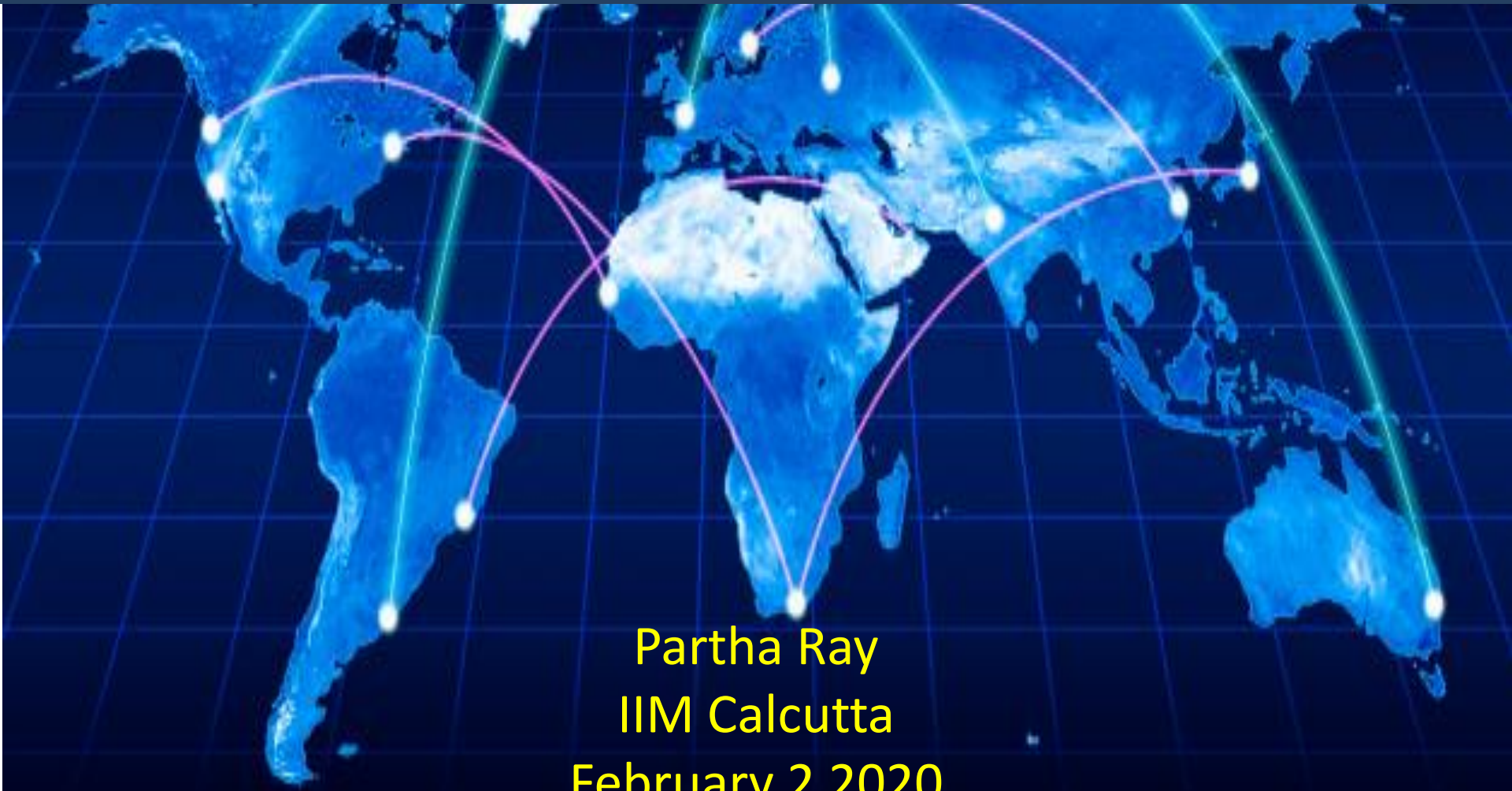# Market Economies and Macroeconomic