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1. Which of the following describes why scarcity exists in an economy?

(A) There are more resources available than are being used.

(B) Society's resources are underutilized.

(C) Society's wants exceed its available resources. ✓

(D) Prices of available resources are lower than consumers' willingness to pay.

(E) Prices of available resources are higher than consumers' willingness to pay.

Answer C

Correct. Scarcity refers to the idea that individuals and societies must make choices concerning how to allocate their limited resources to address their unlimited wants.

2. Which of the following best explains the difference in resource allocation between a pure command economy and a pure market economy?

(A) A pure command economy allocates resources based on individual choices, whereas a pure market economy allocates resources using central planning.

(B) A pure command economy allocates resources to maximize profits, whereas a pure market economy allocates resources to maximize revenues.

(C) A pure command economy allocates resources using central planning, whereas a pure market economy relies on market forces to allocate resources. ✓

(D) A pure command economy allocates resources to eliminate income inequalities, whereas a pure market economy allocates resources to eliminate negative externalities.

(E) A pure command economy allocates resources to achieve allocative efficiency, whereas a pure market economy allocates resources to achieve productive efficiency.

Answer C

Correct. In a pure command economy, the government allocates resources using central planning, whereas in a pure market economy, resources are allocated based on market forces.

3. Which of the following is the best example of a fixed input for a firm producing leather boots in the short run?

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(A) Industrial sewing machines ✓
(B) Leather used to make the boots
(C) Thread used to stitch the leather together
(D) Unskilled labor working in the factory
(E) Electricity used to power the factory

Answer A

Correct. Fixed inputs are those inputs that cannot be varied in their usage in the short run. The industrial sewing machines represent a fixed input in the production of leather boots because the quantity of industrial sewing machines is fixed and does not vary with the number of leather boots produced in the short run.

4. Ming and Andreas are the only two employees at a pizza shop where they can either make pizzas or take orders. Ming has a comparative advantage over Andreas in making pizzas. Which of the following statements must be true?

(A) Ming has a higher opportunity cost for making pizzas.
(B) Ming has an absolute advantage in making pizzas.
(C) There is no advantage in specialization for Andreas.
(D) Andreas has an absolute advantage in taking orders.
(E) Andreas has a lower opportunity cost for taking orders. ✓

Answer E

Correct. A comparative advantage exists when one person has a lower opportunity cost in producing a good or service than the other person. When one person has the lower opportunity cost in producing one good or service, the other person must have the comparative advantage in producing the other good or service. Since Ming has a comparative advantage in making pizzas, Andreas must have the comparative advantage in taking orders, and therefore has a lower opportunity cost for taking orders.

5. Which of the following is true about the market supply curve for a good?

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(A) It is derived from the summation of the marginal revenue product of labor hired by individual firms.
(B) It is derived from the summation of the marginal product of labor hired by individual firms.
(C) It is derived from the summation of individual firms' quantity supplied at each price. ✓
(D) It lies above the market demand curve at quantities less than the market equilibrium quantity.
(E) It lies below the market demand curve at quantities greater than the market equilibrium quantity.

Answer C

Correct. The market supply curve for a good is derived by adding the quantity supplied by each supplier of a good at each available price.

6. Kareem is willing to pay $25 for a new remote control produced by Remotek in a perfectly competitive market. Which of the following is true if the market price of the remote control is $10?

(A) Kareem's consumer surplus is $10.
(B) Kareem's consumer surplus is $15. ✓
(C) Kareem's consumer surplus is $25.
(D) Remotek's producer surplus is $25.
(E) Remotek's producer surplus is $35.

Answer B

Correct. Consumer surplus represents the difference between what a consumer is willing to pay for a good and the market price that the consumer must pay for the good. In this example, Kareem is willing to pay $25 for a remote control but only has to pay $10, so Kareem receives $15 (= $25 − $10) in consumer surplus.

7. Discrimination in the workplace is one source of which of the following?

(A) Income and wealth inequality ✓
(B) Productive efficiency
(C) Regressive income tax systems
(D) Formation of monopolies
(E) Scarcity of resources

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Answer A

Correct. Discrimination in the workplace is one source of income and wealth inequality.

8. If a firm is experiencing increasing returns to scale, then doubling inputs will necessarily

(A) less than double total revenue
(B) less than double economic profit
(C) more than double average total cost
(D) more than double marginal cost
(E) more than double the quantity of output ✓

Answer E

Correct. Increasing returns to scale refers to a situation for a firm in which a percentage increase in the quantity of inputs results in a more than proportionate percentage increase in the quantity of output; thus, for increasing returns to scale to exist, the doubling of the quantity of inputs must result in more than double the quantity of output.

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The table shows the market supply schedule for a good.

Price ($)	Quantity Supplied
12	60
14	75
16	90
18	120

9. When the price changes from $14 to $16, the supply in this range is

(A) elastic ✓

(B) inelastic

(C) unit elastic

(D) perfectly elastic

(E) perfectly inelastic

Answer A

Correct. In this example, an increase in price from $14 to $16 resulted in an increase in quantity supplied from 75 units to 90 units. Price elasticity of supply is equal to the percentage change in the quantity supplied $\left(\frac{90-75}{75} \times 100 = 20\%\right)$ divided by the percentage change in price $\left(\frac{16-14}{14} \times 100 = 14.29\%\right)$, so the elasticity coefficient is equal to $\frac{20\%}{14.29\%} = 1.4$. Since the absolute value of the price elasticity of supply coefficient is greater than 1, supply is elastic over this range of the supply curve.

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10. If the government imposes a binding price ceiling in the gasoline market, which of the following will occur in the short run?

(A) The demand for gasoline will increase.

(B) The demand for gasoline will decrease.

(C) The quantity demanded of gasoline will increase. ✓

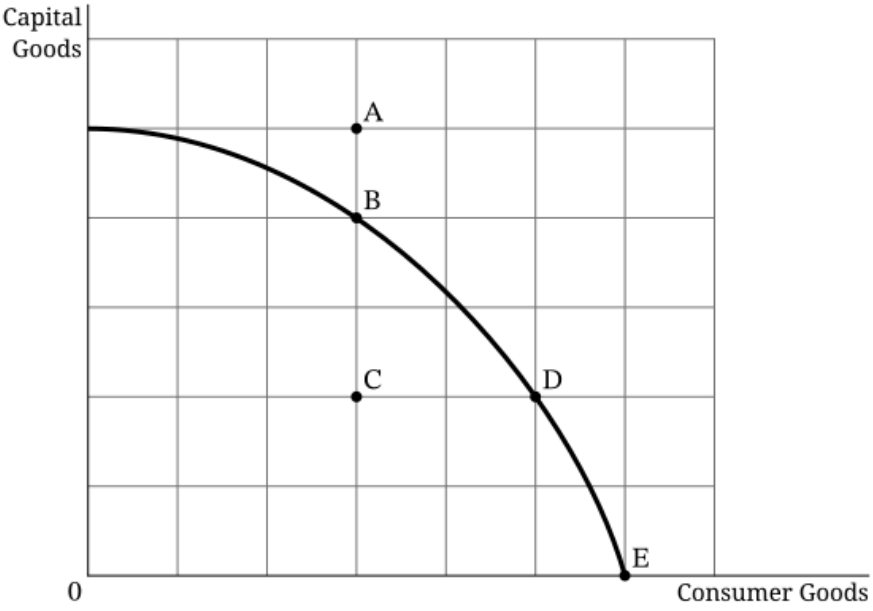
(D) All individuals in the gasoline market will be better off.

(E) All individuals in the gasoline market will be worse off.

