical units and are unaffected by changes in the money supply. [97,1,1]
32. B Because Pippin can make 30 quivers in one hour and Merry can only make 17, Pippin has a comparative advantage in the production of quivers. [39,1,2]
33. E An activity that generates an externality has a positive value and the cost of reducing this activity entirely outweighs any additional benefits of reducing the externality. [51,2,1]
34. C There are four categories of economic water user groups: environmental, agricultural, urban, and industrial. [112,1,2]
35. A Pareto efficiency maximizes overall well-being but does not dictate how wealth should be distributed, which is a normative economic judgement. [8,2,3; 8,2,4]
36. C If the government reduces the capital tax on office space, office space becomes cheaper and the price level will fall while real output rises as most firms will see their fixed input costs fall. [106,2,1;110,2,3]
37. B When a country's exports exceed imports, that country is running a trade surplus. It is sending out more than it is taking in. [71,1,2]
38. B While the Fed has the power to set reserve requirements, this action is disruptive to the business of banking. Therefore, the Fed only rarely changes reserve requirements. [93,2,5]
39. E Capital goods are used to produce other goods and services but are not themselves used up in production. Machinery and factory buildings are capital goods. [72,1,2]
40. E In the short run, many firms do not immediately adjust prices. They fix prices for a certain period of time and sell as much as they can, then gradually adjust their prices. [106,2,3]
41. E When two parties specialize in different areas, trade between them allows both actors to mutually benefit. [7,2,2]
42. A The South-North Water Transfer Project redirects water from the Yangtze River to the Yellow River in China. [113,3,2]
43. E When real GDP declines for two consecutive quarters (six months), then a recession occurs. [99,1,3]
44. A A market is perfectly competitive if the good or service is highly standardized, the number of buyers and sellers is large, all participants are aware of the market price, and no one buyer or seller can influence the market price. [11,1/2,1]
45. A Part of the consumer surplus is transferred to the monopoly. Consumers would have been able to pay a lower price without the monopoly, but the monopoly can choose its prices and overcharges customers to gain revenue. [47,1,1]
46. B Equilibrium is the combination of price and quantity at which the market settles. Equilibrium is the point at which all the forces at work in a system are balanced by other forces. [15,2,6]
47. D The government's monopoly on the legal use of force is used to compel military service, restrain criminals, protect national security, and collect taxes. [59,1,0]
48. B Inferior goods get more demand when income falls. Normal goods get more demand when income rises. [13,2,4]
49. E Natural monopolies occur when a single firm can supply the market at a lower cost than two or more firms. [45,1,2]
50. E Property rights address the tragedy of the commons as it places maintenance responsibility on specific individuals. [119,2,2]

1. A The material resources created by high levels of production encourage longer life, access to education, better healthcare, and a cleaner environment. [63,2,1]
2. E A decrease in Jolly Roger's supply causes the supply curve to shift left. The resulting equilibrium point is above and to the left of the previous market equilibrium point. [42,1,1-4]
3. C Producer surplus equals the difference between market price and a seller's opportunity cost. $(50-20)+(40-20) = 50$. [18,2,2]
4. B The Fed can adjust the discount rate, the interest rate that the Fed charges on loans it makes to other banks. [93,1,3]
5. A There is an inverse relationship between the price of bonds and the rate of return – bonds are sold at a discount from face value, and this discount reflects the rate of return. Investors will hold cash if they think interest rates will rise and hold bonds if they expect interest rates to fall in the future. [81,2,1-2]
6. B Goods with a higher market price contribute more to GDP. A used car does not count in the current period of time to calculate GDP. [68,1,1]
7. B Water price increases can be caused when water is exported to other markets at a higher price. Exportation could lead to third-party challenges given the impact on the local community. [122,1,2]
8. D If sellers expect prices to rise in the future, they may reduce quantity and store up their inventories in expectation of higher future prices. [15,2,2]
9. C Because the supply curve is upward sloping and the demand curve is downward sloping, they intersect in one point. That point is market equilibrium. [18,Figure 6]
10. C The Great Salt Lake is in Utah. Mormon settlers developed advance irrigation in the area. [121,1,0]
11. C When a price floor is created, suppliers want to sell at lower prices but are prevented from doing so because of the minimum price established. Thus, consumers do not buy as much product and a surplus of supply is created. [32,2,1]
12. A Legislators' trading votes to support each other's pet projects is called logrolling. [58,2,4]
13. A The opportunity cost of a choice is the value of the next-best option and is often different from the monetary cost associated with the decision. [7,1,2]
14. B Currencies are a highly competitive homogenous good, with prices that are updated frequently and easily accessible to the buyers, many buyers and sellers, and a high degree of standardization. [10,2,1-11,1,1]