Policies SMP 16
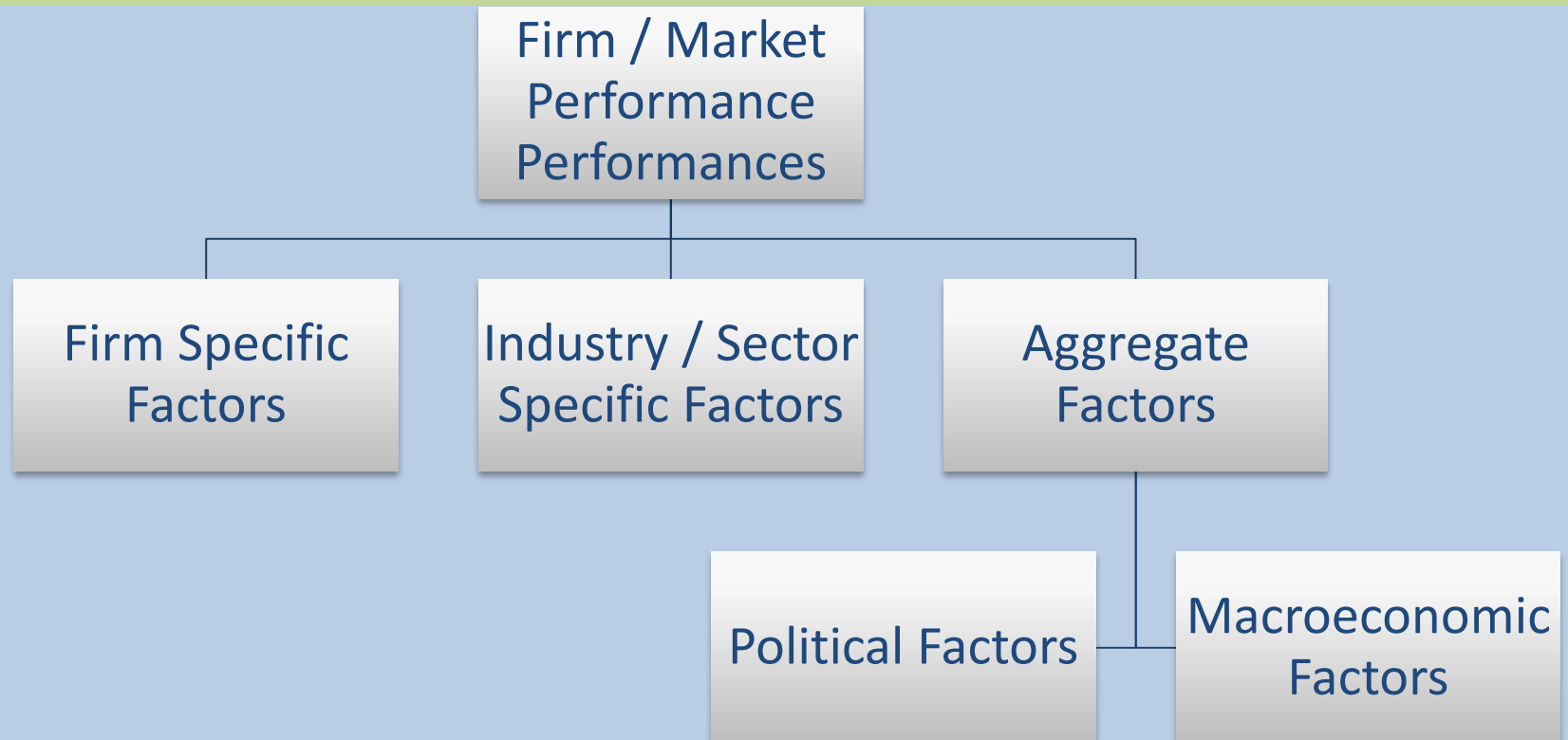
Partha Ray

