

AP MICROECONOMICS STUDY GUIDE

181 High-Yield Concepts

Advanced Placement Course | College Board CED-aligned

- All 6 CED units: foundations, supply & demand, costs & competition, imperfect competition, factors, and market failure
 - Every graph: cost curves, perfect competition, monopoly, monopsony, externalities, and the labor market
 - Exam weights on every unit; real exam format on the how-to page
 - Perfect for the AP Microeconomics exam in May

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How to Use This Guide

This guide condenses the AP Microeconomics course and exam description into high-yield concepts. It is not a textbook replacement -- it is the fastest way to review everything the exam covers and to target your weak units.

The AP Micro exam is 2 hours 10 minutes: 60 multiple-choice questions (70 min, 66.65% of the score) and 3 free-response questions (60 min, 33.35% of the score). The 6 units below map to the College Board Course and Exam Description, with unit weights on each section title.

How to use the concepts

- Each concept = term + concise explanation + high-yield exam tip (+ example where useful).
- First pass: read every concept in order. Underline anything unfamiliar.
- Second pass: focus only on the concepts you underlined.
- Two weeks before the exam: rapid-review every tip line (they are the highest-yield).
- Use the Table of Contents to jump straight to your weakest units.

Table of Contents

1	Unit 1: Basic Economic Concepts	30 concepts
2	Unit 2: Supply & Demand	29 concepts
3	Unit 3: Production, Cost & the Perfect Competition Model	30 concepts
4	Unit 4: Imperfect Competition	31 concepts
5	Unit 5: Factor Markets	31 concepts
6	Unit 6: Market Failure & the Role of Government	30 concepts

Total: 181 high-yield concepts

How to use the TOC: work through the units in order on your first pass, then jump back to your weakest units for review. Each concept includes an Explanation, a high-yield exam tip, and where useful an Example. Mark the concepts you miss with a small dot in the margin and revisit them 48 hours later.

Unit 1: Unit 1: Basic Economic Concepts

12-15% of the AP Micro exam. Scarcity, opportunity cost, supply and demand, and elasticity foundations.

1 Scarcity & Choice

Explanation: Scarcity means limited resources relative to unlimited wants, forcing every actor -- consumer, firm, government -- to make choices with trade-offs.

AP Micro Tip: *Scarcity is the universal starting point. Every AP Micro question about a choice rests on it.*

Example: A firm with one factory must choose between producing chairs or tables -- it cannot do both fully.

2 Opportunity Cost

Explanation: The value of the next-best alternative forgone when choosing. It is the true cost of any decision, whether for individuals, firms, or governments.

AP Micro Tip: *Opportunity cost = the NEXT BEST alternative given up. Calculate it from PPCs and input/output tables.*

Example: A student who studies instead of working a \$15/hour job incurs a \$15/hour opportunity cost.

3 Marginal Analysis

Explanation: Decisions are made at the margin: compare marginal benefit (MB) with marginal cost (MC) and act when $MB > MC$. Rational agents optimize by equating MB and MC.

AP Micro Tip: *Marginal = additional. The $MB = MC$ rule is the core of microeconomic optimization.*

Example: A firm adds output until the extra revenue from one more unit equals the extra cost of producing it.

4 The Production Possibilities Curve (PPC)

Explanation: The PPC shows all efficient combinations of two goods an economy can produce with given resources and technology. Points on the curve = efficient; inside = inefficient; outside = unattainable.

AP Micro Tip: *PPC = trade-offs and opportunity cost. Bowed-out = increasing opportunity cost; linear = constant.*

Example: Moving along the PPC from 100 apples to 90 apples and 20 oranges shows the cost of oranges in apples.

5 Economic Growth & the PPC

Explanation: Growth shifts the PPC outward via more resources, better technology, or higher productivity. Growth in one good alone pivots the curve.

AP Micro Tip: *Growth = outward shift. Investment in capital today is the standard cause the exam looks for.*

Example: Building more factories now shifts the PPC out, at the cost of current consumption.

6 Absolute vs Comparative Advantage

Explanation: Absolute advantage = producing more with the same resources. Comparative advantage = producing at lower opportunity cost. Trade is based on comparative advantage.

AP Micro Tip: *Compare opportunity costs to find comparative advantage -- never absolute numbers.*

Example: If Country A makes 10 cars or 20 bikes and Country B makes 8 cars or 24 bikes, B has the comparative advantage in bikes.

7 Specialization & the Gains from Trade

Explanation: When each party specializes in its comparative-advantage good, total output rises and both can consume beyond their own PPCs through trade.

AP Micro Tip: *Specialization + trade = consumption beyond the PPC. Terms of trade must lie between opportunity costs.*

Example: Two countries each producing their specialty can both end up with more of both goods.

8 Terms of Trade

Explanation: The rate of exchange between goods in trade. Mutually beneficial terms fall strictly between the two trading partners' opportunity costs.

AP Micro Tip: *Terms of trade between the two opportunity costs = both gain; outside that range, one side loses.*

Example: If A's cost of 1 chair = 2 tables and B's = 3 tables, any price between 2 and 3 tables per chair works.

9 The Law of Demand

Explanation: Ceteris paribus, as price falls, quantity demanded rises. The demand curve slopes downward, reflecting the substitution and income effects.

AP Micro Tip: *Demand slopes down: lower price -> more quantity demanded, holding everything else constant.*

Example: When the price of pizza falls, consumers buy more pizza -- a movement along the demand curve.

10 Determinants of Demand (Shifters)

Explanation: Demand shifts with tastes, income (normal vs inferior goods), prices of substitutes and complements, expectations, and the number of buyers.

AP Micro Tip: *TRIBE: Tastes, Related goods, Income, Buyers, Expectations. A price change never shifts demand.*

Example: A rise in the price of coffee (a complement) shifts the demand for creamer left.

11 The Law of Supply

Explanation: Ceteris paribus, as price rises, quantity supplied rises. The supply curve slopes upward because higher prices justify higher production costs.

AP Micro Tip: *Supply slopes up: higher price -> more quantity supplied, holding input prices and technology constant.*

Example: Higher milk prices lead dairy farms to produce more milk -- a movement along supply.

12 Determinants of Supply (Shifters)

Explanation: Supply shifts with input prices, technology, expectations, taxes and subsidies, and the number of sellers. Cheaper inputs shift supply right.

AP Micro Tip: *Remember the shifters: inputs, technology, expectations, taxes/subsidies, sellers.*

Example: A new machine that cuts production costs shifts the firm's supply curve to the right.

13 Market Equilibrium

Explanation: Equilibrium occurs where quantity demanded equals quantity supplied at the market-clearing price. The price adjusts to eliminate surpluses and shortages.

AP Micro Tip: *Equilibrium = $Q_d = Q_s$ at the intersection of demand and supply. Find it on a graph.*

Example: At the equilibrium price of \$4, buyers want 500 units and sellers offer 500 units.

14 Disequilibrium: Surplus & Shortage

Explanation: Above equilibrium price: surplus ($Q_s > Q_d$). Below equilibrium: shortage ($Q_d > Q_s$). Prices rise or fall to restore balance.

AP Micro Tip: *Surplus above, shortage below. Identify the adjustment direction from the price gap.*

Example: A price ceiling at \$2 in a market clearing at \$4 creates a persistent shortage.

15 Consumer Surplus

Explanation: The difference between what buyers are willing to pay and what they actually pay -- the area below demand and above the price line. It measures buyer benefit.

AP Micro Tip: *Consumer surplus = area under demand, above price. It shrinks when price rises.*

Example: Willing to pay \$10, paying \$7 -- consumer surplus of \$3 on that unit.

16 Producer Surplus

Explanation: The difference between the price sellers receive and their minimum acceptable price -- the area above supply and below the price line. It measures seller benefit.

AP Micro Tip: *Producer surplus = area above supply, below price. It shrinks when price falls.*

Example: A farmer who would accept \$4 and receives \$6 earns \$2 of producer surplus.

17 Total Surplus & Market Efficiency

Explanation: Total surplus = consumer + producer surplus. Free markets maximize it at equilibrium, achieving allocative efficiency with zero deadweight loss.

AP Micro Tip: *Efficiency = equilibrium where $MB = MC$. Any interference creates deadweight loss.*

Example: At equilibrium, every gainful trade occurs -- total surplus is maximal.

18 Deadweight Loss

Explanation: The loss in total surplus from trades that do not happen due to price controls, taxes, or market power. It is the inefficiency triangle.