Answer C

Correct. A binding price ceiling sets the price below the market equilibrium price, causing the quantity demanded to increase.

The graph shows a production possibilities curve for a country.



11. Assuming no change in the country's quantity and productivity of resources, the country can produce more capital goods without giving up any consumer goods if the country is currently producing at which point?

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(A) Point A
(B) Point B
(C) Point C ✓
(D) Point D
(E) Point E

Answer C

Correct. The production possibilities curve (PPC) represents the maximum quantity of capital goods and consumer goods the country is capable of producing at a given point in time and with a given quantity and productivity of resources and state of technology. At any point inside the PPC, the country is not fully utilizing its available resources; thus, at point C, the country can produce more of both goods by fully utilizing the available resources and moving to a point on the PPC.

---

12. A firm is selling its product in two separate markets. If the firm practices price discrimination, it is most likely to charge a higher price in the market that

(A) has lower marginal cost
(B) has no barriers to entry
(C) contains a binding price ceiling
(D) has fewer substitutes available ✓
(E) allows resale of the product

Answer D

Correct. A product with fewer substitutes available has a relatively less elastic demand than a product with more substitutes. With price discrimination, firms can charge higher prices when demand is less elastic and lower prices where demand is more elastic.

13. A profit-maximizing firm hiring workers from a perfectly competitive labor market will continue to hire workers until the wage rate is equal to

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(A) average variable cost
(B) average revenue
(C) marginal revenue
(D) (marginal cost) × (marginal product of labor)
(E) (marginal revenue) × (marginal product of labor) ✓

Answer E

Correct. A firm maximizes profit by hiring workers until the marginal revenue product of labor, which is (marginal revenue) × (marginal product of labor), equals the marginal factor cost. The marginal factor cost is equal to the wage rate.

The table shows the total cost schedule for a firm.

Output	Total Cost ($)
0	100
15	150
25	225

14. The average variable cost of producing 25 units of output is

(A) $4.00
(B) $5.00 ✓
(C) $7.50
(D) $9.00
(E) $10.00

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Answer B

Correct. Average variable cost is calculated by the formula $\frac{\text{Total Cost} - \text{Total Fixed Cost}}{\text{Quantity of Output}}$. In this example, total cost is $225, total fixed cost is $100, and quantity of output is 25 units; thus, average variable cost is $\frac{\$225-\$100}{25} = \$5.00$.

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15. The market for bottled mineral water is perfectly competitive. After the discovery of several new sources of mineral water, the price of bottled mineral water decreases. The substitution effect of the price decrease implies an increase in which of the following?

(A) The supply of bottled mineral water

(B) The quantity demanded of bottled mineral water ✓

(C) The demand for bottled mineral water

(D) The demand for bottled purified water, a substitute in consumption

(E) The total revenue of firms selling bottled mineral water

Answer B

Correct. The substitution effect indicates that, as the price of a good (such as bottled mineral water) decreases, consumers will substitute into greater consumption of the good, increasing the quantity demanded of the good.

16. If Aurora maximizes her total utility by spending her entire budget to purchase apples and oranges, which of the following best explains her decision making?

(A) The amount spent on apples is equal to the amount spent on oranges.

(B) The total utility received from consuming apples is equal to the total utility received from consuming oranges.

(C) The marginal utility received from consuming the last apple is equal to the marginal utility received from consuming the last orange.

(D) The marginal utility of the last dollar spent on apples is equal to the marginal utility of the last dollar spent on oranges. ✓

(E) The marginal utility received from consuming the last apple and that received from consuming the last orange are both maximized.

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Answer D

Correct. A consumer maximizes total utility when the last dollar spent on different goods gives the same marginal utility, as long as the entire budget is used. Thus, Aurora will maximize total utility by consuming the quantity at which $\frac{\text{Marginal Utility}_{\text{apples}}}{\text{Price}_{\text{apples}}} = \frac{\text{Marginal Utility}_{\text{oranges}}}{\text{Price}_{\text{oranges}}}$.

There are two barbecue restaurants in a town: Nick's Barbecue and Frank's Barbecue. The payoff matrix shows the payoffs for each combination of strategies, and both players have complete information. The first entry in each cell represents Nick's Barbecue's payoff, and the second entry represents Frank's Barbecue's payoff. Each player independently and simultaneously chooses its strategy.

		Frank's Barbecue	
		Advertise	**Not Advertise**
Nick's Barbecue	**Advertise**	\$600, \$100	\$360, \$250
	Not Advertise	\$370, \$140	\$350, \$150

17. Which of the following is true about the restaurants' dominant strategies?

(A) Nick's Barbecue's dominant strategy is Advertise, and Frank's Barbecue's dominant strategy is Advertise.

(B) Nick's Barbecue's dominant strategy is to Advertise, and Frank's Barbecue's dominant strategy is to Not Advertise. ✓

(C) Nick's Barbecue's dominant strategy is Not Advertise, and Frank's Barbecue's dominant strategy is Advertise.

(D) Nick's Barbecue's dominant strategy is to Not Advertise, and Frank's Barbecue's dominant strategy is to Not Advertise.

(E) Nick's Barbecue's dominant strategy is Advertise, and Frank's Barbecue does not have a dominant strategy.

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Answer B

Correct. A dominant strategy is one that maximizes a player's payoff regardless of the other player's choice. If Frank's Barbecue chooses to Advertise, then Nick's Barbecue will choose to Advertise because \$600 > \$370, and if Frank's Barbecue chooses to Not Advertise, then Nick's Barbecue will choose to Advertise because \$360 > \$350. Therefore, Nick's Barbecue has a dominant strategy to Advertise because it always earns more profit regardless of the action chosen by Frank's Barbecue. If Nick's Barbecue chooses to Advertise, then Frank's Barbecue will choose to Not Advertise because \$250 > \$100, and if Nick's Barbecue chooses to Not Advertise, then Frank's Barbecue will choose to Not Advertise because \$150 > \$140. Therefore, Frank's Barbecue has a dominant strategy to Not Advertise because it always earns more profit regardless of the action chosen by Nick's Barbecue.

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18. An air-conditioning unit is a normal good. Which of the following would cause an increase in the equilibrium price and equilibrium quantity of air-conditioning units in the short run?

(A) Consumers expect a greater increase in the future price of air-conditioning units. ✓

(B) Producers expect a greater increase in the future price of air-conditioning units.

(C) The price of air filters, an input in producing air-conditioning units, increases.

(D) The price of fans, a substitute in consumption, decreases.

(E) Consumers' incomes decrease.

Answer A

Correct. When consumers expect a greater increase in the future price of air-conditioning units, a normal good, they will be incentivized to purchase air-conditioning units, causing demand to increase, which increases the equilibrium price and equilibrium quantity in the short run.

19. A 5% increase in the price of Good A results in a 10% decrease in the quantity demanded of Good B. What is the cross-price elasticity between Good A and Good B, and what does this indicate about the relationship between these two goods?