15. E The Hoover Dam played a key role in expanding agriculture in arid areas of the Western United States. [118,3,1]
16. A The US Bureau of Labor Statistics calculates CPI each month. [72,2,2]
17. B The government can compel citizens to not act in their self-interest, like paying taxes. The government has a monopoly on the legal use of force and enforces contractual obligations. [57,1,1-3]
18. E It is easier to enter and exit the online clothing store market than the department store clothing market. Thus, supply will be more elastic. [26,1,5]
19. E In a cap-and-trade system, high MAC (marginal abatement costs) firms are better suited to purchase pollution permits. [127,1,2]
20. C Microeconomics and macroeconomics both share common assumptions about the basic features of human behavior (e.g. rationality, etc.) [9,1,2]
21. D Effective prescriptive regulations require the regulator to understand how firms operate. This knowledge will allow them to set standards that will impact the market. [124,2,2]
22. E Variable costs can be changed in the short run. For example, the cost of labor and materials are variable costs. [42,1,3]
23. B Positive economists analyze cause-and-effect relationships and measure their size. They make value-free judgments. [8,1,1]
24. E Setting excessive water quality standards may result in high costs for consumers and divert infrastructure investment from other areas. [126,2,0]
25. D Financially shaky corporations must pay high interest rates when they issue bonds. [81,2,3]
26. C The American rate of inflation was high during the First and Second World Wars and again in the 1970s, but it has been quite low since the early 1980s. [68,Figure 36]
27. C Predatorial species such as salmon have been introduced to the Great Lakes to reduce the invasive alewife population. [126,1,1]
28. D An externality happens when the actions of one person affect the well-being of someone else, but neither party pays for nor is paid by these actions. When the action is harmful, it is a negative externality. [50,1,4]
29. A Entrepreneurs are motivated by the economic profits they can earn by being the first to market a new product. [49,1,4]
30. E When output is below potential output, unemployment rises. Arthur Okun noted the relationship between the output gap and cyclical unemployment. [99,2,2]
31. B The Coase Theorem states that as long as parties can negotiate with each other, the private market should be able to resolve inefficiencies created by externalities. [51,1,4]

32. A When the Federal Reserve injects money into the economy, the demand for goods and services increases. But the supply of goods and services has not changed. Thus, demand rises and supply stays the same. [89,2,1]
33. B The government in the UK used a tax to address the negative externality of traffic congestion in London, England in 2003. [53,1,2]
34. D Imperfect competition occurs in markets with one or a few sellers. Examples include monopolies, oligopolies, and monopolistic competition. [43-44]
35. A Advanced irrigation development occurred in Colorado and California in the late nineteenth century. [118,1,0]
36. C Portfolio investment occurs when an individual or business purchases shares of stock or bonds issued by a foreign corporation. [83,2,5]
37. E If all of a country's output were dedicated to investment, there would be no goods or services to consume. Left unchecked, the population would starve. Diminishing returns to scale would make it undesirable to keep investing. [83,1,1]
38. E Economic models are usually simplistic and seek to capture only the most essential aspects of the phenomenon being studied. [7,2,4]
39. E Profits are the difference between a firm's total revenue and total costs. [42,2,3]
40. E Collective goods are often natural monopolies because they are not rival in consumption. The marginal cost of producing them is zero or close to zero. [56,2,3]
41. B When the aggregate price level falls, people will be able to purchase more goods and their level of spending increases. The aggregate demand curve shifts right. [102,2,3]
42. E The principle of comparative advantage states that specialization and trade benefit parties if and only if they have different opportunity costs of production and therefore comparative advantage. However, trade will not provide a net benefit if there are high transaction costs – for example, they need to pay to ship the good. [34,2,3]
43. E John Maynard Keynes' *The General theory of Employment, Interest, and Money* described short-run fluctuations as a result of the interaction between the aggregate demand and short-run aggregate supply curve. [101,1,4]
44. E If prices adjusted automatically to balance supply and demand in all markets, actual output would not deviate from potential output. Therefore, the economy's resources would always be fully employed. Short-run fluctuations result from the short-run inflexibility of prices. [100,1,1]
45. E Microeconomics focuses on individual markets, so a question about the housing market is very relevant to microeconomics. [9,1,1]
46. E Pizza and pay-per-view movies both have high excludability. Pizza is a private good and pay-per-view movies are collective goods. [55,1,2]
47. A Demand for funds increases, shifting the demand curve right. The new equilibrium occurs at a higher interest rate and a higher level of savings and investment. [88,1,1]
48. B In North Carolina water quality trading markets, polluters can trade nutrient allocations for phosphorus and nitrogen. [128,1,2]
49. E The Zooville example demonstrates a typical approach for riparian rights system for water shortages. Individuals with earliest ("first-come") claims on the water will receive water first. [120,2,0]