IIM Calcutta

February 2 2020

Motivation

Why is it Important for Business Managers to know Market Economies and Macroeconomic Policies (You know it but let me remind you)

Motivation

Corporate Performance is outcome of Three Forces

Firm / Market Performance Performances

Firm Specific Factors

Industry / Sector Specific Factors

Aggregate Factors

Political Factors

Macroeconomic Factors

Global Political Economy is excepted to provide the distant vision

Role of Headwinds & Tailwinds in Flying Time

"A tailwind is a wind that blows in the direction of travel of an object, while a headwind blows against the direction of travel. A tailwind increases the object's speed and reduces the time required to reach its destination, while a headwind has the opposite effect."

- Normal flying time from New York to London: around 8 hours
- "5 hours 13 minutes: Airline flies New York to London in record time …the good time came thanks to better than expected **weather conditions** and hefty **tail wind**" – Bloomberg, Jan 22, 2018

low interest rates

rising rental rates

pent-up demand

improving household balance sheet

employment trends

low consumer confidence

tight lending standards

policy issues

Three ways of seeing this module

EA Syndrome

Your Exec Asst is briefing you about the Economy

Icing on the Cake Syndrome

You know how corporate world work, but in presenting your views, making some comments on the Economy make these more presentable
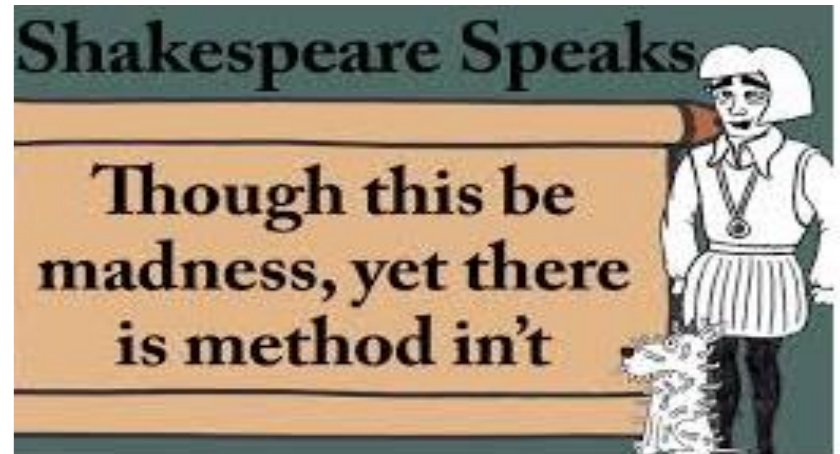
Business Context Syndrome

Economy sets the context of Business

VUCA: Finding A Method in Madness

- **Tracking Global Economic Trends**
- **Sharing Collective Confusion**
- **Finding a Way in VUCA World**

...THWAP THWAP THWAP...

VOLATILITY

Shakespeare Speaks

Though this be madness, yet there is method in't

Methodology of the Lecture

"**If you Torture the data enough, it will confess to anything.**" - **Ronald Coase, Nobel Laureate in Economics in 1991**

Facts / Data

Analysis

~~**Opinion**~~
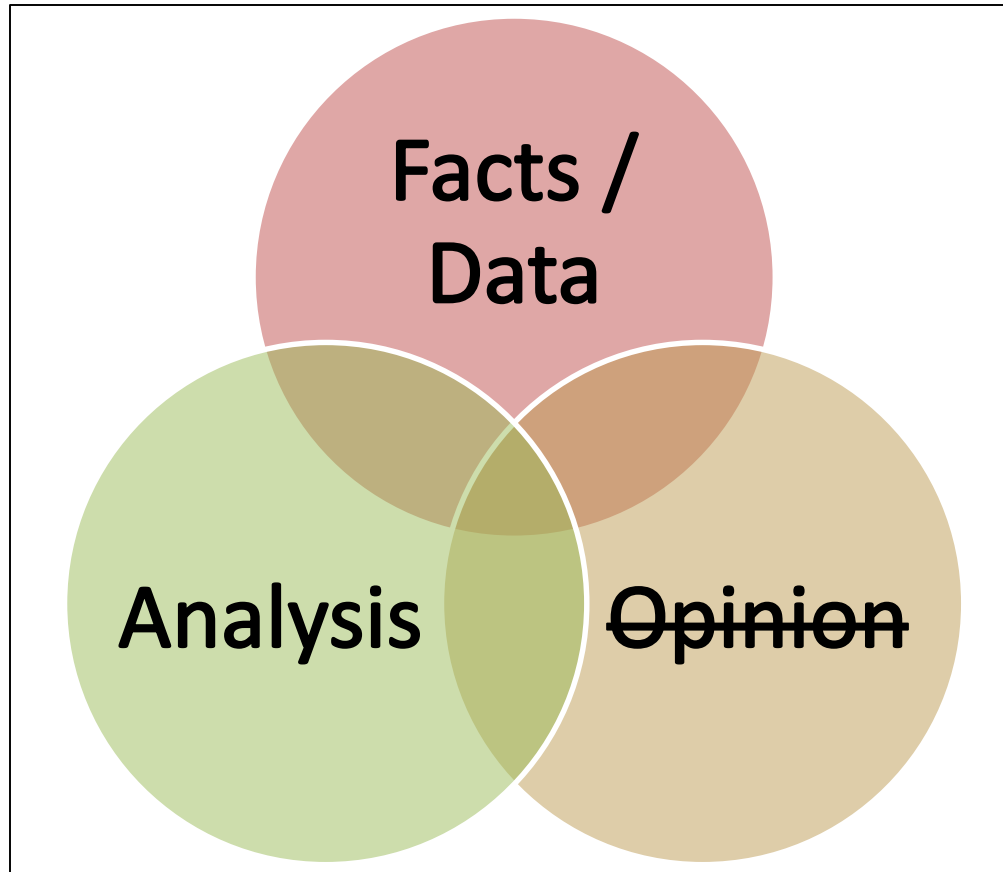
"**It is wrong to have an ideal view of the world. That's where the mischief starts. That's where everything starts unravelling.**"- **V S Naipaul**