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(A)

Cross-Price Elasticity	Relationship
−1	Complements

(B) ✓

Cross-Price Elasticity	Relationship
−2	Complements

(C)

Cross-Price Elasticity	Relationship
0.5	Complements

(D)

Cross-Price Elasticity	Relationship
−2	Substitutes

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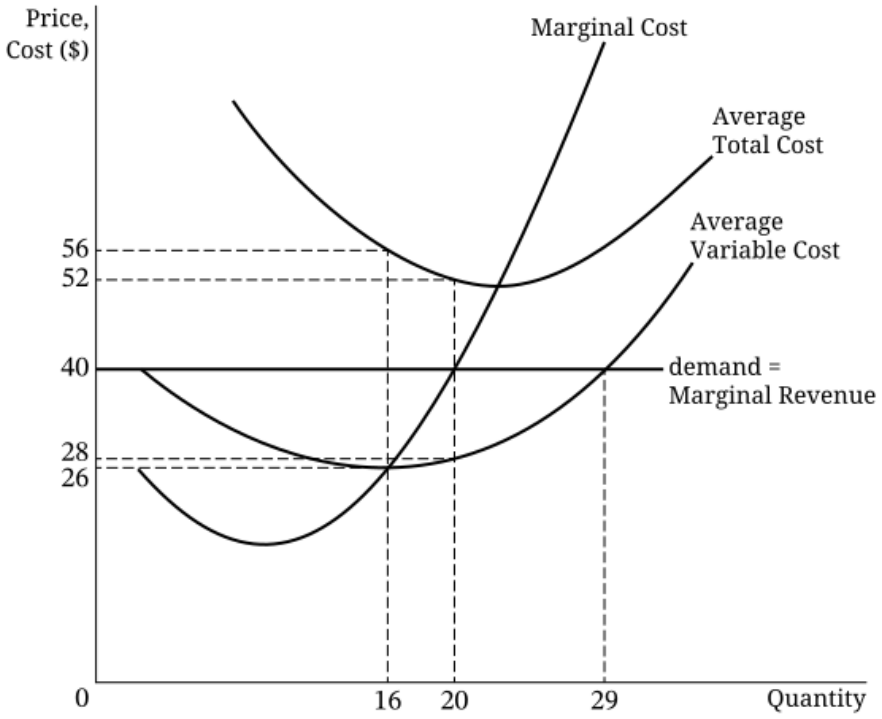
(E)

Cross-Price Elasticity	Relationship
0.5	Substitutes

Answer B

Correct. The cross-price elasticity between Good A and Good B can be calculated as the percentage change in the quantity demanded of Good B divided by the percentage change in the price of Good A. In this example, the price of Good A increased by 5%, and this led to a 10% decrease in the quantity demanded for Good B. Thus, the cross-price elasticity is $\frac{-10\%}{5\%} = -2$. When the cross-price elasticity between two goods is negative, the two goods are complements.

The graph shows the cost and revenue curves for the firm LuxEcon.



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20. LuxEcon operates in a perfectly competitive market and produces the profit-maximizing quantity of output. Which of the following correctly identifies LuxEcon's profit-maximizing quantity and economic profit?

(A) LuxEcon's profit-maximizing quantity is 16, and LuxEcon earns positive economic profit of $256.
(B) LuxEcon's profit-maximizing quantity is 16, and LuxEcon earns negative economic profit of $256.
(C) LuxEcon's profit-maximizing quantity is 20, and LuxEcon earns positive economic profit of $240.
(D) LuxEcon's profit-maximizing quantity is 20, and LuxEcon earns negative economic profit of $240. ✓
(E) LuxEcon's profit-maximizing quantity is 20, and LuxEcon earns negative economic profit of $480.

Answer D

Correct. A firm in a perfectly competitive market maximizes economic profit by producing the quantity where marginal revenue equals marginal cost. A firm's economic profit is calculated by (price − average total cost) × quantity. To maximize economic profit, LuxEcon will produce 20 units. At 20 units, LuxEcon's economic profit is $(\$40 - \$52) \times 20 = -\$240$.

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21. Which of the following statements is always true for a perfectly competitive market?

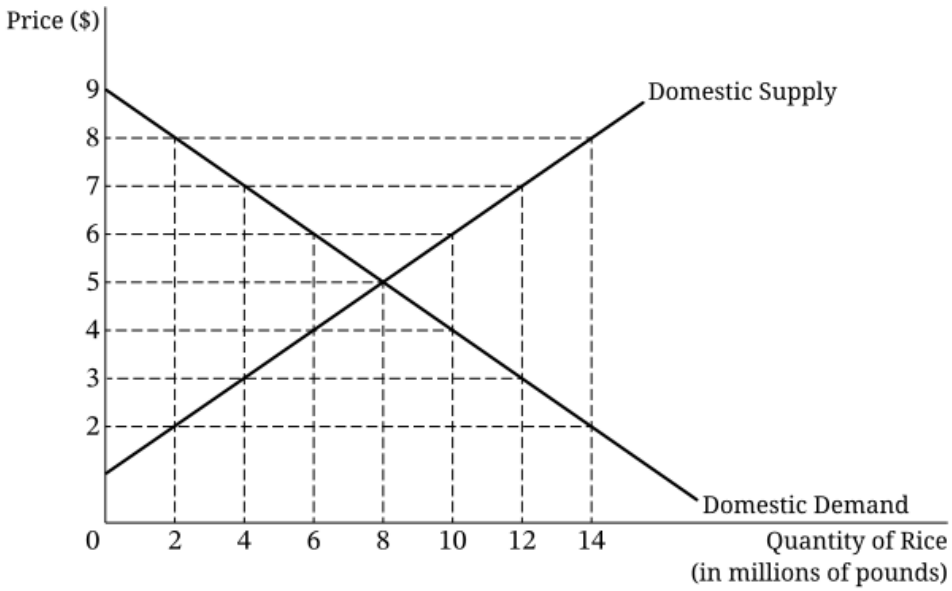
(A) Firms have no market power. ✓
(B) Firms produce differentiated products.
(C) Firms earn positive economic profit.
(D) There are high barriers to entry.
(E) There are relatively few competitors.

Answer A

Correct. Firms operating in a perfectly competitive market have no market power, which means they have no ability to set their own price for their products and must take the price as given from the market.

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The graph shows the domestic demand for rice and the domestic supply of rice in Deltaland.



22. If rice is freely traded in the world and the world price of rice is $3, then Deltaland will

(A) export 4 million pounds of rice

(B) export 8 million pounds of rice

(C) import 4 million pounds of rice

(D) import 8 million pounds of rice ✓

(E) import 12 million pounds of rice

Answer D

Correct. At a world price of rice of $3, the domestic quantity supplied of rice is 4 million pounds and the domestic quantity demanded is 12 million pounds. Thus, Deltaland will import the difference between the domestic quantity demanded and the domestic quantity supplied, which is equal to 8 million (= 12 million − 4 million) pounds of rice.

23. Assume unusually cold weather destroys some of a nation's strawberry crop, which results in an increase in total revenue for strawberry producers. Which of the following must be true?

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(A) The market supply of strawberries is elastic.
(B) The market supply of strawberries is inelastic.
(C) The market demand for strawberries is elastic.
(D) The market demand for strawberries is unit elastic.
(E) The market demand for strawberries is inelastic. ✓

Answer E

Correct. When unusually cold weather causes a leftward shift of the supply curve for strawberries, the price of strawberries increases, and the quantity of strawberries decreases. When price elasticity of demand is inelastic, the percentage decrease in quantity demanded is less than the percentage increase in price; this causes an increase in total revenue, since total revenue = price × quantity.

24. Which of the following differentiates a profit-maximizing firm in a perfectly competitive market from a profit-maximizing firm in an imperfectly competitive market?