AP Micro Tip: *Deadweight loss = lost surplus from foregone trades. Price controls and taxes create it.*

Example: A tax that raises price above equilibrium destroys the surplus from units no longer traded.

19 Price Ceilings

Explanation: A legal maximum price. A binding ceiling (below equilibrium) creates a shortage, reduces total surplus, and can breed black markets and quality degradation.

AP Micro Tip: *Binding ceiling = below equilibrium -> shortage + deadweight loss. Nonbinding = no effect.*

Example: Rent control below market rents creates waiting lists and landlord disinvestment.

20 Price Floors

Explanation: A legal minimum price. A binding floor (above equilibrium) creates a surplus. The minimum wage above equilibrium creates unemployment.

AP Micro Tip: *Binding floor = above equilibrium -> surplus + deadweight loss.*

Example: A \$15 minimum wage above the market wage reduces the quantity of labor demanded.

21 Price Elasticity of Demand

Explanation: The responsiveness of quantity demanded to price: $E = \% \text{ change in } Q_d / \% \text{ change in } P$. Elastic (>1), inelastic (<1), unit elastic ($=1$).

AP Micro Tip: *Elasticity formula and the midpoint method. Demand is more elastic with more substitutes and more time.*

Example: Gasoline is inelastic in the short run; restaurant meals are more elastic.

22 The Midpoint Method

Explanation: Elasticity = $(\text{change in } Q / \text{average } Q) / (\text{change in } P / \text{average } P)$. The midpoint method gives the same elasticity in both directions.

AP Micro Tip: *Use the midpoint method on the exam: averages in the denominators.*

Example: Price moves 10 to 12 and quantity 100 to 80: elasticity = $(20/90) / (2/11) = 1.22$.

23 Total Revenue & Elasticity

Explanation: If demand is elastic, a price cut raises total revenue (quantity rises proportionally more). If inelastic, a price cut lowers revenue. Revenue is maximized at unit elasticity.

AP Micro Tip: *Elastic -> price and revenue move opposite; inelastic -> they move together. The total-revenue test.*

Example: An inelastic price cut (e.g., 5% off milk) reduces total revenue because quantity barely rises.

24 Cross-Price Elasticity

Explanation: Cross-price elasticity measures how demand for one good responds to the price of another. Positive = substitutes; negative = complements; zero = unrelated.

AP Micro Tip: *Cross-price: substitutes positive, complements negative. Use it to classify related goods.*

Example: If the price of coffee rises and tea demand increases, tea and coffee are substitutes (positive cross-elasticity).

25 Income Elasticity

Explanation: Income elasticity measures demand response to income changes. Positive = normal good; negative = inferior good. Luxury goods have high positive elasticity.

AP Micro Tip: *Income elasticity: normal positive, inferior negative. Classify goods from the sign.*

Example: Bus travel has negative income elasticity (an inferior good); restaurant dining positive.

26 Price Elasticity of Supply

Explanation: The responsiveness of quantity supplied to price. Supply is elastic when firms can easily adjust output (long run) and inelastic when they cannot (short run).

AP Micro Tip: *Supply elasticity depends on time and capacity. Perfectly inelastic supply = vertical (land).*

Example: A concert venue's seats are fixed (inelastic supply); factories can add shifts over time (elastic).

27 Elasticity & Tax Incidence

Explanation: The burden of a tax falls more heavily on the side of the market that is LESS elastic. Inelastic consumers or producers bear most of the tax.

AP Micro Tip: *Tax burden falls on the less elastic side. Neither side can escape a tax easily.*

Example: A tax on gasoline is mostly paid by consumers because demand is inelastic.

28 Positive vs Normative Economics

Explanation: Positive statements describe what is (testable); normative statements prescribe what should be (value judgments).

AP Micro Tip: *Positive = facts, normative = opinions. The exam tests your ability to classify.*

Example: 'A price ceiling causes shortages' is positive; 'rent control is unfair' is normative.

29 The Circular Flow & Factor Payments

Explanation: Households supply resources and demand goods; firms supply goods and demand resources. Factor payments: wages (labor), rent (land), interest (capital), profit (entrepreneurship).

AP Micro Tip: *Circular flow = households and firms in product and resource markets. Match factors to payments.*

Example: Your salary is a wage paid in the resource market for your labor.

30 Incentives & Rational Choice

Explanation: People respond to incentives -- rewards and penalties. Rational choice weighs marginal benefits against marginal costs.

AP Micro Tip: *Every AP Micro scenario is about incentives. Identify the incentive before answering.*

Example: A subsidy for solar installers (a reward) increases the quantity of installations.

Unit 2: Unit 2: Supply & Demand

20-25% of the AP Micro exam. Applying demand and supply analysis to markets, price controls, and taxes.

31 The Demand Curve Revisited

Explanation: The demand curve shows the maximum price buyers will pay for each quantity (their willingness to pay). It is also a marginal-benefit curve.

AP Micro Tip: Demand = willingness to pay. The height of the curve is the marginal benefit of that unit.

Example: The 10th slice of pizza is worth less to you than the 1st -- the demand curve slopes down.

32 Shifts vs Movements Along Demand

Explanation: A price change moves ALONG the demand curve. A change in any other determinant shifts the whole curve. Never call a shift a movement.

AP Micro Tip: Price -> movement; other determinants -> shift. This distinction is tested constantly.

Example: A health scare shifts the demand for beef left; a sale price moves buyers along the same curve.

33 Shifts vs Movements Along Supply

Explanation: A price change moves along supply. Input costs, technology, taxes, or seller count shift supply. A change in the price of the good itself never shifts its supply.

AP Micro Tip: Price -> movement along supply; costs/technology/etc. -> shift.

Example: A rise in steel prices shifts the supply of cars left; a rise in car prices moves along supply.

34 Simultaneous Shifts of Demand & Supply

Explanation: When both curves shift, one outcome is certain and the other is ambiguous: e.g., demand up + supply up -> quantity up, price indeterminate.

AP Micro Tip: One variable is determined; the other depends on the relative sizes of the shifts.

Example: Demand and supply both rise: quantity definitely rises, but price could go either way.

35 The Determinants of Price Elasticity

Explanation: Elasticity is higher with more substitutes, a longer time horizon, a larger budget share, and for luxuries vs necessities.

AP Micro Tip: Substitutes, time, budget share, luxury/necessity -- the four determinants of elasticity.

Example: Salt is inelastic (few substitutes, tiny budget share); vacations are elastic.

36 Calculating Elasticity with the Midpoint Formula

Explanation: $E_d = (Q_2 - Q_1) / ((Q_2 + Q_1)/2)$ divided by $(P_2 - P_1) / ((P_2 + P_1)/2)$. Use absolute value for demand.

AP Micro Tip: Always use the midpoint formula; drop the negative sign for demand elasticity.

Example: Q falls 100 to 80 while P rises 4 to 6: elasticity = $(20/90)/(2/5) = 0.56$ (inelastic).

37 Elastic vs Inelastic Demand

Explanation: Elastic demand: quantity changes more than proportionally to price ($|E| > 1$). Inelastic: quantity changes less ($|E| < 1$). Unit elastic: equal ($|E| = 1$).

AP Micro Tip: Compare $|E|$ to 1. Elastic demand curves are flatter; inelastic are steeper.

Example: Necessities like insulin have inelastic demand; designer handbags have elastic demand.

38 The Total Revenue Test

Explanation: If price and total revenue move in the same direction, demand is inelastic. If they move opposite, demand is elastic. Revenue peaks at unit elasticity.

AP Micro Tip: Total revenue test: same direction = inelastic; opposite = elastic.

Example: A discount store cutting prices 20% sees revenue fall if its demand is inelastic.

39 Cross-Price Elasticity in Practice

Explanation: Cross-price elasticity = % change in Qd of good A / % change in price of good B. Positive for substitutes, negative for complements.

AP Micro Tip: *Classify goods by the sign of cross-price elasticity.*

Example: Higher phone prices lower demand for phone cases (negative -- complements).

40 Income Elasticity in Practice

Explanation: Income elasticity = % change in Qd / % change in income. Normal goods > 0; inferior goods < 0. Necessities between 0 and 1; luxuries > 1.

AP Micro Tip: *Sign classifies the good; magnitude classifies necessity vs luxury.*

Example: Ramen noodles have negative income elasticity; fine dining has high positive elasticity.

41 Elasticity of Supply & Time

Explanation: Supply is more elastic in the long run because firms can adjust capacity. In the short run, supply is relatively inelastic.

AP Micro Tip: *Time is the main driver of supply elasticity: long run = elastic.*

Example: Housing supply is inelastic in the short run (construction takes years) but more elastic over decades.

