

UCLA-ALIGNED COURSE FIELD NOTES

ECON 1

Principles of Economics: Microeconomics

Scarcity, markets, incentives, firms, market power, policy, and welfare

How these notes are written. I wrote each chapter the way I wish the material had been explained the first time: the real idea, the point where I usually get stuck, the simplest mental model that still stays honest, and a worked decision instead of a polished answer appearing from nowhere. Every chapter closes with practice and a fully written solution. If a sentence sounds impressive but does not help me solve or explain something, it does not belong here.

Daniel Mastick

Curriculum map, working notes, practice, and solutions

Course map

Week	Core thread	What should be solid by the end
1	Scarcity, choice, and comparative advantage	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
2	Demand, supply, and market equilibrium	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
3	Elasticity, incidence, and revenue	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
4	Surplus, efficiency, and government intervention	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
5	Consumer choice and behavioral limits	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
6	Production, costs, and competitive firms	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
7	Monopoly, oligopoly, and strategic behavior	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
8	Externalities, public goods, information, and policy	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
9	Integration studio	Combine several chapters in one case, preserve their assumptions, and reconcile the result across representations.
10	Cumulative review	Retrieve the full course map from memory and solve mixed problems without chapter labels.

Scope anchor: <https://catalog.registrar.ucla.edu/course/2026/ECON1?year=2026>. The sequence is aligned to the official catalog description and expanded into a practical ten-week study plan.

How I would use this packet

Treat each numbered section as one chapter. Read the formal explanation, pause at the student interpretation, and see whether the easy version still says the same thing. Rework the example without looking, then cover the solution in the chapter practice box. The cumulative set at the end is deliberately mixed: knowledge becomes durable when I have to choose the tool instead of being told which chapter I am in.

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CHAPTER 1 Scarcity, choice, and comparative advantage

The idea

Economics studies choices under constraints. Opportunity cost, marginal reasoning, production possibilities, absolute advantage, and comparative advantage explain specialization and gains from exchange.

Rebuild the chapter from first principles

The claim I need to own is this: Economics studies choices under constraints. Opportunity cost, marginal reasoning, production possibilities, absolute advantage, and comparative advantage explain specialization and gains from exchange. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of scarcity, choice, and comparative advantage. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.
- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach scarcity, choice, and comparative advantage on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from the course foundations to demand, supply, and market equilibrium. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Economics studies choices under constraints.
- **What moves.** Opportunity cost, marginal reasoning, production possibilities, absolute advantage, and comparative advantage explain specialization and gains from exchange.
- **What keeps the answer honest.** The model becomes useful only when I can apply scarcity, choice, and comparative advantage to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

I do not ask what something costs in dollars first; I ask what the choice makes me give up.

The easy version

Economics studies choices under constraints.

Worked example

Question. Person A needs two hours per shirt and four per meal; B needs six per shirt and six per meal. Who has comparative advantage in shirts?

Walkthrough. A gives up half a meal per shirt; B gives up one meal. A has comparative advantage in shirts, while B has comparative advantage in meals.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. Person A needs two hours per shirt and four per meal; B needs six per shirt and six per meal. Who has comparative advantage in shirts?

Solution. A gives up half a meal per shirt; B gives up one meal. A has comparative advantage in shirts, while B has comparative advantage in meals.

Practice 2. Explain scarcity, choice, and comparative advantage to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct scarcity, choice, and comparative advantage from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a scarcity, choice, and comparative advantage problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 2 Demand, supply, and market equilibrium

The idea

Demand and supply schedules encode willingness to buy and sell at alternative prices. Movements along a curve follow own-price changes; shifts come from other determinants. Equilibrium coordinates plans but may not maximize fairness.

Rebuild the chapter from first principles

The claim I need to own is this: Demand and supply schedules encode willingness to buy and sell at alternative prices. Movements along a curve follow own-price changes; shifts come from other determinants. Equilibrium coordinates plans but may not maximize fairness. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of demand, supply, and market equilibrium. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.
- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach demand, supply, and market equilibrium on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from scarcity, choice, and comparative advantage to elasticity, incidence, and revenue. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Demand and supply schedules encode willingness to buy and sell at alternative prices.
- **What moves.** Movements along a curve follow own-price changes; shifts come from other determinants.