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(A)

A firm in a perfectly competitive market	A firm in an imperfectly competitive market
is a price maker	is a price taker

(B)

A firm in a perfectly competitive market	A firm in an imperfectly competitive market
minimizes average total cost in the short run	maximizes total revenue in the short run

(C)

A firm in a perfectly competitive market	A firm in an imperfectly competitive market
earns zero economic profit in the short run	does not earn economic profit in the short run

(D) ✓

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A firm in a perfectly competitive market	A firm in an imperfectly competitive market
produces where price equals marginal cost	produces where price is greater than marginal cost

(E)

A firm in a perfectly competitive market	A firm in an imperfectly competitive market
produces in the elastic region of its demand curve	produces in the inelastic region of its demand curve

Answer D

Correct. A firm in a perfectly competitive market is a price taker and therefore has a horizontal demand curve, such that price is equal to marginal revenue. A profit-maximizing firm in a perfectly competitive market produces where marginal revenue equals marginal cost, and since price is also equal to marginal revenue in perfect competition, the firm thus produces where price equals marginal cost. However, a firm in an imperfectly competitive market is a price maker and thus faces a downward-sloping demand curve and a downward-sloping marginal revenue curve that lies below the demand curve. A profit-maximizing firm in an imperfectly competitive market also produces where marginal revenue equals marginal cost, but charges a price based on the demand for its product, which is greater than marginal cost.

25. Which of the following will definitely result in a decrease in a monopoly's profit-maximizing quantity of output?

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(A) A decrease in variable costs and the ability to perfectly price discriminate
(B) A decrease in variable costs and a decrease in demand for the monopoly's output
(C) An increase in variable costs and a decrease in demand for the monopoly's output ✓
(D) An increase in fixed costs and an increase in demand for the monopoly's output
(E) An increase in fixed costs and the ability to perfectly price discriminate

Answer C

Correct. An increase in variable costs increases average variable cost and marginal cost, shifting the marginal cost curve upward so it intersects the marginal revenue at a lower quantity of output. At the same time, a decrease in demand shifts the demand and marginal revenue curves to the left, leading to a decrease in the profit-maximizing quantity for the monopoly.

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The table shows the total cost schedule for a soybean farm.

Quantity (bushels)	Total Cost ($)
0	10
1	12
2	16
3	22
4	32
5	50
6	69

26. The farm grows and sells soybeans at a price of $15 per bushel in a perfectly competitive market. What is the farm's total economic profit at the profit-maximizing quantity of output?

(A) $10

(B) $21

(C) $23

(D) $25

(E) $28 ✓

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27. If the income elasticity of demand for Good X is negative, how will an increase in consumers' income affect the market for Good X?

(A) The demand curve will shift to the left, the equilibrium price will increase, and the equilibrium quantity will decrease.

(B) The demand curve will shift to the left, and both the equilibrium price and quantity will decrease. ✓

(C) The demand curve will shift to the right, and both the equilibrium price and quantity will increase.

(D) The supply curve will shift to the right, the equilibrium price will decrease, and the equilibrium quantity will increase.

(E) The supply curve will shift to the left, the equilibrium price will increase, and the equilibrium quantity will decrease.

Answer B

Correct. When the income elasticity of demand is negative for a good, that good is inferior. For inferior goods, such as Good X, an increase in consumers' incomes causes a leftward shift of the demand curve for that good, resulting in a decrease in both the equilibrium price and quantity.

28. Firm Z is a typical firm in a perfectly competitive market that produces a quantity of output where marginal revenue equals marginal cost in a constant-cost industry. If the sum of Firm Z's average fixed cost and average variable cost is below its marginal revenue at the profit-maximizing quantity, which of the following will occur in the long run?

(A) The firm will increase output.

(B) The firm will shut down.

(C) The firm will increase price.

(D) The firm will exit the market.

(E) New firms will enter the market. ✓

Answer E

Correct. Average total cost is equal to the sum of average fixed cost and average variable cost. When average total cost lies below marginal revenue (which is equal to the price) in perfect competition, firms are earning positive economic profit (since per-unit economic profit equals price minus average total cost). Since there are no barriers to entry in perfect competition, the existence of positive economic profit in the short run will cause new firms to enter the market in the long run.

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29. Which of the following is an example of a negative externality in production?

(A) An electronics store decreases the price of televisions during the holidays.

(B) A car insurance company charges a higher price for teenage drivers.

(C) A local paper mill emits an odor, imposing additional costs on nearby residents. ✓

(D) A pine tree in a public park provides pleasant shade for residents.

(E) A photographer accepts a price for work below marginal cost.

Answer C

Correct. Negative externalities in production occur when the production of a good causes a harmful effect on others not involved in the transaction. A local paper mill emitting an odor imposes additional costs, in the form of a marginal external cost, on nearby residents. Marginal social cost will exceed marginal private cost in this instance; this represents a negative externality in production.

30. A firm hires labor and rents machines as variable inputs from perfectly competitive factor markets to produce Good X. The firm also requires land, as a fixed input, for its operation. The firm's short-run profit-maximizing quantity of output would not be affected by a change in which of the following?

(A) The price of land ✓

(B) The price of Good X

(C) The marginal product of labor

(D) The marginal product of machines

(E) The wage rate

Answer A

Correct. Land represents a fixed cost in production. Since firms maximize economic profit by producing where marginal revenue equals marginal cost, fixed costs do not affect the profit-maximizing decision, as changes in a fixed cost have no impact on the firm's marginal revenue or marginal cost.

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The table shows the marginal utility that Olivia derives from consuming two goods: chocolate bars and slices of pizza.

Quantity of Chocolate Bars	Marginal Utility of Chocolate Bars (in utils)	Quantity of Pizza Slices	Marginal Utility of Pizza Slices (in utils)
1	10	1	26
2	6	2	20
3	5	3	15
4	4	4	12
5	2	5	10
6	1	6	9

31. Olivia has a limited weekly income of $10 and spends it all on chocolate bars and slices of pizza. Assume the price of each chocolate bar is $1 and the price of each slice of pizza is $2. What combination of chocolate bars and pizza slices will maximize Olivia's total utility given her weekly income?

(A) 0 chocolate bars and 5 slices of pizza

(B) 1 chocolate bar and 2 slices of pizza

(C) 2 chocolate bars and 4 slices of pizza ✓

(D) 4 chocolate bars and 3 slices of pizza

(E) 6 chocolate bars and 2 slices of pizza

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Answer C

Correct. Consumers maximize their total utility by consuming up to the point where marginal utility per dollar of one good is equal to that of the other good, while also spending their entire budget. In this example, the marginal utility per dollar spent on 2 chocolate bars is equal to $\frac{6}{\$1} = 6$, and the marginal utility per dollar spent on 4 slices of pizza is equal to $\frac{12}{\$2} = 6$. Additionally, Olivia spends $(\$1 \times 2) + (\$2 \times 4) = \$10$, which is the entire budget. Since Olivia consumes both goods up to the point where the marginal utility per dollar spent on each good is equal, and she spends the entire budget, Olivia must be maximizing total utility by consuming 2 chocolate bars and 4 slices of pizza.

---

32. Tornado-warning sirens are usually paid for by local governments rather than private individuals because

(A) each individual does not find the sirens to be of value
(B) sirens are rival and excludable in consumption
(C) private individuals lack the incentive to cover the cost of providing the sirens ✓
(D) sirens will be overproduced in the market equilibrium
(E) it is cheaper to produce sirens for local governments than to produce them for private individuals

Answer C

Correct. Tornado-warning sirens are an example of a public good, which are goods that are nonrival and nonexcludable in consumption. Because the sirens are nonrival and nonexcludable in consumption, all consumers within range would be able to benefit from their purchase without having to pay for them. A private individual would not be willing to cover the cost of providing the sirens, since there would be no way to extract payment from other individuals who would also benefit from the service the sirens provide. The problem of consumers being able to benefit from a public good without contributing to its cost is known as the free rider problem. As a result of the free rider problem, private individuals lack the incentive to cover the cost of public goods, which is why the government is typically the provider.