42 Consumer Surplus & the Demand Curve

Explanation: Consumer surplus on each unit = willingness to pay minus price. Total consumer surplus = the area between demand and price over all units bought.

AP Micro Tip: *Graph consumer surplus as the triangle under demand above the price line.*

Example: If demand shows you value the 5th unit at \$8 and price is \$5, you gain \$3 of surplus on it.

43 Producer Surplus & the Supply Curve

Explanation: Producer surplus on each unit = price minus marginal cost. Total producer surplus = the area between price and supply over all units sold.

AP Micro Tip: *Graph producer surplus as the triangle above supply below the price line.*

Example: The supply curve's height is the seller's marginal cost -- the minimum they will accept.

44 Changes in Equilibrium

Explanation: A demand increase raises both price and quantity. A supply decrease raises price and lowers quantity. Trace each shift on the graph.

AP Micro Tip: *Know the four basic cases: D up, D down, S up, S down -- price and quantity outcomes.*

Example: A drought (supply left) raises farm prices and lowers the quantity traded.

45 Binding vs Nonbinding Price Ceilings

Explanation: A ceiling above equilibrium is nonbinding (no effect). A ceiling below equilibrium is binding: it creates a shortage and deadweight loss.

AP Micro Tip: *Compare the ceiling to equilibrium: below = binding, above = not.*

Example: A \$10 ceiling on a market clearing at \$8 does nothing; at \$6 it creates a shortage.

46 Rent Control & Its Effects

Explanation: Rent control (a binding ceiling) creates housing shortages, waiting lists, reduced maintenance, black markets, and misallocation -- the classic policy lesson.

AP Micro Tip: *Rent control = the canonical price ceiling example: shortage + deadweight loss.*

Example: New York rent regulation keeps some rents below market, creating decades-long waitlists and landlord disinvestment.

47 The Minimum Wage & Labor Markets

Explanation: The minimum wage is a price floor in the labor market. Above equilibrium, it creates a surplus of labor (unemployment) and deadweight loss.

AP Micro Tip: *Minimum wage = labor price floor. The exam asks about its employment effects and who gains/loses.*

Example: A \$15 minimum where the market wage is \$10 reduces the quantity of labor demanded.

48 Quotas & Production Limits

Explanation: A quota limits quantity (e.g., taxi medallions, fishing rights). It raises price above equilibrium, creates deadweight loss, and transfers surplus to license holders.

AP Micro Tip: *Quota = quantity cap -> price rises, trades lost, deadweight loss.*

Example: NYC taxi medallions once sold for over \$1 million -- the quota's value to holders.

49 Taxes & Tax Incidence

Explanation: A per-unit tax shifts supply (or demand) and creates deadweight loss. The price buyers pay rises and the price sellers receive falls; the gap is the tax.

AP Micro Tip: *The tax wedge = buyer price minus seller price. Both sides share the burden based on elasticity.*

Example: A \$1 tax on a good: buyers pay \$0.70 more, sellers receive \$0.30 less -- incidence split.

50 Tax Burden & Elasticity

Explanation: The side with less elastic supply/demand bears more of the tax. If demand is perfectly inelastic, buyers pay the entire tax.

AP Micro Tip: *Less elastic side = larger burden. Perfectly inelastic = pays everything.*

Example: A tax on addictive cigarettes is mostly borne by smokers, not sellers.

51 Subsidies

Explanation: A subsidy (payment per unit) lowers the buyer's price and raises the seller's price, expanding quantity -- but creates deadweight loss from overproduction.

AP Micro Tip: *Subsidy = negative tax: quantity expands beyond the efficient level; deadweight loss remains.*

Example: A \$2-per-bushel corn subsidy raises farmer income and lowers consumer prices, at taxpayer cost.

52 The Welfare Effects of Price Controls

Explanation: Price controls transfer surplus between groups but always destroy total surplus: the deadweight loss triangle measures the lost gains from trade.

AP Micro Tip: *Any binding control -> deadweight loss. Evaluate winners, losers, and the total loss.*

Example: A price floor transfers surplus from consumers to producers but wastes the units no longer traded.

53 Tariffs & Import Quotas

Explanation: A tariff or quota on imports raises the domestic price, helping domestic producers but hurting consumers and creating deadweight loss. A tariff also raises government revenue.

AP Micro Tip: *Tariff = tax on imports (revenue + DWL); quota = quantity limit (DWL only). Consumers lose in both.*

Example: A 25% tariff on steel raises US steel prices, protecting mills but raising costs for automakers.

54 Double Shifts: Price & Quantity Outcomes

Explanation: When both curves shift, one outcome is determinate and the other depends on the relative sizes of the shifts.

AP Micro Tip: *Determine which variable is certain, then explain the ambiguity.*

Example: Demand rises and supply falls: price definitely rises; quantity is ambiguous.

55 Market Adjustment to Shocks

Explanation: Markets self-correct: shortages push prices up, surpluses push prices down, until equilibrium is restored. Adjustment speed depends on price flexibility.

AP Micro Tip: *Prices are the signal; disequilibrium triggers movement back to equilibrium.*

Example: After a surge in demand for masks, prices rose until supply expanded to match.

56 Shortages & Surpluses in Real Markets

Explanation: Persistent shortages and surpluses exist only where prices cannot adjust (price controls) -- not in free markets.

AP Micro Tip: *Controls, not markets, create persistent imbalances.*

Example: Gas lines in the 1970s came from price controls, not from actual scarcity alone.

57 Applications: Ticket Pricing & Surge Pricing

Explanation: Dynamic pricing (airlines, Uber surge, event tickets) uses price to clear markets in real time, converting shortages into equilibrium.

AP Micro Tip: *Real-world application of equilibrium: prices adjust to match demand.*

Example: Uber surge pricing raises fares until willing riders match available drivers.

58 The Market for Labor: Supply & Demand

Explanation: Labor demand comes from firms (derived from output demand); labor supply comes from workers. The wage is the equilibrium price of labor.

AP Micro Tip: *Labor markets work like goods markets: wage adjusts to clear the labor market.*

Example: A boom in home construction raises the demand for carpenters and their wages.

59 Markets & Information

Explanation: Prices aggregate dispersed information: they signal scarcity, guide resource allocation, and coordinate decentralized decisions.

AP Micro Tip: *The price system is an information mechanism -- Hayek's insight.*

Example: A spike in lumber prices signals builders to substitute materials and consumers to wait.

Unit 3: Unit 3: Production, Cost & the Perfect Competition Model

22-25% of the AP Micro exam. Costs, profit, and the perfectly competitive firm.

60 Profit Maximization

Explanation: The firm's goal is to maximize profit: total revenue minus total cost. It maximizes profit where marginal revenue equals marginal cost ($MR = MC$).

AP Micro Tip: *The $MR = MC$ rule is the profit-maximizing condition for ALL firms, regardless of market structure.*

Example: A firm keeps expanding output while each additional unit adds more revenue than cost.

61 Accounting vs Economic Profit

Explanation: Accounting profit = total revenue - explicit costs. Economic profit = total revenue - explicit costs - implicit costs (opportunity costs).

AP Micro Tip: *Economic profit subtracts opportunity costs; it is smaller than accounting profit.*

Example: A business earning \$80,000 that forgoes a \$60,000 salary has only \$20,000 of economic profit.

62 Explicit vs Implicit Costs

Explanation: Explicit costs are cash payments (wages, rent, materials). Implicit costs are opportunity costs of owned resources (foregone salary, interest on own capital).

AP Micro Tip: *Explicit = out-of-pocket; implicit = forgone opportunities. Both count in economic costs.*

Example: Using your own building rent-free has an implicit cost equal to the rent you forgo.

63 Normal Profit

Explanation: Normal profit = zero economic profit: total revenue covers all explicit and implicit costs, including a fair return. Earning normal profit means the firm earns exactly its opportunity cost.

AP Micro Tip: *Normal profit is NOT zero accounting profit -- it is zero ECONOMIC profit.*

Example: A firm earning normal profit is doing as well as its best alternative use of resources.

64 The Production Function

Explanation: The production function shows the maximum output from each combination of inputs: $Q = f(L, K)$. It underlies the cost curves.

AP Micro Tip: *Output depends on inputs. The production function's shape drives marginal product and costs.*

Example: With fixed capital, adding workers raises output at a decreasing rate -- diminishing returns.

65 Marginal Product

Explanation: Marginal product (MP) = the extra output from one more unit of input: $MP = \text{change in } Q / \text{change in input}$. It rises then falls with diminishing returns.