- **What keeps the answer honest.** Equilibrium coordinates plans but may not maximize fairness.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

I label whether a change moves along a curve or moves the whole curve before predicting price and quantity.

The easy version

Demand and supply schedules encode willingness to buy and sell at alternative prices.

Worked example

Question. Income rises for a normal good. What happens?

Walkthrough. Demand shifts right. With upward-sloping supply, equilibrium price and quantity both rise, holding other determinants fixed.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. Income rises for a normal good. What happens?

Solution. Demand shifts right. With upward-sloping supply, equilibrium price and quantity both rise, holding other determinants fixed.

Practice 2. Explain demand, supply, and market equilibrium to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct demand, supply, and market equilibrium from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a demand, supply, and market equilibrium problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent

check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 3 Elasticity, incidence, and revenue

The idea

Elasticity measures responsiveness independently of units. Price elasticity of demand shapes revenue effects and, with supply elasticity, determines who bears a tax rather than who legally remits it.

Rebuild the chapter from first principles

The claim I need to own is this: Elasticity measures responsiveness independently of units. Price elasticity of demand shapes revenue effects and, with supply elasticity, determines who bears a tax rather than who legally remits it. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of elasticity, incidence, and revenue. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.

- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach elasticity, incidence, and revenue on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from demand, supply, and market equilibrium to surplus, efficiency, and government intervention. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Elasticity measures responsiveness independently of units.
- **What moves.** Price elasticity of demand shapes revenue effects and, with supply elasticity, determines who bears a tax rather than who legally remits it.
- **What keeps the answer honest.** The model becomes useful only when I can apply elasticity, incidence, and revenue to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

My shorthand for this chapter is: my shorthand for this chapter is: the less flexible side of a market usually carries more of a tax burden.

The easy version

Elasticity measures responsiveness independently of units.

Worked example

Question. Demand elasticity is 0.4 in magnitude and price rises 10 percent. Approximate the quantity response.

Walkthrough. Quantity demanded falls about 4 percent. Because demand is inelastic, total spending or seller revenue rises approximately, absent other shifts.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the

work and verify the result independently.

Solved chapter practice

Practice 1. Demand elasticity is 0.4 in magnitude and price rises 10 percent. Approximate the quantity response.

Solution. Quantity demanded falls about 4 percent. Because demand is inelastic, total spending or seller revenue rises approximately, absent other shifts.

Practice 2. Explain elasticity, incidence, and revenue to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct elasticity, incidence, and revenue from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a elasticity, incidence, and revenue problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 4 Surplus, efficiency, and government intervention

The idea

Consumer and producer surplus measure gains from trade under the model. Taxes, subsidies, price ceilings, price floors, quotas, and trade barriers redistribute surplus and may create deadweight loss when mutually beneficial trades disappear.

Rebuild the chapter from first principles

The claim I need to own is this: Consumer and producer surplus measure gains from trade under the model. Taxes, subsidies, price ceilings, price floors, quotas, and trade barriers redistribute surplus and may create deadweight loss when mutually beneficial trades disappear. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of surplus, efficiency, and government intervention. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.
- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach surplus, efficiency, and government intervention on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from elasticity, incidence, and revenue to consumer choice and behavioral limits. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Consumer and producer surplus measure gains from trade under the model.
- **What moves.** Taxes, subsidies, price ceilings, price floors, quotas, and trade barriers redistribute surplus and may create deadweight loss when mutually beneficial trades disappear.

- **What keeps the answer honest.** The model becomes useful only when I can apply surplus, efficiency, and government intervention to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

I separate who wins, who loses, government revenue, and the trades that no longer happen.

The easy version

Consumer and producer surplus measure gains from trade under the model.

Worked example

Question. Why can a binding price ceiling create a shortage?

Walkthrough. The legal price lies below equilibrium, so quantity demanded rises while quantity supplied falls. Nonprice rationing determines who receives the limited quantity.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. Why can a binding price ceiling create a shortage?