33. Brass With Class is a profit-maximizing firm that produces trumpets in a monopolistically competitive market. Brass With Class currently produces 100 trumpets and sells each trumpet at a price of $50. If the average total cost when producing 100 trumpets is $45, what is Brass With Class's total economic profit in the short run, and what adjustment will happen in the trumpet market in the long run?

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(A)

Economic Profit	Long-Run Adjustment
−$500	Existing firms will exit the market.

(B)

Economic Profit	Long-Run Adjustment
−$5	Existing firms will exit the market.

(C)

Economic Profit	Long-Run Adjustment
$0	The market will be in long-run equilibrium.

(D)

Economic Profit	Long-Run Adjustment
$5	New firms will enter the market.

(E) ✓

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Economic Profit	Long-Run Adjustment
$500	New firms will enter the market.

34. Which of the following changes will increase the equilibrium market wage for plumbers?

(A) A decrease in the market price of plumbing services

(B) A decrease in the amount of vacation time taken by plumbers

(C) A decrease in the productivity of plumbers

(D) An increase in the fees for plumber licenses required to practice plumbing ✓

(E) An increase in the quality of working conditions for plumbers

Answer D

Correct. An increase in the fees for plumber licenses required to practice plumbing would lead to a decrease in the supply of plumbers, resulting in an increase in the equilibrium market wage for plumbers.

35. Initially, Markus Corporation is the only firm that produces aluminum. The government breaks up Markus' monopoly, creating two firms in its place. The long-run average total cost for each firm is higher than if Markus operated alone in the industry. This would suggest that before the breakup, Markus Corporation was operating under conditions of

(A) monopolistic competition

(B) Nash equilibrium

(C) decreasing returns to scale

(D) economies of scale ✓

(E) diseconomies of scale

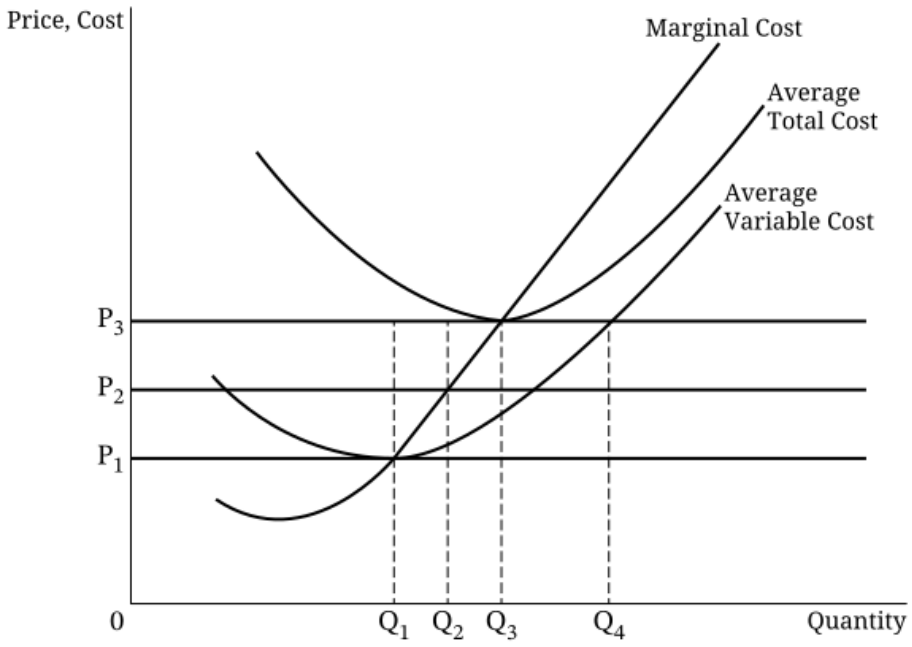
Answer D

Correct. If the long-run average total cost for the two new firms is higher than it would be if Markus operated alone as a monopoly, that suggests that Markus Corporation is a natural monopoly in the market

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for aluminum. A natural monopoly experiences economies of scale throughout the entire effective demand for its product.

The graph shows the cost and revenue curves for the firm Emma's Hoops.



36. Emma's Hoops produces toy hoops that are identical to all other toy hoops produced by the many firms in a market with no barriers to entry. The market price of toy hoops is P_2, and Emma's Hoops is producing the quantity Q_2 of toy hoops. Which of the following is true?

(A) The firm's average fixed cost is equal to $P_3 - P_1$.

(B) The firm is currently earning negative economic profit. ✓

(C) The firm is facing a perfectly inelastic demand curve.

(D) The firm should decrease production to Q_1 to maximize economic profit.

(E) The firm should increase its price to P_3 to maximize economic profit.

Answer B

Correct. The firm is currently charging price P_2 for its product, which is below the average total cost at the given quantity of output, Q_2. Since economic profit = (price – average total cost) × quantity of output, and average total cost is greater than price, the firm must be earning negative economic profit.

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37. A firm in a monopolistically competitive market is producing the profit-maximizing quantity at 60 units of output at a price of $12 per unit. What is the firm's economic profit if the firm's average variable cost is $8, its marginal cost is $7, and its average fixed cost is $2 at 60 units of output?

(A) −$300

(B) $120 ✓

(C) $180

(D) $240

(E) $300

Answer B

Correct. Economic profit = (price − average total cost) × quantity of output. Additionally, average total cost is equal to average variable cost plus average fixed cost. In this example, average total cost is $8 + $2 = $10. Therefore, the firm's economic profit is ($12 − $10) × 60 = $120.

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The table shows the total cost schedule for FineSeat Company.

Output	Total Cost ($)
0	120
1	200
2	270
3	375
4	480
5	620
6	780

38. FineSeat Company produces chairs. How many chairs will FineSeat Company produce to minimize average variable cost?

(A) 1 chair

(B) 2 chairs ✓

(C) 3 chairs

(D) 4 chairs

(E) 5 chairs

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Answer B

Correct. Average total cost is equal to average fixed cost plus average variable cost (ATC = AFC + AVC), and since total cost at 0 units of output is equal to fixed cost, it is possible to find the average variable cost (AVC = ATC − AFC) for each quantity of output for this firm. When the firm produces 2 chairs, its average total cost is $\frac{\$270}{2} = \$135$, and its average fixed cost is $\frac{\$120}{2} = \$60$, so its average variable cost is $\$135 - \$60 = \$75$. When the firm produces 3 chairs, its average total cost is $\frac{\$375}{3} = \$125$, and its average fixed cost is $\frac{\$120}{3} = \$40$, so its average variable cost is $\$125 - \$40 = \$85$. As output increases, average variable cost will also increase, so producing 2 chairs will minimize the firm's average variable cost.

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39. If the only two firms in an industry collude to charge a higher price and produce a lower quantity than what is socially optimal, what will happen to consumer surplus and total economic surplus in the market in the short run?