AP Micro Tip: *$MP = \text{change in output from the last worker}$. Diminishing marginal product sets in quickly.*

Example: Worker 1 adds 10 units, worker 2 adds 8, worker 3 adds 5 -- MP is falling.

66 The Law of Diminishing Marginal Returns

Explanation: With one input fixed, each additional unit of the variable input eventually adds less output than the previous unit. This makes marginal cost rise.

AP Micro Tip: *Diminishing returns -> rising marginal cost. It explains why MC curves slope up.*

Example: A kitchen with one oven: each extra cook adds less output once the oven is the bottleneck.

67 Total Product & Average Product

Explanation: Total product = total output. Average product = total output / units of input. MP crosses AP at AP's maximum.

AP Micro Tip: $AP = Q/\text{input}$; $MP = \text{change in } Q/\text{change in input}$. MP pulls AP with it.

Example: If a 5th worker raises AP, MP is above AP; if it lowers AP, MP is below.

68 Short Run vs Long Run

Explanation: The short run has at least one fixed input (capital); the long run has all inputs variable. Diminishing returns apply only in the short run.

AP Micro Tip: *Short run = fixed capital; long run = everything adjustable. Costs differ between them.*

Example: A factory cannot build a new plant in a month (short run) but can in five years (long run).

69 Fixed vs Variable Costs

Explanation: Fixed costs (FC) do not change with output (rent, insurance). Variable costs (VC) change with output (materials, hourly labor). Total cost = FC + VC.

AP Micro Tip: $FC = \text{output-independent}$; $VC = \text{output-dependent}$. FC exists even at zero output.

Example: A bakery's oven lease is fixed; its flour purchases are variable.

70 Total Cost, Revenue & Profit

Explanation: Total cost = FC + VC. Total revenue = price x quantity. Profit = TR - TC. The firm maximizes the gap between TR and TC.

AP Micro Tip: $\text{Profit} = TR - TC$; maximize where the gap is largest ($MR = MC$).

Example: Selling 100 units at \$5 with \$300 of costs yields \$200 of profit.

71 Marginal Cost (MC)

Explanation: Marginal cost = the extra cost of producing one more unit = change in TC / change in Q. It falls then rises (mirror of marginal product).

AP Micro Tip: $MC = \text{change in } TC / \text{change in } Q$. MC rises because of diminishing returns.

Example: Producing the 11th unit raises total cost from \$50 to \$56 -- MC = \$6.

72 Average Total Cost (ATC)

Explanation: ATC = total cost / quantity. It falls with economies of scale, bottoms out, then rises. The MC curve crosses ATC at its minimum.

AP Micro Tip: $ATC = TC/Q$. The MC curve intersects ATC and AVC at their minimums.

Example: If TC is \$500 for 100 units, ATC = \$5.

73 Average Variable Cost (AVC)

Explanation: AVC = variable cost / quantity. The MC curve crosses AVC at its minimum; the shutdown decision compares price to AVC.

AP Micro Tip: $AVC = VC/Q$. Price below AVC means the firm should shut down.

Example: With VC of \$300 on 100 units, AVC = \$3.

74 The Cost Curves' Relationships

Explanation: MC crosses AVC and ATC at their minimums. $ATC = AVC + AFC$; the gap shrinks as AFC falls. MC is the most important cost curve.

AP Micro Tip: Graph the U-shaped ATC and AVC with MC cutting through both minimums.

Example: When MC is below ATC, ATC falls; when MC is above, ATC rises.

75 Economies of Scale

Explanation: Long-run average costs fall as output rises: specialization, bulk purchasing, and spreading fixed costs. They create natural monopolies.

AP Micro Tip: Economies of scale = falling LRATC. They explain why some industries have one firm.

Example: A power grid's average cost falls as more customers connect -- a natural monopoly.

76 Diseconomies of Scale

Explanation: Long-run average costs rise at very large output: management complexity, communication breakdowns, and coordination costs.

AP Micro Tip: *Diseconomies of scale = rising LRATC beyond some size.*

Example: A giant firm's bureaucracy slows decisions so much that per-unit costs rise.

77 The Long-Run Average Cost Curve

Explanation: LRATC is the envelope of short-run ATC curves: falling (economies), flat (constant returns), rising (diseconomies). Its shape determines market structure.

AP Micro Tip: *LRATC U-shape: economies, constant returns, diseconomies. Flat LRATC = many firms can survive.*

Example: A minimum efficient scale far below market demand supports many competitive firms.

78 Perfect Competition: Characteristics

Explanation: Many small firms, identical (homogeneous) products, free entry and exit, and perfect information. Firms are price takers.

AP Micro Tip: *Four conditions: many firms, identical products, free entry/exit, perfect info. Price takers.*

Example: Wheat farming approximates perfect competition -- thousands of farms selling identical grain.

79 The Demand Curve for a Competitive Firm

Explanation: A price-taking firm faces a perfectly elastic (horizontal) demand curve at the market price: it can sell any quantity at that price.

AP Micro Tip: *Firm demand = horizontal at $P = MR$. Market demand slopes down; the firm's does not.*

Example: A wheat farmer can sell 1,000 or 10,000 bushels at the same market price.

80 Marginal Revenue = Price

Explanation: For a price-taking firm, $MR = P$: every unit sells at the same price. Profit maximization becomes $P = MC$.

AP Micro Tip: *In perfect competition, $MR = P$, so the $MR = MC$ rule becomes $P = MC$.*

Example: If the market price is \$4, the farmer's MR from every bushel is \$4.

81 Short-Run Profit Maximization

Explanation: Produce where $MR = MC$ ($P = MC$). If $P > ATC$, the firm earns economic profit; the profit rectangle is $(P - ATC) \times Q$.

AP Micro Tip: *Profit = $(P - ATC) \times Q$ at the $P = MC$ quantity. Graph the rectangle.*

Example: $P = \$10$, $ATC = \$7$, $Q = 100$: profit = \$300.

82 Short-Run Losses & the Shutdown Decision

Explanation: If $P < ATC$, the firm loses money. It keeps producing if $P > AVC$ (losses less than fixed costs) and shuts down if $P < AVC$.

AP Micro Tip: *Operate if $P > AVC$; shut down if $P < AVC$. Fixed costs are sunk in the short run.*

Example: A firm losing \$2/unit but covering its variable costs keeps operating to limit losses.

83 The Shutdown Point

Explanation: The shutdown point is where $P = \text{minimum } AVC$. Below it, producing adds losses beyond fixed costs; the firm produces zero.

AP Micro Tip: *Shutdown at $P = \min AVC$. Compare price to AVC, not ATC, for the short-run decision.*

Example: A restaurant that cannot cover food and labor costs (AVC) closes temporarily.

84 The Firm's Short-Run Supply Curve

Explanation: The competitive firm's supply curve is the MC curve above the shutdown point (min AVC). It shows the profit-maximizing output at each price.

AP Micro Tip: *Firm supply = MC above AVC. The market supply sums all firms' MC curves.*

Example: At each price, the farmer produces where $P = MC$ -- tracing out the supply curve.

85 Long-Run Equilibrium & Zero Profit

Explanation: Economic profits attract entry, shifting supply right until price falls to minimum ATC -- zero economic profit. Losses cause exit until price rises back.

AP Micro Tip: *Long run: entry/exit drives economic profit to zero. $P = MC = ATC$ (productive + allocative efficiency).*

Example: High restaurant profits attract new restaurants until profits return to normal.

86 Entry & Exit: The Adjustment Process

Explanation: Entry: profits -> new firms -> supply right -> price falls. Exit: losses -> firms leave -> supply left -> price rises. Both end at $P = \min ATC$.

AP Micro Tip: *Entry and exit are the invisible hand enforcing zero economic profit.*

Example: The 2010s craft-beer boom drew entrants until margins normalized.

87 Productive & Allocative Efficiency

Explanation: Productive efficiency: $P = \text{minimum ATC}$ (production at lowest cost). Allocative efficiency: $P = MC$ (resources allocated to what consumers value). Perfect competition achieves both.

AP Micro Tip: *Perfect competition is efficient on both margins. Monopoly achieves neither.*

Example: In long-run competition, output is produced at the lowest possible cost and priced at marginal cost.

88 Constant, Increasing & Decreasing-Cost Industries

Explanation: In constant-cost industries, entry does not raise input prices (flat LR supply). Increasing-cost industries see input prices rise (upward LR supply).

AP Micro Tip: *LR supply curve shape depends on input prices: flat, up, or down.*

Example: A growing restaurant industry does not bid up key inputs -- constant cost; farming does -- increasing cost.