Solution. The legal price lies below equilibrium, so quantity demanded rises while quantity supplied falls. Nonprice rationing determines who receives the limited quantity.

Practice 2. Explain surplus, efficiency, and government intervention to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct surplus, efficiency, and government intervention from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a surplus, efficiency, and government intervention problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent

check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 5 Consumer choice and behavioral limits

The idea

Budget constraints describe affordability; preferences, marginal utility, and substitution describe choice. The consumer optimum balances marginal benefit per dollar, while behavioral economics studies systematic departures from the fully rational benchmark.

Rebuild the chapter from first principles

The claim I need to own is this: Budget constraints describe affordability; preferences, marginal utility, and substitution describe choice. The consumer optimum balances marginal benefit per dollar, while behavioral economics studies systematic departures from the fully rational benchmark. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of consumer choice and behavioral limits. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes,

the invariant breaks, or the model stops matching reality.

- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach consumer choice and behavioral limits on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from surplus, efficiency, and government intervention to production, costs, and competitive firms. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Budget constraints describe affordability; preferences, marginal utility, and substitution describe choice.
- **What moves.** The consumer optimum balances marginal benefit per dollar, while behavioral economics studies systematic departures from the fully rational benchmark.
- **What keeps the answer honest.** The model becomes useful only when I can apply consumer choice and behavioral limits to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

I treat the rational model as a useful baseline, not a claim that people are calculators.

The easy version

Budget constraints describe affordability; preferences, marginal utility, and substitution describe choice.

Worked example

Question. A consumer gets 12 marginal utility from a 3-dollar good and 10 from a 2-dollar good. Which gives more utility per dollar?

Walkthrough. The first gives 4 units per dollar; the second gives 5. At an interior optimum the consumer would shift spending toward the second until marginal utility per dollar equalizes.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. A consumer gets 12 marginal utility from a 3-dollar good and 10 from a 2-dollar good. Which gives more utility per dollar?

Solution. The first gives 4 units per dollar; the second gives 5. At an interior optimum the consumer would shift spending toward the second until marginal utility per dollar equalizes.

Practice 2. Explain consumer choice and behavioral limits to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct consumer choice and behavioral limits from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a consumer choice and behavioral limits problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 6 Production, costs, and competitive firms

The idea

Production maps inputs to output. Diminishing marginal product shapes short-run cost; fixed, variable, average, and marginal cost answer different decisions. A competitive firm produces where price equals marginal cost when operating is worthwhile.

Rebuild the chapter from first principles

The claim I need to own is this: Production maps inputs to output. Diminishing marginal product shapes short-run cost; fixed, variable, average, and marginal cost answer different decisions. A competitive firm

produces where price equals marginal cost when operating is worthwhile. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of production, costs, and competitive firms. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.
- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach production, costs, and competitive firms on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from consumer choice and behavioral limits to monopoly, oligopoly, and strategic behavior. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Production maps inputs to output.
- **What moves.** Diminishing marginal product shapes short-run cost; fixed, variable, average, and marginal cost answer different decisions.
- **What keeps the answer honest.** A competitive firm produces where price equals marginal cost when operating is worthwhile.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

Sunk cost cannot be recovered, so I refuse to let it decide the next unit.

The easy version

Production maps inputs to output.

Worked example

Question. Price is 20, marginal cost of the next unit is 17, and the firm is operating. Produce it?

Walkthrough. Yes, because the unit adds 20 revenue and 17 cost. Continue until marginal cost reaches price, subject to shutdown conditions.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. Price is 20, marginal cost of the next unit is 17, and the firm is operating. Produce it?

Solution. Yes, because the unit adds 20 revenue and 17 cost. Continue until marginal cost reaches price, subject to shutdown conditions.

Practice 2. Explain production, costs, and competitive firms to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct production, costs, and competitive firms from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and

choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a production, costs, and competitive firms problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 7 Monopoly, oligopoly, and strategic behavior

The idea

Market power lets a firm face downward-sloping demand. Monopoly chooses quantity where marginal revenue equals marginal cost and charges from demand; oligopoly outcomes depend on strategic interaction, entry, information, and repeated play.