Components of a Global Mindset?

- In a review of the literature on global leadership competencies, Beechler and Javidan (2007) concluded,

  "the list of effective global leadership competencies are practically endless, to the point in which they become useless".

- In order to address this issue, they identify the following three critical components of a global mind-set essential for global leadership:

  - Intellectual Capital;
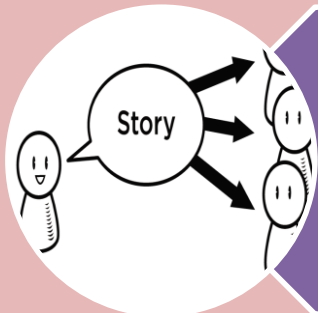 - Psychological Capital; and
  - Social Capital

Locating in Your Economics Module

Alphabets & Words: Microeconomics

Grammar: Macroeconomics

Story: India and the Global Economy

Scheme of the Module

Date	Session No.	Topic
Feb 2 2020	1	Microeconomics
Feb 23 2020	2	Closed Economy Macroeconomics
Mar 1 2020	3	Open Economy Macroeconomics
Mar 8 2020	4	Global Economy: USA & other G-7 countries - and China (including Trade War)
Mar 15 2020	5	Indian Economy 1
Mar 22 2020	6	Indian Economy 2

Session 1
Microeconomics

Problem of Causality in Business Analysis

- Fallacy of "After this therefore because of this"
- Economic Models try to help this out
  - Logical explanation of Business / Economic Phenomenon
- Theoretical versus Empirical Explanation
- Notion of Granger Causality

Method

- **We use the understanding to measure and compare performance, suggest policies, make forecasts.**
- **The method of comparative statics**
- **Restrictive assumptions can be removed gradually, and models made more complicated**
- **Simplifying assumptions to focus on some fundamental relationships in a very complex world**
- **Exogenous and endogenous variables**
- **Results are contingent on assumptions**
- **Solutions**

SIMPLE MODELS FOR A COMPLEX WORLD

- **Simplifying assumptions to focus on some fundamental relationships in a very complex world**

- **Exogenous and endogenous variables**

- **Results are contingent on assumptions**

- **Solutions**

What is an Economic Model?

- An economic model is different from a chronicle of a macroeconomic event;

- It should not give us laundry list of innumerable reasons / happenings to explain an economic phenomenon.

- Professor Avinash Dixit of Princeton University has put it aptly in a recent lecture:

  "The art of scientific research differs from that of writing, painting, music etc. In the art of research, creativity cannot be free and unfettered; it is constrained by facts. You cannot have "surrealistic" science that violates reality. However, reality is complex, and its understanding is not always or even often best achieved by full detailed description. Art therefore enters the choice of what to include and what to leave out of one's analysis. It also enters the choice of techniques to use in the analysis. In theoretical modeling, …. this can be various mathematical methods (algebra, geometry, calculus, etc.), and sometimes just plain words" (Dixit, 2015).

- A theoretical macroeconomic model is, thus, a causal story.