89 Perfect Competition vs Reality

Explanation: Most real markets have product differentiation, market power, or barriers to entry. Perfect competition is a benchmark for efficiency, not a description of most industries.

AP Micro Tip: *Use perfect competition as the efficiency benchmark to compare against other structures.*

Example: No real market perfectly satisfies all four conditions, but agriculture and commodity trading come close.

Unit 4: Unit 4: Imperfect Competition

15-22% of the AP Micro exam. Monopoly, oligopoly, and monopolistic competition.

90 Market Power & Market Structures

Explanation: Market power = the ability to influence price. Structures range from perfect competition (none) to monopoly (maximum). The source of power is control over supply.

AP Micro Tip: *Market power = price-setting ability. Know the spectrum: competition, monopolistic competition, oligopoly, monopoly.*

Example: A patent-holding drug company has market power; a wheat farmer has none.

91 Monopoly: Characteristics

Explanation: A single seller, a unique product with no close substitutes, high barriers to entry, and price-making power. The monopolist faces the market demand curve.

AP Micro Tip: *One seller, no substitutes, barriers, price maker. The monopoly demand curve is the market demand curve.*

Example: A local water utility is a monopoly -- no substitute for tap water.

92 Barriers to Entry

Explanation: Barriers protect monopolies: patents and copyrights, control of key resources, natural monopoly (economies of scale), and government licenses.

AP Micro Tip: *Barriers = patents, resources, natural monopoly, licenses. They allow long-run economic profit.*

Example: Patents give drug firms 20 years of exclusive production rights.

93 Natural Monopoly

Explanation: A market where one firm can serve the entire demand at lower average cost than two or more firms (large economies of scale).

AP Micro Tip: *Natural monopoly = falling LRATC across market demand. Utilities are the example.*

Example: Duplicating a water or power grid would waste resources -- one firm is cheapest.

94 The Monopolist's Demand & MR

Explanation: The monopolist faces the downward-sloping market demand curve. Marginal revenue is BELOW price because selling more requires lowering the price on all units.

AP Micro Tip: *For a monopolist, $MR < P$ and MR is below the demand curve. No supply curve exists.*

Example: Selling 10 units at \$10 vs 11 units at \$9: MR of the 11th unit is -\$1.

95 Monopoly Profit Maximization

Explanation: The monopolist produces where $MR = MC$ and charges the highest price the demand curve allows at that quantity (read up to demand).

AP Micro Tip: *$MR = MC$ sets quantity; demand sets price. The monopolist produces less than the competitive output.*

Example: A drug firm produces where $MR = MC$, then charges the price patients will pay for that quantity.

96 Monopoly Profit & Loss

Explanation: Profit = $(P - ATC) \times Q$. A monopolist CAN earn long-run economic profit because barriers block entry; it can also suffer losses if demand is weak.

AP Micro Tip: *Monopoly profit rectangle = $(P - ATC) \times Q$. Losses are possible in the short run.*

Example: A new resort monopoly may lose money until demand builds, then earn persistent profit.

97 Monopoly vs Perfect Competition

Explanation: Compared to competition, monopoly produces less, charges more, and creates deadweight loss. It fails both productive and allocative efficiency.

AP Micro Tip: *Monopoly: higher P , lower Q , deadweight loss. Competition: $P = MC$, efficient.*

Example: A competitive industry would produce 100 units at \$5; the monopolist produces 60 at \$9.

98 Deadweight Loss of Monopoly

Explanation: The monopoly restricts output below the efficient level, destroying the surplus from units that consumers value more than their cost -- the DWL triangle.

AP Micro Tip: *Monopoly DWL = trades forgone between Q_m and Q_c . It is the social cost of market power.*

Example: The units between the monopoly and competitive outputs are worth more than they cost but never get produced.

99 Price Discrimination

Explanation: Charging different prices to different buyers for the same good. Conditions: market power, identifiable groups, no resale. It captures consumer surplus and can raise output.

AP Micro Tip: *Price discrimination requires market power, segmentation, and no arbitrage. Perfect discrimination eliminates DWL.*

Example: Movie theaters charge seniors less; airlines charge business travelers more.

100 Perfect (First-Degree) Price Discrimination

Explanation: Charging each buyer their maximum willingness to pay captures ALL consumer surplus, produces the competitive quantity, and eliminates deadweight loss.

AP Micro Tip: *Perfect price discrimination: $P = MC$ for the last unit, zero consumer surplus, zero DWL.*

Example: A haggling merchant who prices each sale at the buyer's maximum price captures everything.

101 Regulating Monopolies

Explanation: Regulators use: marginal-cost pricing (efficient but may cause losses), average-cost pricing (fair return, small DWL), and rate-of-return regulation.

AP Micro Tip: *MC pricing = efficient but loss-making (may need subsidy); AC pricing = zero economic profit.*

Example: Utility regulators typically set prices at average cost to guarantee a fair return.

102 Antitrust Policy

Explanation: Antitrust laws (Sherman 1890, Clayton 1914) ban monopolization, price-fixing, and anticompetitive mergers. Enforcement: DOJ and FTC.

AP Micro Tip: *Antitrust = breaking up or blocking market power. Know the Sherman and Clayton Acts.*

Example: The 1911 breakup of Standard Oil and the 1982 AT&T breakup are landmark cases.

103 Oligopoly: Characteristics

Explanation: A few large firms, interdependent decisions, high barriers to entry, and strategic behavior. Products may be identical (steel) or differentiated (autos).

AP Micro Tip: *Oligopoly = few firms, interdependence, strategic thinking. Firms must anticipate rivals' reactions.*

Example: The airline industry is an oligopoly -- a few carriers dominate each route.

104 Game Theory Basics

Explanation: Game theory models strategic interaction: players, strategies, and payoffs. The dominant strategy is best regardless of rivals' choices; the Nash equilibrium is where no one wants to change.

AP Micro Tip: *Game theory: dominant strategy, Nash equilibrium, payoff matrix. Use it for oligopoly decisions.*

Example: In a prisoner's dilemma, both firms end up worse off than if they had cooperated.

105 The Prisoner's Dilemma

Explanation: Two firms each choose to collude or cheat. Cheating dominates, so both cheat -- yielding a worse outcome for both than mutual cooperation. This explains why cartels are unstable.

AP Micro Tip: *Prisoner's dilemma: dominant strategy leads to a Pareto-inferior equilibrium.*

Example: Two gas stations would both profit from high prices, but each undercuts the other.

106 Dominant Strategy & Nash Equilibrium

Explanation: A dominant strategy is best no matter what the other does. A Nash equilibrium is a set of strategies where neither player can improve by changing alone.

AP Micro Tip: *Dominant strategy = always best; Nash = stable mutual best response.*

Example: If advertising pays regardless of the rival's choice, advertising is a dominant strategy.

107 Collusion & Cartels

Explanation: Oligopolists raise joint profit by colluding (fixing prices/output) like a monopoly. Cartels (OPEC) are unstable because each member has an incentive to cheat.

AP Micro Tip: *Collusion = acting as a monopoly; cartels face the cheating incentive.*

Example: OPEC sets production quotas, but members routinely pump more than agreed.

108 The Kinked Demand Curve

Explanation: The kinked demand model explains price stickiness: if a firm raises price, rivals do not follow (demand elastic); if it cuts price, rivals match (demand inelastic). Price stays near the kink.

AP Micro Tip: *Kinked demand = price rigidity in oligopoly. MC changes within the gap do not change price.*

Example: An airline that raises fares loses customers to rivals that do not follow.

109 Monopolistic Competition: Characteristics

Explanation: Many firms, differentiated products, low barriers to entry, and some market power over their own variety. Examples: restaurants, salons, clothing brands.

AP Micro Tip: *Monopolistic competition = many firms + differentiation + free entry. Each firm has a downward-sloping demand.*

Example: Every coffee shop on a street sells a slightly different product -- each has a mini-monopoly.

110 Monopolistic Competition: Short Run

Explanation: In the short run, a monopolistically competitive firm maximizes profit at $MR = MC$ and can earn profits or losses, like a monopolist.

AP Micro Tip: *Short run: $MR = MC$, profit possible, $P > MC$ (allocative inefficiency).*

Example: A new boutique earns profits until competitors copy its concept.

111 Monopolistic Competition: Long Run

Explanation: Free entry erodes profits: firms enter until economic profit is zero. Long-run equilibrium: $P = ATC$ but $P > MC$, with excess capacity.