Rebuild the chapter from first principles

The claim I need to own is this: Market power lets a firm face downward-sloping demand. Monopoly chooses quantity where marginal revenue equals marginal cost and charges from demand; oligopoly outcomes depend on strategic interaction, entry, information, and repeated play. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of monopoly, oligopoly, and strategic behavior. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.

- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.
- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach monopoly, oligopoly, and strategic behavior on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from production, costs, and competitive firms to externalities, public goods, information, and policy. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Market power lets a firm face downward-sloping demand.
- **What moves.** Monopoly chooses quantity where marginal revenue equals marginal cost and charges from demand; oligopoly outcomes depend on strategic interaction, entry, information, and repeated play.
- **What keeps the answer honest.** The model becomes useful only when I can apply monopoly, oligopoly, and strategic behavior to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

My shorthand for this chapter is: my shorthand for this chapter is: a monopolist cannot independently choose both price and quantity; the demand curve connects them.

The easy version

Market power lets a firm face downward-sloping demand.

Worked example

Question. Why is monopoly price above marginal cost in the standard model?

Walkthrough. To sell another unit, the monopolist lowers price on the marginal unit and often existing units, so marginal revenue lies below price. Setting marginal revenue equal to marginal cost leaves price above marginal cost.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. Why is monopoly price above marginal cost in the standard model?

Solution. To sell another unit, the monopolist lowers price on the marginal unit and often existing units, so marginal revenue lies below price. Setting marginal revenue equal to marginal cost leaves price above marginal cost.

Practice 2. Explain monopoly, oligopoly, and strategic behavior to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct monopoly, oligopoly, and strategic behavior from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a monopoly, oligopoly, and strategic behavior problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 8 Externalities, public goods, information, and policy

The idea

Markets may misallocate resources when actions spill onto others, goods are nonrival or nonexcludable, information is asymmetric, or rights are incomplete. Taxes, permits, standards, property rules, disclosure, and public provision have different information and enforcement costs.

Rebuild the chapter from first principles

The claim I need to own is this: Markets may misallocate resources when actions spill onto others, goods are nonrival or nonexcludable, information is asymmetric, or rights are incomplete. Taxes, permits, standards, property rules, disclosure, and public provision have different information and enforcement costs. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of externalities, public goods, information, and policy. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.
- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach externalities, public goods, information, and policy on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from monopoly, oligopoly, and strategic behavior to the cumulative course model. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Markets may misallocate resources when actions spill onto others, goods are nonrival or nonexcludable, information is asymmetric, or rights are incomplete.
- **What moves.** Taxes, permits, standards, property rules, disclosure, and public provision have different information and enforcement costs.
- **What keeps the answer honest.** The model becomes useful only when I can apply externalities, public goods, information, and policy to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

Market failure does not make any policy automatically good; I compare the failure with the policy's own incentives and administrative limits.

The easy version

Markets may misallocate resources when actions spill onto others, goods are nonrival or nonexcludable, information is asymmetric, or rights are incomplete.

Worked example

Question. A factory's pollution imposes 30 of marginal external cost per unit. What would a corrective tax target?

Walkthrough. A Pigouvian tax of 30 per unit would align private marginal cost with social marginal cost at the relevant output, assuming the damage estimate and enforcement are reliable.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. A factory's pollution imposes 30 of marginal external cost per unit. What would a corrective tax target?

Solution. A Pigouvian tax of 30 per unit would align private marginal cost with social marginal cost at the relevant output, assuming the damage estimate and enforcement are reliable.

Practice 2. Explain externalities, public goods, information, and policy to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct externalities, public goods, information, and policy from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a externalities, public goods, information, and policy problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

Cumulative study plan

I use this packet in three passes. First I reconstruct each model and work its examples without looking. Second I mix chapters so the tool is no longer named for me. Third I explain a complete case aloud, including assumptions, units, uncertainty, failure modes, and what evidence would change my conclusion.