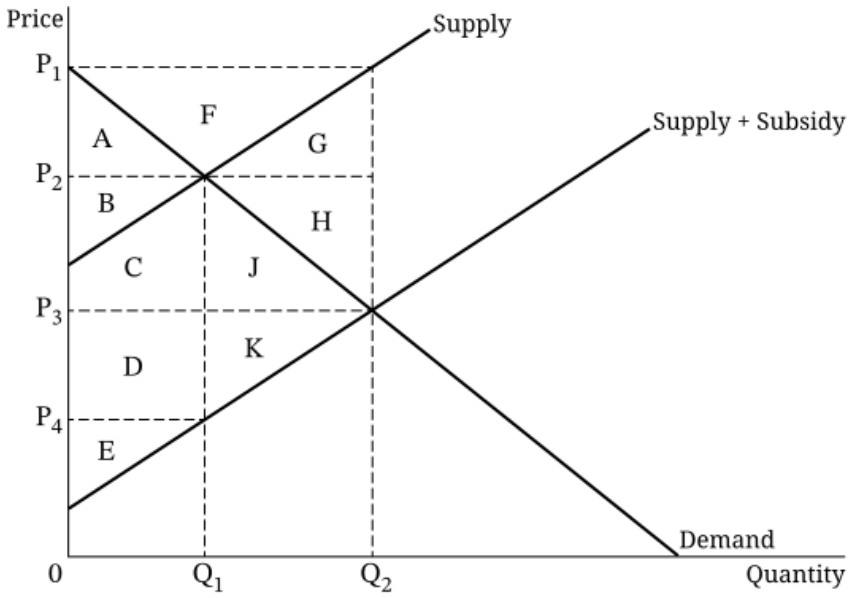
(A) Consumer surplus will decrease, and total economic surplus will stay the same.
(B) Consumer surplus will decrease, and total economic surplus will increase.
(C) Consumer surplus will increase, and total economic surplus will decrease.
(D) Consumer surplus and total economic surplus will both increase.
(E) Consumer surplus and total economic surplus will both decrease. ✓

Answer E

Correct. If the two firms charge a higher price and produce a lower quantity than what is socially optimal, consumers will pay a higher price for less output than they were consuming before, decreasing consumer surplus. Additionally, collusion will result in a lower quantity of output exchanged in the market as compared to equilibrium quantity exchanged in competitive markets, decreasing total economic surplus.

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The graph shows a per-unit subsidy being granted to producers of Good X. The letters on the graph represent enclosed areas.



40. What is the total cost of the per-unit subsidy to the government?

(A) Areas B, C, and J

(B) Areas B, C, and D

(C) Areas A, F, and G

(D) Areas A, B, C, F, G, H, and J ✓

(E) Areas A, B, C, D, E, J, and K

Answer D

Correct. The total cost of the per-unit subsidy to the government can be found by taking the value of the per-unit subsidy, which is given by the difference between the Supply and Supply + Subsidy curves ($P_1 - P_3$), and multiplying by the number of units exchanged in the market following the granting of the per-unit subsidy (Q_2). The rectangle formed by the areas A, B, C, J, H, G, and F is equal to $(P_1 - P_3) \times (Q_2)$, which represents the total cost of the per-unit subsidy to the government.

41. The change in consumer surplus as a result of the per-unit subsidy granted to producers of Good X is equal to

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(A) zero
(B) Area A
(C) Area J
(D) Areas J and K
(E) Areas B, C, and J ✓

Answer E

Correct. Consumer surplus can be represented by the area below the demand curve, which reflects consumers' willingness to pay and above the equilibrium price, for all units exchanged. Without the per-unit subsidy, consumer surplus in the market for Good X is represented by area A. With the per-unit subsidy, the equilibrium price decreases from P_2 to P_3 ,and the equilibrium quantity increases from Q_1 to Q_2, thus the area of consumer surplus increases to include areas B, C, and J.

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42. Which of the following would cause a decrease in both the market wage and the equilibrium quantity of labor?

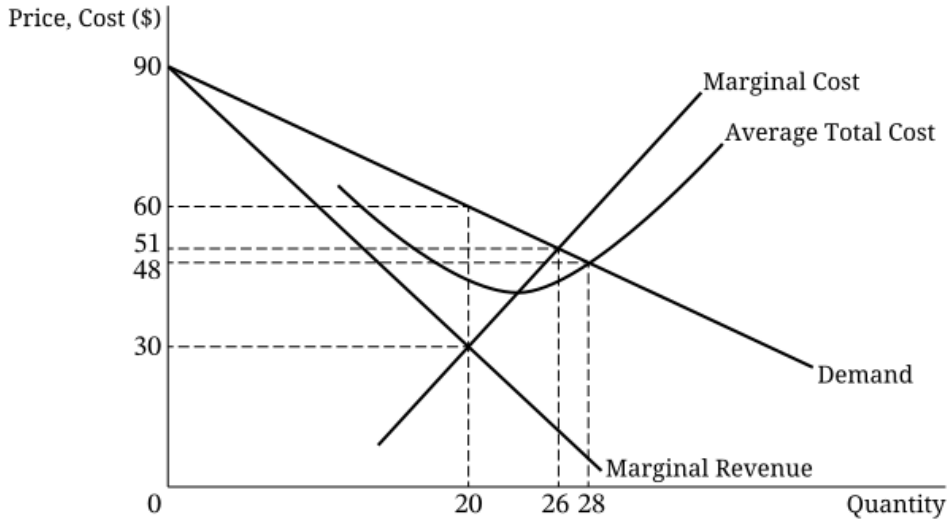
(A) A decrease in the supply of labor
(B) A decrease in the price of labor
(C) A decrease in the price of capital, a substitute for labor ✓
(D) An increase in the minimum wage
(E) An increase in the productivity of labor

Answer C

Correct. A decrease in the price of capital, a substitute for labor, would result in a decrease in the demand for labor, since labor would become relatively more expensive. As a result of the decrease in demand for labor, both the market wage and equilibrium quantity of labor would decrease.

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The graph shows the cost and revenue curves for a firm.



43. The firm operates in an imperfectly competitive market and produces the profit-maximizing quantity of output. If the firm could engage in perfect price discrimination, what would be the resulting consumer surplus and the change in deadweight loss?

(A) Consumer surplus would equal $0, and deadweight loss would decrease by $90. ✓

(B) Consumer surplus would equal $0, and deadweight loss would increase by $90.

(C) Consumer surplus would equal $507, and deadweight loss would decrease by $90.

(D) Consumer surplus would equal $300, and deadweight loss would increase by $180.

(E) Consumer surplus would equal $630, and deadweight loss would decrease by $180.

Answer A

Correct. If the firm could engage in perfect price discrimination, it would charge each consumer the maximum price that consumer is willing to pay, continuing to sell output until price equals marginal cost. Under this practice, the firm would produce 26 units instead of 20 units, and consumer surplus would fall to zero, as all surplus is captured by the firm. Perfect price discrimination would also eliminate deadweight loss, which was previously $\frac{1}{2} \times (\$60 - \$30) \times (26 - 20) = \$90$ when the firm could not price discriminate.

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44. Which of the following describes a difference between the imposition of a tariff on imports and the imposition of a quota on imports?

(A) A tariff will affect domestic consumption, whereas a quota will not.

(B) A tariff will affect domestic production, whereas a quota will not.

(C) A tariff will increase domestic consumer surplus, whereas a quota will not.

(D) A tariff will generate revenue for the government, whereas a quota will not. ✓

(E) A tariff will eliminate deadweight loss, whereas a quota will not.

Answer D

Correct. A tariff is a tax on imports that will generate revenue for the government imposing the tariff. A quota is a quantity restriction on imports; quotas do not generate any revenue for the government imposing the quota.

45. Good X, a popular item with consumers, is nonrival and non-excludable in consumption. What is the most likely outcome in the market for Good X if there is no government intervention?

(A) Firms will provide the socially optimal quantity of Good X because consumers will have a demand for it.

(B) Firms will provide the socially optimal quantity of Good X because they will be profitable in the short run.

(C) Firms will provide the socially optimal quantity of Good X despite the fact that marginal social cost is greater than the marginal private cost at the equilibrium market quantity.

(D) Firms will not provide the socially optimal quantity of Good X because people are able to consume it without having to pay for it. ✓

(E) Firms will not provide the socially optimal quantity of Good X because the marginal social cost is greater than the marginal private cost at the equilibrium market quantity.

Answer D

Correct. If Good X is nonrival and non-excludable in consumption, then Good X must be a public good that people are able to consume without having to pay. As a result, firms will not provide any quantity of Good X.