50. A Milk, medication, gasoline, and bread are all necessities and thus have a low elasticity of demand. Because there are many types of potato chips and potato chips are only one type of snack in the broader snack market, they have a higher elasticity of demand. [25,2,3]

1. D In a closed economy, national savings is equal to the sum of private savings—Gross Domestic Product minus consumer spending and taxes—and government saving—net taxes minus government spending. In this example, private savings is equal to \$20 billion; thus, government saving is equal to \$50 billion, meaning that the government is running a \$50 billion budget surplus. [83,1,5]
2. C Price elasticity of supply equals percentage change in quantity supplied divided by percentage change in price. $75/50 = 1.5$. [26,2,2]
3. A Peanut butter and cookie butter are substitutes. When a decline in the price of one good causes a reduction in the quantity demanded of another, those goods are substitutes. [14,1,0]
4. E Public transportation is an inferior good, and as consumers' incomes rise, they will demand less of it, shifting the demand curve to the left. The new equilibrium point will be located below and to the left of the previous equilibrium, signifying a decrease in both equilibrium price and quantity. [23,1,1; 23,2,0; 23,2,1; 25,1,1; 13,2,5]
5. B Price elasticity of supply can be low if the producers are close to full capacity or a key intermediate input has inelastic supply, so that the producers cannot easily increase output. [26,2,1-3]
6. E A third party can stop a water rights transfer in the United States by arguing that the transfer will impair water access for the local community. [122,2,3]
7. C A perfectly elastic demand curve is completely flat, while a perfectly inelastic demand curve is completely horizontal. [26,1,2]
8. A The equilibrium point is located at the intersection of the market supply and demand curves. At this point, the quantity supplied must equal the quantity demanded; thus, to find the market equilibrium price, one must set Q_D equal to Q_S and solve for P. In this case, the equilibrium price is \$20. Since the market price is higher than the equilibrium price, there will be more suppliers who want to sell the good than there are consumers who want to buy it, resulting in excess supply. [15,2,6; 18,2,2; 18,1,1]
9. B Money functions as a medium of exchange by facilitating the purchase of goods and services by consumers like Mikayla. [87,2,2]
10. B When a country exports less than it imports, that country is in a trade deficit. [66,1,2]
11. D Binding price floors, like those set by the government to support farmers, create excess supply. Because the market price is above the equilibrium price, the quantity supplied is greater than the quantity demanded. [33,1,0]
12. E Substitution bias, unmeasured quality change, and the introduction of new goods and services contribute to the Consumer Price Index's overstatement of the true increase in the cost of living. Gross Domestic Product Deflator, by contrast, does not overstate the true cost of living as much. [73,2,2; 74,1,1; 74,1,2]
13. C Fiscal policy—which includes changes to the tax rates and changes to government spending—is one tool governments can use to stabilize or stimulate the economy during recessions. Specifically, lowering taxes is an example of expansionary—as opposed to contractionary—fiscal policy, as it aims to fuel economic growth. [108,2,1; 108,2,2]
14. C Cyclical unemployment occurs during recessions, usually because demand for companies' products falls, and thus firms do not need as many workers. [77,1,2]
15. A Firms that seek to change the PED for their good should alter related factors, e.g. differentiating it or creating a distinct branding to reduce other goods' value as substitutes. [25,2,5; 26,1,1-3]
16. C In the market for a good or service, equilibrium occurs at the intersection of the market supply and demand curves. Because two curves can only intersect at one point, there is only one possible combination of equilibrium quantity and price. [15,2,4]
17. B An increasing block rate schedule charges users higher prices as they consume more. This schedule is also known as conservation pricing. [115,2,1]
18. A The law of demand outlines an inverse relationship between a good's price and the quantity of it consumers demand. Decreasing the price of tables would therefore lower the quantity of tables consumers demand. [12,2,1]
19. A Oregon is notable for enacting instream trading, which includes the social and ecosystem related aspects of water use. [123,1,1]
20. C Typically, the wage-earning job a student forgoes—the opportunity cost of their choosing to attend college—is the most expensive cost of college. [7,1,3]
21. E Commodity money—like gold or silver—has intrinsic value, whereas fiat money—like the United States dollar or Japanese Yen—does not. [88,1,2]
22. B Financially-shaky borrowers must charge relatively high interest rates to compensate lenders for assuming the risk that they will default on their obligation. Moreover, bonds with longer maturities also present the risk of potential future changes in price, so borrowers have to pay lenders a higher interest rate to account for that additional risk. [81,2,2; 81,2,3]

23. A If an economy is producing its potential output, its unemployment rate is equal to the natural rate of unemployment, the sum of frictional and structural employment. Critically, there is no cyclical employment in the natural rate of unemployment. [98,2,1; 99,2,1]