AP Micro Tip: *Long run: zero economic profit at $P = ATC$, but price exceeds MC -- inefficiency remains.*

Example: Successful restaurants attract imitators until every one earns only normal profit.

112 Excess Capacity

Explanation: In long-run monopolistic competition, the firm produces below minimum ATC -- it could lower costs by producing more, but demand does not justify it. This is excess capacity.

AP Micro Tip: *Excess capacity = producing left of the ATC minimum; the price of product variety.*

Example: A half-empty restaurant could serve more cheaply per meal but would need more customers than demand allows.

113 Product Differentiation & Advertising

Explanation: Firms differentiate through quality, branding, location, and advertising, creating brand loyalty and some market power. Advertising shifts demand and raises costs.

AP Micro Tip: *Differentiation = downward-sloping demand; advertising = demand shift + cost rise.*

Example: Cereal brands spend heavily on ads to convince buyers their box is unique.

114 The Four-Firm Concentration Ratio

Explanation: The share of industry sales held by the four largest firms. High ratio = concentrated (oligopoly); low = competitive. It is a rough measure of market power.

AP Micro Tip: *Concentration ratio = top 4 firms' market share. Above ~40-60% suggests oligopoly.*

Example: If four firms control 80% of an industry, the market is highly concentrated.

115 The Herfindahl-Hirschman Index (HHI)

Explanation: HHI = sum of squared market shares. Below 1,500 = competitive; 1,500-2,500 = moderate; above 2,500 = concentrated. Used to screen mergers.

AP Micro Tip: *HHI = sum of squared shares. Antitrust regulators use it for merger review.*

Example: Two firms at 50% each: $HHI = 5,000$ -- very concentrated.

116 Contestable Markets

Explanation: A market is contestable if entry and exit are cheap (low sunk costs). Even a monopoly in a contestable market prices competitively to deter entrants.

AP Micro Tip: *Contestability = threat of entry disciplines pricing, even with one current firm.*

Example: A small-town airline route is contestable -- a rival can enter quickly, keeping fares low.

117 Price Leadership

Explanation: In some oligopolies, one dominant firm sets the price and others follow (tacit collusion without formal agreement).

AP Micro Tip: *Price leadership = follow-the-leader pricing, a form of tacit collusion.*

Example: When the biggest airline raises fares and rivals match, price leadership is at work.

118 Strategic Behavior & Barriers

Explanation: Incumbents deter entry with excess capacity, aggressive price cuts, brand proliferation, and exclusive contracts. These strategies protect market power.

AP Micro Tip: *Strategic entry deterrence = incumbents raising rivals' costs or threatening retaliation.*

Example: A dominant firm builds more capacity than it uses to signal it can crush entrants.

119 Comparing Market Structures

Explanation: Competition: many firms, $P = MC$, efficient. Monopolistic competition: many firms, $P > MC$, excess capacity, variety. Oligopoly: few firms, strategic. Monopoly: one firm, $P > MC$, DWL.

AP Micro Tip: *Compare firms count, product type, entry, and efficiency across the four structures.*

Example: From competition to monopoly: fewer firms, more market power, more deadweight loss.

120 Market Structure & Consumer Welfare

Explanation: Consumer welfare falls with market power: higher prices, less output, and deadweight loss -- but product variety (monopolistic competition) and innovation (Schumpeter) are offsets.

AP Micro Tip: *Weigh the efficiency costs of market power against variety and innovation benefits.*

Example: Patent monopolies raise drug prices but fund the R&D that creates new medicines.

Unit 5: Unit 5: Factor Markets

10-13% of the AP Micro exam. Labor, capital, land markets, and income distribution.

121 Derived Demand for Labor

Explanation: Labor demand is derived from the demand for the output labor produces: stronger output demand → higher labor demand. Firms hire labor to serve consumers.

AP Micro Tip: Labor demand is derived demand: it depends on the product's demand and labor's productivity.

Example: A boom in smartphone sales raises the demand for assembly workers.

122 Marginal Revenue Product (MRP)

Explanation: $MRP = \text{marginal product} \times \text{marginal revenue}$ = the extra revenue from hiring one more worker. $MRP = \text{change in TR} / \text{change in labor}$.

AP Micro Tip: $MRP = MP \times MR$. It is the demand curve for labor.

Example: A worker producing 10 units priced at \$5 has an MRP of \$50.

123 Marginal Resource Cost (MRC)

Explanation: MRC = the extra cost of hiring one more unit of the input. In a competitive labor market, $MRC = \text{the wage rate}$.

AP Micro Tip: $MRC = \text{change in TC} / \text{change in labor}$. Competitive labor market: $MRC = W$.

Example: If each worker is hired at \$15, $MRC = \$15$ per worker.

124 The Hiring Rule: $MRP = MRC$

Explanation: A profit-maximizing firm hires workers up to the point where $MRP = MRC$ ($MRP = \text{wage}$ in a competitive labor market).

AP Micro Tip: Hire while $MRP > \text{wage}$; stop when $MRP = \text{wage}$. This maximizes profit.

Example: If a worker's MRP is \$25 and the wage is \$20, hire; if \$18, do not.

125 The Competitive Labor Market

Explanation: In a competitive labor market, many firms hire identical workers; the market wage is set by labor supply and demand, and each firm faces a horizontal labor supply curve.

AP Micro Tip: Competitive labor: firm is a wage taker; $MRC = \text{wage}$; labor supply to the firm is flat.

Example: A small restaurant hiring in a big city takes the going wage as given.

126 The Firm's Labor Demand Curve

Explanation: The firm's labor demand curve is its MRP curve (the value of the marginal worker at each employment level). It slopes down as MRP falls.

AP Micro Tip: Labor demand = MRP curve, downward sloping because of diminishing MP.

Example: Hiring the 6th worker adds less output (and revenue) than the 5th -- the demand curve falls.

127 Monopsony in the Labor Market

Explanation: A monopsony is a single buyer of labor. It faces an upward-sloping labor supply curve, pays a wage BELOW MRP, and hires fewer workers than competition.

AP Micro Tip: Monopsony: $MRC > \text{wage}$; the firm pays less and hires less than a competitive market.

Example: A company town with one employer is the classic monopsony example.

128 Monopsony Hiring Equilibrium

Explanation: The monopsonist hires where $MRP = MRC$ (above the supply curve) and pays the wage on the supply curve at that quantity -- below MRP.

AP Micro Tip: Monopsony wage < competitive wage; employment < competitive employment. The wedge is exploitation.

Example: The lone hospital in a rural county pays nurses below their MRP.

129 Labor Unions & Collective Bargaining

Explanation: Unions bargain collectively for higher wages and better conditions. They can raise wages above competitive levels, with the effect depending on the labor market structure.

AP Micro Tip: *Unions = collective voice in wage setting. In a competitive market, higher wages reduce employment.*

Example: A union that raises wages to \$30 where the market wage is \$25 reduces the quantity of labor demanded.

130 The Supply of Labor & Wages

Explanation: Labor supply reflects workers' trade-off between work and leisure: higher wages draw more workers in, but very high wages can reduce hours (backward-bending supply).

AP Micro Tip: *Labor supply slopes up (wage vs hours), then can bend backward at high wages.*

Example: A doubling of wages may make some workers choose more leisure and fewer hours.

131 Human Capital & Wage Differences

Explanation: Human capital (education, skills, training) raises productivity and wages. Wage gaps across workers largely reflect human capital differences.

AP Micro Tip: *Human capital = investment in skills -> higher MRP -> higher wages.*

Example: Surgeons earn more than retail clerks largely because of their years of training.

132 Compensating Differentials

Explanation: Wages adjust to compensate for job characteristics: dangerous, unpleasant, or stressful jobs pay more, all else equal.

AP Micro Tip: *Compensating differentials = pay premiums for bad job attributes.*

Example: Night-shift workers and oil-rig roughnecks earn premiums for inconvenience and risk.

133 The Market for Capital

Explanation: Capital (machines, buildings) is priced by its rental rate or the interest rate on funds. Firms invest while the expected return exceeds the cost of capital.

AP Micro Tip: *Capital demand = the marginal revenue product of capital; its price is the interest/rental rate.*

Example: A firm buys a machine if its expected MRP exceeds its financing cost.

134 The Market for Land & Economic Rent

Explanation: Land is fixed in supply (perfectly inelastic); its price is determined entirely by demand. Economic rent = payment above the minimum needed to supply a factor.

AP Micro Tip: *Land: vertical supply, demand-determined price. Rent = payment beyond opportunity cost.*

Example: A prime downtown lot's price reflects its location rent, not its production cost.