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The table shows output and cost data for Whit's Whistles, a firm that produces whistles.

Number of Workers	Total Output	Marginal Factor Cost ($)
1	16	35
2	35	65
3	51	95
4	65	125
5	77	155

46. Whit's Whistles is a profit-maximizing firm that hires workers from a monopsonistic labor market. The market for whistles is perfectly competitive, and the equilibrium price of whistles is $10. How many workers will Whit's Whistles hire to maximize profits?

(A) 1
(B) 2
(C) 3
(D) 4 ✓
(E) 5

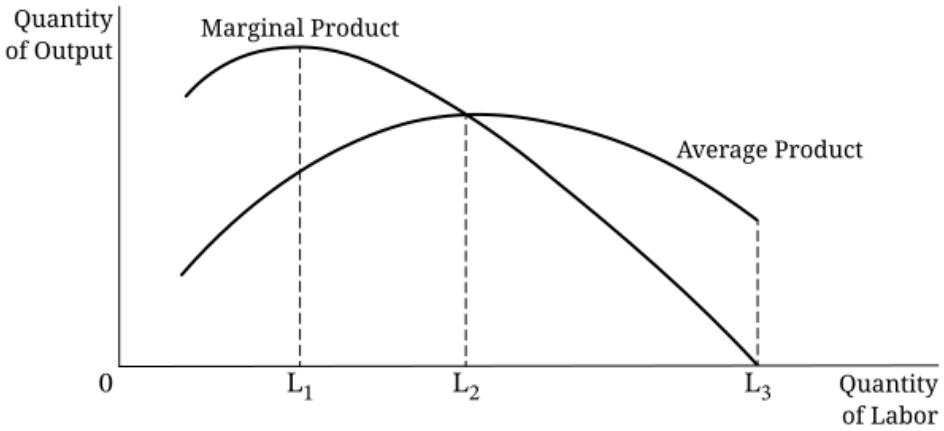
Answer D

Correct. Marginal Revenue Product = Marginal Product × Product Price. A monopsonistic firm will maximize profit by hiring workers until the marginal revenue product equals the marginal factor cost of the last worker hired. In this case, the marginal revenue product of the 4th worker is $140 (= 14 × $10),

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and the marginal factor cost is \$125. However, the marginal revenue product of the 5th worker is \$120 (= 12 × \$10), which is less than the marginal factor cost of \$155. As a result, Whit's Whistles will hire 4 workers to maximize profits.

The graph shows the marginal product and average product curves for a firm.



47. Which of the following is true about the production function as labor usage increases from L_1 to L_3 when all other inputs are held constant?

(A) There are increasing marginal returns.

(B) There are diminishing marginal returns. ✓

(C) There are decreasing returns to scale.

(D) Total product is maximized when the firm hires L_1 units of labor.

(E) Total product is maximized when the firm hires L_2 units of labor.

Answer B

Correct. As labor input increases from L_1 to L_3, the marginal product decreases, illustrating the principle of diminishing marginal returns: each additional unit of labor adds less to output than the unit before it.

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48. Avocado production requires land to grow avocado trees and workers to pick the avocados. Which of the following is most likely to occur if a binding minimum wageprice floor on wages is set in the labor market of avocado-farming workers?

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(A) Supply of avocados will decrease. ✓
(B) Demand for avocados will decrease.
(C) There will be a surplus of avocados.
(D) Avocado producers will hire more workers.
(E) The price of land used to grow avocados will increase.

Answer A

Correct. A binding minimum wage set above the equilibrium wage in the labor market of avocado-farming workers will increase the cost of production, which causes the supply of avocados to decrease.

49. Nikita was working at a law firm earning an annual salary of $80000, but she decided to start her own law practice. She used a building she owns and had been renting to a tenant for $15000 a year. Her law practice earned an accounting profit of $90000 in its first year. Based on the preceding information, what was Nikita's economic profit?

(A) −$80,000
(B) −$15,000
(C) −$5,000 ✓
(D) $10,000
(E) $75,000

Answer C

Correct. Economic profit equals total revenue minus the sum of explicit and implicit costs. Accounting profit equals total revenue minus explicit costs. Thus, economic profit equals accounting profit minus implicit costs. In this case, because running her own law practice requires her to quit the job that pays her $80,000 per year and use the building she had previously been renting for $15,000 per year, Nikita's implicit costs are the foregone annual salary of $80,000 and the foregone rent of $15,000 per year. As a result, her economic profit is −$5,000 (=$90,000 − $80,000 − $15,000).

50. Royal Bolts is a profit-maximizing firm in a perfectly competitive market earning positive economic profit. Which of the following will cause an increase in both the firm's profit and the number of units it produces in the short run?

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(A) The imposition of a per-unit tax on producers

(B) An increase in the price of a substitute in consumption ✓

(C) An increase in consumers' incomes if the product is an inferior good

(D) A decrease in the rent for the factory, a fixed input

(E) A decrease in the expected future price of the product by consumers

Answer B

Correct. An increase in the price of a substitute in consumption would increase the demand for the good Royal Bolts produces, since it would become relatively cheaper. The increase in demand would result in an increase in price and marginal revenue. To maximize profit, Royal Bolts would increase its production until marginal revenue equals marginal cost. As a result, the difference between price and average total cost would increase, increasing the firm's profit, and the firm would produce more units of output in the short run.

51. Two monopolies with identical cost structures are compared. One is an unregulated profit-maximizing monopoly, and the other is regulated to produce the quantity at which it breaks earns zero economic profitevenearns zero economic profit. Which of the following accurately describes the difference between the two monopolies?

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(A)

The Unregulated Monopoly	The Regulated Monopoly
Charges a price equal to average total cost	Charges a price equal to marginal cost

(B)

The Unregulated Monopoly	The Regulated Monopoly
Creates deadweight loss in the market	Eliminates deadweight loss from the market

(C)

The Unregulated Monopoly	The Regulated Monopoly
Experiences economies of scale	Experiences diseconomies of scale

(D)

The Unregulated Monopoly	The Regulated Monopoly
Collects all consumer surplus from the consumers	Transfers all consumer surplus to the government

(E) ✓

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The Unregulated Monopoly	The Regulated Monopoly
Produces where marginal revenue equals marginal cost	Produces where price equals average total cost

Answer E

Correct. The unregulated monopoly, like all profit-maximizing firms, would produce the quantity of output where marginal revenue equals marginal cost. However, the regulated monopoly is required to produce the quantity at which it breaks even, that is, earns zero economic profit, where the product's price equals average total cost.

The table shows the number of labor hours it takes Alpha and Beta to produce a smartphone or a cake with the same resources.

	Smartphone	Cake
Alpha	5 hours	2 hours
Beta	2 hours	1 hour

52. If tasks are assigned according to comparative advantage, which of the following is true?

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(A) Alpha will produce both goods.
(B) Beta will produce both goods.
(C) Alpha will produce smartphones and Beta will produce cakes.
(D) Alpha will produce cakes and Beta will produce smartphones. ✓
(E) Alpha has an absolute advantage in producing both goods.

Answer D

Correct. The country with the lower opportunity cost in production of a good is said to have the comparative advantage in the production of that good and will specialize by producing that good. In this case, Alpha can produce $\frac{1}{5}$ of a smartphone or $\frac{1}{2}$ of a cake per labor hour; therefore, Alpha's opportunity cost of producing 1 cake is $\frac{2}{5}$ of a smartphone. Beta can produce $\frac{1}{2}$ of a smartphone or 1 cake per labor hour; therefore, Beta's opportunity cost of producing 1 cake is $\frac{1}{2}$ of a smartphone. Since Alpha's opportunity cost of producing cakes is lower than Beta's ($\frac{2}{5} < \frac{1}{2}$), Alpha has a comparative advantage in the production of cakes and will specialize in producing cakes. Similarly, Beta's opportunity cost of producing smartphones is lower than Alpha's ($2 < \frac{5}{2}$), so Beta has a comparative advantage in the production of smartphones and will specialize in producing smartphones.