24. E Gross Domestic Product measures economic output during a specified period of time, usually one year or quarter. [70,1,2]
25. D The money multiplier describes the value the banking sector generates with each dollar of reserves and is the reciprocal of the reserve ratio. If the reserve ratio is 0.20, the money multiplier must thus be 5. [90,2,3]
26. D Unlike normative economics, positive economics is value free. [8,1,1]
27. A One can calculate real Gross Domestic Product by multiplying the quantity of each good sold by that good's price in the base year. In this example, one would multiply 500 sweatshirts by their 2000 price of \$30 and multiply 40 computers by their 2000 price of \$50. Then, one should sum the market value of all goods in the economy, which in this example means only sweatshirts and computers. [72,2,0]
28. A In economics, investment spending describes the purchase of capital goods, like factories and machinery; new homes; and inventories. [71,1,2]
29. D Surface water systems provide most of the freshwater withdrawals in the United States. [112,2,2]
30. E Economic profit at equilibrium is the same in monopolistic competition and perfect competition. In monopolistic competition, barriers to entry are low and this forces down economic profit. [49,2,1]
31. E Gross Domestic Product measures the market value of all final goods and services and excludes intermediate goods, which are used in the production of final goods sold to consumers. The apple picking tickets and apples Jada sells as final goods to consumers thus contribute to Gross Domestic Product, but the apples she sells to the local bakery do not. Instead, the final sale of the bakery's apple pies to consumers captures the value of the apples Jada sold them. [68,2,0]
32. D Diversions in the Aral Sea watershed have led to salinity increases and a reduction between 74 and 90% of the original lake area. [120,3,2]
33. B Macroeconomics focuses on the overall national economy, while microeconomics concentrates on individual markets, firms, and individuals, making it smaller in scope. [9,1,1]
34. B Ketchup is a complement to hot dogs, as both goods are frequently consumed together. As the price of hot dogs increases, one can expect the quantity demanded of hamburgers to fall. [14,1,0]
35. A COVID-19 and the resultant lockdowns drastically changed the consumer sentiment and made it harder for consumers to purchase goods and services, thus reducing aggregate demand and shifting the aggregate curve leftward. [102,2,2]
36. B A worker on vacation is considered employed, as is someone who worked part- or full-time within the previous week. [75,1,1]
37. E The mean elasticity of urban water demand is -0.41, which suggests that consumers are unresponsive to the price of water. [116,2,0]
38. B The South-North Water Transfer Project is based in China. It transfers water from the Yangtze to the Yellow River. [113,3,2]
39. B Market failure occurs when a good or service is not allocated efficiently. The example of low water quality demonstrates this problem as the water cannot be consumed. [111,2,1]
40. A Though the United States' population has grown by a factor of over four since 1900, productivity increases have resulted in a real Gross Domestic Product nearly 8 times what it was in 1900. [62,1,1]
41. E Decreasing aggregate supply will shift the short-run aggregate supply curve to the left, placing the new equilibrium point above and to the left of the previous equilibrium. Consequently, output decreases while the price level rises. [104,2,3; 104,2,4]
42. D Created by economist Arthur Okun, Okun's Law holds that a one percent deviation in the unemployment rate from the natural rate of unemployment corresponds to a two percent deviation in the output gap. In this case, the natural rate of unemployment is 9 percent. When the unemployment rate increases to 30 percent—all of this increase caused by the recession—cyclical unemployment equals 21 percent, and thus the output gap will be 42 percent. [100,1,0; 77,1,1]
43. E Benevolent social planners aim to maximize total surplus—the sum of consumer surplus and producer surplus. [20,2,3]
44. A Monopolies often work to manage water supplies because they can benefit from economies of scale. This concept states that the marginal cost of production decreases as production increases. [114,1,1]
45. A If suppliers can more easily enter the market for chairs, supply will become more elastic. This increase in elasticity is reflected in a supply curve that becomes more horizontal. [26,1,6; 26,2,3]
46. A Henry Ford's moving assembly line is an example of technological knowledge. Improved technological knowledge has historically raised average labor productivity more than developments in any other factor influencing labor productivity. [80,1,4]

47. A The law of supply outlines a positive relationship between a good's price and the quantity of it producers supply. If the price of chips falls, producers will want to supply less, and so the quantity supplied of chips will decrease. [14,2,2]
48. B The interest rate serves as the price of a loan in the financial market and is determined, as in the markets for other goods and services, by the interaction between the supply and demand curves in the market. [84,2,4]
49. A Riparian right systems will not define specific water allocation amounts. They define the seniority of individuals that claim water access. [119,2,3]
50. B The velocity of money times the money supply is equal to the price level times the real Gross Domestic Product—also known as the nominal Gross Domestic Product. [94,2,2; 94,2,4]