135 Economic Rent vs Transfer Earnings

Explanation: Transfer earnings = the payment needed to keep a factor in its current use. Economic rent = payment above that. A superstar's salary is mostly economic rent.

AP Micro Tip: *Rent = payment minus opportunity cost; transfer earnings = opportunity cost.*

Example: A singer earning \$50M when she would work for \$100,000 collects almost pure rent.

136 Least-Cost Combination of Inputs

Explanation: A firm minimizes cost by hiring inputs so that MP per dollar is equal across inputs: $MP(L)/P(L) = MP(K)/P(K)$.

AP Micro Tip: *Equalize MP per dollar across inputs to minimize cost.*

Example: If $MP(L)/\$10 > MP(K)/\20 , hire more labor and less capital.

137 The Lorenz Curve & Income Distribution

Explanation: The Lorenz curve plots cumulative income share vs population share; the farther it bows from the diagonal, the more unequal the distribution. The Gini coefficient measures this.

AP Micro Tip: *Lorenz = income inequality graph; Gini = the numerical measure (0 = perfect equality, 1 = perfect inequality).*

Example: If the bottom 20% of households earn 3% of income, the Lorenz curve bows far from equality.

138 The Gini Coefficient

Explanation: Gini = the area between the Lorenz curve and the diagonal, divided by the whole triangle. Higher Gini = more inequality.

AP Micro Tip: *Gini: 0 = equality, 1 = inequality. Compare countries by Gini.*

Example: The US Gini (~0.41) is higher than most European countries' (~0.30).

139 Shifts in Labor Demand

Explanation: Labor demand shifts with output demand, productivity, the price of substitute inputs, and technology. Stronger demand shifts MRP right, raising wages.

AP Micro Tip: *Labor demand shifts: output demand, productivity, input prices, technology.*

Example: Automation can reduce the demand for some labor while raising it for others.

140 Elasticity of Labor Demand

Explanation: Labor demand is more elastic with more substitutes, a larger labor cost share, more time to adjust, and more elastic product demand.

AP Micro Tip: *Labor demand elasticity: substitutes, cost share, time, product demand.*

Example: Minimum-wage employment effects are larger where labor demand is elastic (fast food).

141 The Minimum Wage in Factor Markets

Explanation: A binding minimum wage creates a labor surplus (unemployment) in a competitive labor market, but can RAISE employment and wages in a monopsony.

AP Micro Tip: *Minimum wage: competitive market -> unemployment; monopsony -> possible employment gains.*

Example: Economists debate whether modest minimum-wage hikes reduce employment -- it depends on market structure.

142 Monopoly vs Monopsony

Explanation: A monopoly is a single seller of output; a monopsony is a single buyer of inputs. Both restrict quantity and create deadweight loss relative to competition.

AP Micro Tip: *Monopoly = seller power; monopsony = buyer power. Both misallocate resources.*

Example: A firm with monopoly output power and monopsony labor power distorts both markets.

143 The Backward-Bending Labor Supply

Explanation: At low wages, substitution dominates (higher wage -> more hours). At high wages, the income effect dominates (higher wage -> more leisure, fewer hours).

AP Micro Tip: *Backward-bending supply: substitution first, income effect later.*

Example: Raises for already-rich workers may reduce their work hours.

144 Occupational Licensing

Explanation: Licensing (doctors, barbers, lawyers) restricts labor supply, raising wages for license holders but raising prices for consumers. It is a barrier to entry in factor markets.

AP Micro Tip: *Licensing = supply restriction -> higher wages, higher prices. Weigh quality vs access.*

Example: State barber licenses raise barbers' wages but limit entry and raise haircut prices.

145 Efficiency Wages

Explanation: Paying above the market wage can raise productivity: less turnover, better effort, healthier workers. The efficiency-wage premium can be profit-maximizing.

AP Micro Tip: *Efficiency wages = above-market pay to motivate and retain workers.*

Example: Henry Ford's \$5 day cut turnover so much that profits rose.

146 The Marginal Productivity Theory of Distribution

Explanation: Under competition, each factor is paid its marginal revenue product: wages = MRP(L), rent = MRP(land), interest = MRP(capital). Payments exhaust total output.

AP Micro Tip: *Distribution follows marginal productivity: factors earn their MRP.*

Example: In a competitive equilibrium, the sum of factor payments equals the value of total output.

147 Wealth & Income Inequality

Explanation: Income inequality reflects differences in human capital, effort, market power, discrimination, inheritance, and luck. Policy tools: taxes, transfers, education.

AP Micro Tip: *Inequality = multiple causes; policy redistributes through taxes and transfers.*

Example: The top 1% of US households hold about a third of national wealth.

148 Factor Prices & Output Prices

Explanation: Factor prices and output prices are linked: higher output prices raise MRP and factor demand; higher factor costs raise output prices. The two markets are connected.

AP Micro Tip: *Output demand -> factor demand (derived). Factor costs -> output prices.*

Example: A surge in house prices raises construction wages; higher steel costs raise car prices.

149 Derived Demand in Real Markets

Explanation: Real-world labor demand tracks product cycles: tech booms raise engineer salaries; recessions cut them. Derived demand links workers to consumers.

AP Micro Tip: *Connect factor demand to the product market in FRQ answers.*

Example: The AI boom raised demand for machine-learning engineers and their salaries.

150 Land, Labor, Capital & Entrepreneurship

Explanation: The four factors earn rent, wages, interest, and profit. Entrepreneurship organizes the others and earns residual profit -- or bears losses.

AP Micro Tip: *Match factors to payments: land-rent, labor-wages, capital-interest, entrepreneurship-profit.*

Example: A founder's profit is the residual after paying the other three factors.

151 Technology & Factor Markets

Explanation: Technology can substitute for labor (automation), complement it (better tools), or create new tasks. Its net effect on wages depends on the balance.

AP Micro Tip: *Technology: substitutes or complements labor. History shows complementing wins overall.*

Example: ATMs reduced bank tellers' roles but expanded branch banking and new jobs.

Unit 6: Unit 6: Market Failure & the Role of Government

8-13% of the AP Micro exam. Externalities, public goods, and government responses.

152 Market Failure

Explanation: Market failure = when free markets fail to allocate resources efficiently. Causes: externalities, public goods, market power, and asymmetric information.

AP Micro Tip: *Market failure = efficiency gap: externalities, public goods, market power, information problems.*

Example: Pollution is a market failure -- the polluter's price omits the social cost.

153 Externalities: Overview

Explanation: An externality is a cost or benefit that spills onto third parties not involved in the transaction. Negative externalities create overproduction; positive create underproduction.

AP Micro Tip: *Externality = spillover to third parties. Negative -> too much; positive -> too little.*

Example: Secondhand smoke is a negative externality; a neighbor's well-kept garden is a positive one.

154 Negative Externalities of Production

Explanation: When production creates costs borne by others (pollution), the marginal social cost exceeds the private cost. The market overproduces relative to the efficient level.

AP Micro Tip: *Negative production externality: $MSC > MPC$; output too high; price too low.*

Example: A factory emitting smoke imposes costs on nearby residents -- overproduction of the factory's goods.

155 Positive Externalities of Consumption

Explanation: When consumption benefits others (education, vaccines), the marginal social benefit exceeds the private benefit. The market underproduces.

AP Micro Tip: *Positive consumption externality: $MSB > MPB$; output too low; under-consumption.*

Example: Getting vaccinated protects others -- the private decision ignores that social benefit.

156 Marginal Social Cost & Benefit

Explanation: $MSC = MPC + \text{external cost}$; $MSB = MPB + \text{external benefit}$. The efficient quantity sets $MSB = MSC$. Markets reach private equilibrium instead.

AP Micro Tip: *Efficiency at $MSB = MSC$; private markets equate $MPB = MPC$.*

Example: The efficient pollution level is where the marginal cleanup cost equals the marginal damage avoided.

157 Correcting Negative Externalities

Explanation: Pigouvian taxes (tax = external cost), tradable permits, and regulation push production back to the efficient level. Taxes internalize the externality.

AP Micro Tip: *Pigouvian tax = per-unit tax equal to the external cost -> efficient output.*

Example: A carbon tax makes polluters pay the social cost of emissions.

158 Pigouvian Taxes & Subsidies

Explanation: A tax equal to the external cost (negative externality) or a subsidy equal to the external benefit (positive externality) restores efficiency.

AP Micro Tip: *Tax internalizes external costs; subsidy internalizes external benefits. Both restore $MSB = MSC$.*

Example: A vaccine subsidy raises consumption toward the efficient level.