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53. Shrimp and chicken are substitute inputs in the production of frozen meals. Both shrimp and chicken are sold in perfectly competitive markets. If the government imposes a per-unit tax on shrimp, how will the demand for chicken and the equilibrium price of frozen meals be affected in the short run?

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(A)

Demand for Chicken	Equilibrium Price of Frozen Meals
Increase	Increase

(B)

Demand for Chicken	Equilibrium Price of Frozen Meals
Increase	Decrease

(C)

Demand for Chicken	Equilibrium Price of Frozen Meals
Increase	No change

(D)

Demand for Chicken	Equilibrium Price of Frozen Meals
Decrease	Increase

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(E)

Demand for Chicken	Equilibrium Price of Frozen Meals
Decrease	Decrease

Answer A

Correct. If the government imposes a per-unit tax on shrimp, the price of shrimp will increase. When the price of shrimp (which is a substitute for chicken in the production of frozen meals) increases, the demand for chicken increases. As the demand for chicken increases, the price of chicken also increases. As a result, since both inputs in the production of frozen meals have increased in price, the supply curve of frozen meals will shift to the left, resulting in an increase in the equilibrium price of frozen meals.

54. Ally's Candles and Bob's Candles are the only two sellers of candles in town. Both candle companies are considering changing their current pricing strategies. Each company is deciding between increasing prices or decreasing prices to increase their profits. Suppose Ally's Candles realizes that increasing price will increase its profits regardless of what Bob's Candles does. Which of the following concepts best describes this situation?

(A) Nash equilibrium
(B) Price discrimination
(C) Dominant strategy ✓
(D) Prisoner's Dilemma
(E) Collusion

Answer C

Correct. If Ally's Candles is always better off by increasing prices, regardless of what action Bob's Candles takes, Ally's Candles has a dominant strategy to increase prices.

55. Which of the following would cause an increase in the supply of tacos in the short run?

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(A) The price of tacos decreases.
(B) The demand for tacos increases.
(C) The price of beef, an input in the production of tacos, decreases. ✓
(D) The price of guacamole, a complement in consumption for tacos, decreases.
(E) The price of burritos, a substitute in consumption for tacos, decreases.

Answer C

Correct. A decrease in the price of an input in the production of a good decreases the cost of producing that good, which increases the supply of the good in the short run.

56. Suppose that Lindser Landscaping is the sole provider of landscaping services in a small city. A new firm, Horticultural Experts, enters the market. Which of the following is most likely to occur?

(A) Lindser Landscaping's demand will become more inelastic.
(B) Lindser Landscaping's total revenues will decrease. ✓
(C) Lindser Landscaping's economic profit will increase.
(D) The deadweight loss in the landscaping services market will increase.
(E) The market price of landscaping services will increase.

Answer B

Correct. If a new firm enters the market for landscaping services, existing firms (in this case, Lindser Landscaping) will likely lose some of their market share, since there are now close substitutes available in the market. Existing firms will face a decrease in the quantity of output sold, causing Lindser Landscaping's total revenues to decrease.

57. Donatello operates a firm that sells frozen treats in a perfectly competitive market. Which of the following would explain why Donatello is hiring more workers this year than last year?

(A) Other firms have opened more stores selling frozen treats.
(B) The government imposed a per-unit tax on consumers of frozen treats.
(C) The government removed a quota on imported frozen treats.
(D) There was an increase in demand for frozen treats. ✓
(E) There was a decrease in the price of frozen treats.

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Answer D

Correct. An increase in the demand for frozen treats will cause an increase in Donatello's demand for labor, leading to hiring more workers this year compared to last year.

The table shows the market price, quantity of a good exchanged, and the resulting deadweight loss in five different market structures.

Market	Price ($)	Quantity Exchanged (units)	Deadweight Loss ($)
1	25	100	50
2	30	750	300
3	45	500	100
4	50	300	0
5	60	20	200

58. Which market displays outcomes that are consistent with those that result under perfect competition?

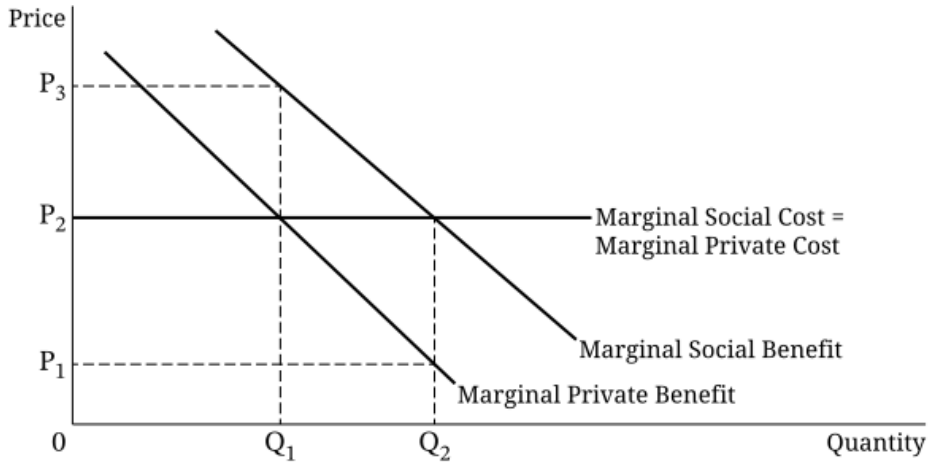
(A) Market 1
(B) Market 2
(C) Market 3
(D) Market 4 ✓
(E) Market 5

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Answer D

Correct. In a perfectly competitive market, the equilibrium outcome results in the price of a good that equals both the marginal private benefit received by the last unit consumed and the marginal private cost incurred to produce the last unit. As a result, the allocatively efficient quantity of the good is produced, and there is no deadweight loss.

The graph shows the market equilibrium for a good.



59. What is the socially optimal quantity, and what is the marginal external benefit at that quantity?

(A) Q_1, and the marginal external benefit is $P_3 - P_2$.
(B) Q_1, and the marginal external benefit is $P_2 - P_1$.
(C) Q_2, and the marginal external benefit is P_3.
(D) Q_2, and the marginal external benefit is P_1.
(E) Q_2, and the marginal external benefit is $P_2 - P_1$. ✓

Answer E

Correct. The socially optimal quantity occurs where the marginal social benefit (MSB) equals the marginal social cost (MSC); therefore, the socially optimal quantity is Q_2. The marginal external benefit is given by the difference between the marginal social benefit (MSB) and the marginal private benefit (MPB) curves; therefore, the marginal external benefit is $P_2 - P_1$ at Q_2.

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60. The small town of Marketville had four firms producing coal. The four firms then merged into one firm, which is now the sole employer of coal miners in Marketville. What effect will this change have on the market for coal miners in Marketville?

(A) Equilibrium wages and the level of employment will both increase.

(B) Equilibrium wages will increase, and the level of employment will decrease.

(C) Equilibrium wages and the level of employment will both decrease. ✓

(D) Equilibrium wages will decrease, and the level of employment will increase.

(E) Equilibrium wages will decrease, and the level of employment will remain the same.

Answer C

Correct. When several firms merge into a single employer, the firm becomes a monopsony in the labor market, which reduces wages and employment.