159 Tradable Permits (Cap-and-Trade)

Explanation: Government sets a total cap on pollution and issues permits that firms can trade. The cap sets quantity; trading allocates abatement to the lowest-cost firms.

AP Micro Tip: *Cap-and-trade: quantity fixed, price set by the market for permits.*

Example: The US sulfur dioxide (SO₂) trading program cut acid rain at a fraction of the estimated cost.

160 The Coase Theorem

Explanation: If property rights are clearly defined and transaction costs are low, private parties can bargain to the efficient outcome without government intervention.

AP Micro Tip: *Coase: private bargaining solves externalities with clear rights and low transaction costs.*

Example: A farmer and a factory can negotiate compensation for crop damage if bargaining is cheap.

161 Public Goods & the Free Rider Problem

Explanation: Public goods are nonrival (one person's use does not reduce another's) and nonexcludable (no one can be kept out). Free riders consume without paying, so markets underprovide.

AP Micro Tip: *Public goods: nonrival + nonexcludable -> free riding -> government provision.*

Example: National defense protects everyone; no one can be excluded, so few voluntarily pay.

162 Nonrival & Nonexcludable Goods

Explanation: Nonrival: consumption does not reduce availability. Nonexcludable: impossible or costly to exclude nonpayers. Private goods are rival and excludable; public goods are neither.

AP Micro Tip: *Classify goods on rivalry and excludability: private, public, common, club.*

Example: A lighthouse is nonexcludable; a movie theater seat is excludable.

163 Common Resources & the Tragedy of the Commons

Explanation: Common resources are rival but nonexcludable (fisheries, grazing land, clean air). Overuse by each individual destroys the resource for all -- the tragedy of the commons.

AP Micro Tip: *Tragedy of the commons: rival + nonexcludable -> overconsumption.*

Example: Overfishing depletes stocks because no single fisherman bears the full cost.

164 Asymmetric Information

Explanation: When one side of a transaction knows more than the other, markets can fail: sellers hide defects, buyers misjudge risk, and efficient trades do not occur.

AP Micro Tip: *Asymmetric information = unequal knowledge -> adverse selection and moral hazard.*

Example: A used-car seller knows the car's defects; the buyer does not.

165 Adverse Selection

Explanation: Adverse selection = when hidden information causes the market to attract the wrong participants: sicker people buy more insurance, lemons dominate used-car markets.

AP Micro Tip: *Adverse selection = hidden information before the deal -> bad risk pool.*

Example: If healthy people skip insurance, the insured pool gets sicker and premiums rise for everyone.

166 Moral Hazard

Explanation: Moral hazard = when insurance or protection changes behavior: insured people take more risks because they do not bear the full cost.

AP Micro Tip: *Moral hazard = hidden action after the deal -> more risk-taking.*

Example: Insured drivers may drive less carefully; bailed-out banks may lend recklessly.

167 The Principal-Agent Problem

Explanation: When an agent (manager, employee) pursues their own interest over the principal's (owner's), resources are misallocated. Aligning incentives (bonuses, stock options) mitigates it.

AP Micro Tip: *Principal-agent = conflicting incentives between boss and worker.*

Example: A manager who pads expenses or shirks monitoring is an agency problem.

168 Government Provision & Public Choice

Explanation: Governments provide public goods, regulate externalities, and redistribute income. Public choice theory warns that officials, like market actors, respond to incentives.

AP Micro Tip: *Government fixes market failure but can fail itself (public choice).*

Example: Politicians may fund showpiece projects for votes rather than efficient ones.

169 Rent-Seeking

Explanation: Rent-seeking = using resources to capture transfers or protection rather than create value: lobbying for subsidies, tariffs, or monopoly privileges.

AP Micro Tip: *Rent-seeking = lobbying for privilege; it wastes resources and creates inefficiency.*

Example: Firms lobby for tariff protection that raises profits without raising output.

170 The Median Voter Theorem

Explanation: In majority-rule voting on a single issue, the outcome reflects the median voter's preference -- where the median voter is the decisive voter.

AP Micro Tip: *Median voter = decisive in majority voting on one dimension.*

Example: Candidates converge to the center because the median voter decides.

171 Government Failure

Explanation: Government failure = when intervention makes things worse: regulatory capture, rent-seeking, information problems, and perverse incentives.

AP Micro Tip: *Government failure = the public-sector analog of market failure.*

Example: Politically protected industries (sugar, corn) show capture and inefficiency.

172 Antitrust as a Response to Market Power

Explanation: Antitrust policy attacks market failure from market power: breaking monopolies, blocking anticompetitive mergers, and punishing collusion.

AP Micro Tip: *Antitrust = the policy answer to the market power failure.*

Example: The DOJ blocked the AT&T-Time Warner merger in 2017 (later overturned).

173 Regulation of Natural Monopolies

Explanation: Regulators set prices and quality for natural monopolies (utilities) to prevent monopoly pricing while keeping the firm viable.

AP Micro Tip: *Natural monopoly regulation: price caps near average cost, quality standards.*

Example: State utility commissions approve electricity rate increases.

174 Income Redistribution & the Trade-Off

Explanation: Redistribution (taxes, transfers) reduces inequality but can dull work incentives and create deadweight loss -- the equity-efficiency trade-off.

AP Micro Tip: *Redistribution = equity vs efficiency: transfers help the poor but tax work.*

Example: A higher marginal tax rate on high earners raises revenue but may reduce effort.

175 The Welfare State & Efficiency

Explanation: Means-tested programs (TANF, SNAP, Medicaid) support the poor; critics cite dependency and benefit cliffs; supporters cite reduced poverty and better outcomes.

AP Micro Tip: *Welfare = insurance + redistribution; evaluate the incentive effects.*

Example: SNAP (food stamps) cuts food insecurity at modest administrative cost.

176 Pollution Policy Choices

Explanation: Policy menu: command-and-control regulation (limits), taxes, subsidies for clean tech, and tradable permits. Taxes and permits are cost-effective; regulation is simple but rigid.

AP Micro Tip: *Compare regulation vs market-based tools: cost-effectiveness and flexibility.*

Example: The EU Emissions Trading System uses permits; the US Clean Air Act uses both limits and trading.

177 Externalities & Property Rights

Explanation: Assigning property rights can internalize externalities: with clear rights and low transaction costs, bargaining (Coase) achieves efficiency.

AP Micro Tip: *Property rights + low transaction costs = private solutions to externalities.*

Example: Tradable fishing quotas assign rights, ending the race to overfish.

178 The Efficient Quantity of Pollution

Explanation: The efficient pollution level is where the marginal social cost of pollution equals the marginal benefit of the activity causing it -- not zero pollution.

AP Micro Tip: *Efficient pollution > 0: abate while cleanup cost < damage avoided.*

Example: Zero emissions would cost more than the damage they prevent -- efficiency is a balance.

179 Healthcare & Market Failure

Explanation: Healthcare suffers from asymmetric information, externalities (vaccines, contagion), public goods (research), and imperfect competition -- justifying government's role.

AP Micro Tip: *Healthcare market failures: information, externalities, and insurance market problems.*

Example: The uninsured can spread disease -- a negative externality of going without care.

180 Climate Change as Market Failure

Explanation: Climate change is the largest negative externality in history: emissions impose global costs not priced by markets. Carbon pricing and permits are the standard remedies.

AP Micro Tip: *Climate = global externality; policy = price carbon or cap emissions.*

Example: The social cost of carbon estimates the damage from each ton of CO2 emitted.

181 The Role of Government in a Market Economy

Explanation: Government's microeconomic roles: enforce property rights and contracts, correct externalities, provide public goods, maintain competition, and address inequality -- while avoiding government failure.

AP Micro Tip: *Summarize the government's five micro roles; weigh intervention against its costs.*

Example: From patents (incentives) to pollution caps (externalities), government shapes every market.

What's Next?

You have now reviewed every unit of the AP Microeconomics course, including all the graphs and market structures. Go back to the Table of Contents, find the units you marked, and reread just those tip lines. Two weeks out, do a rapid pass over the entire guide; the day before, review only the tip lines. On the FRQs, draw and label every graph correctly (cost curves, $MR = MC$, market structures, externalities), shift the right curve in the right direction, and always state the profit or loss condition -- labels, axis names, and the $MR = MC$ story are where most points are won and lost.

Pair it with the AP Macroeconomics Study Guide (\$19) -- both econ exams covered

Also available: AP Biology, AP Chemistry, AP Physics 1, AP Psychology, and more study guides

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