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Economic Models

Exogenous Variables → Model → Endogenous Variables

How Models Work Models are simplified theories that show the key relationships among economic variables. The exogenous variables are those that come from outside the model. The endogenous variables are those that the model explains. The model shows how changes in the exogenous variables affect the endogenous variables.

What's the difference between Microeconomics & Macroeconomics?

- **Microeconomics** examines small economic units, the components of the economy.
- For example: individuals, households, firms, industries
- **Macroeconomics** looks at aggregates.
- For example: national output, overall price level, aggregate unemployment

When developing a model, some simplifying *assumptions* are usually made.

- The assumptions should be easy to handle, sufficiently realistic, and not overly restrictive.
- Without the simplifying assumptions, the analysis can be unmanageable.
- If the assumptions are overly simplistic, the model may fail to explain real-life behavior.
- The test of a theory is whether it explains what it is designed to explain. The predictions should be consistent with reality.
- The world acts **as if** the assumptions held.
- The assumptions need not hold precisely.

Mankiw's 10 Principles:
A Digression

Mankiw's Principles – Select ones

1. People Face Tradeoffs

- Scarcity
- Leisure time vs. coming to class
- Efficiency vs. Equity

2. The Cost of something is What you **Give Up** to get it

- Opportunity Cost = Implicit Cost + Explicit Cost

3. Rational People think at the Margin

- What is the margin
- Marginal cost
- Marginal Benefits
- Examples
- Who are "rational" people?
  - Homoeconomicus

4. People Respond to Incentives

- Behaviour changes when cost or benefits change

5.Trade can make everyone better off

- Benefits of specialising
- Wider range of choice

6. Economic Activity takes place through markets

- Invisible hand
- Alternate: central planning

7. Governments can intervene to change market outcomes

- Efficient Resource Allocation
- Public Policy
- Market Failure
  - Externality
  - Market Power

Thinking like an Economist

- Terminology
  - supply ❖ opportunity cost ❖ elasticity ❖ consumer surplus ❖ demand ❖ comparative advantage ❖ deadweight loss
- What:
  - Think in terms of alternatives.
  - Evaluate the cost of individual and social choices.
  - Examine and understand how certain events and issues are related.

- How:
  - Develop abstract models to simulate real world
  - Develop theories, use data to test them
  - Make appropriate assumptions to understand specific situations

- Two models
  - Circular Flow
  - Production Possibilities Frontier

Microeconomics

What is a *market*?

- The interaction of buyers & sellers of a good or service

Questions relevant to <u>all</u> economies, market-oriented or not

1. What goods & services should be produced and how much?

2. How should the goods & services be produced?

3. Who gets the goods & services?

4. How do changes in the production & distribution mixes take place?

In a market economy, these questions are handled by the market.

- What & how much to produce:
  determined by demand & supply conditions, individual choices, & pursuit of profit.

- How to produce:
  determined by technology & resource costs.

- Distribution:
  based on ability & willingness to pay the price.

- What if consumer wants or technology change?
  Those changes alter demand & supply, which changes prices, profits, & consequently output levels & distribution.

The market is not the only way that the basic questions of economics can be answered.

- In some less developed nations, a **traditional economic system** is used.
- Custom & tradition determine the answers.
- Social arrangements & culture dictate the solutions.
- Change occurs only very gradually.

Historically the former Soviet Union had a **command economy**.

•Resources are government/publicly owned and centralized control is used to determine what is produced, how it is produced, and how it is distributed.

No country in the world has
a purely market or purely command economy.

- They have mixed economies with both market and government sectors.
- In this course, we will deal primarily with the market system.

Global Market Place

- Not limited to geographical location
- Global supply chain
- Enhanced by forces of globalization
  - Fall in Iron Curtain
  - Birth of WTO
  - Fall in transport cost
  - Improvement in Communication technology

The Market: Supply and Demand

What is the law of demand?

- The lower the price of a good, the larger the quantity consumers will buy.

- So the demand curve slopes downward from left to right.

What is the difference between *demand* & *quantity demanded*?

- *Demand* is the entire curve that shows the relation between price & quantity purchased.
- *Quantity demanded* is one particular quantity on the demand curve.

Example: Apple Market

Price of apples
(in dollars)

The demand for apples is the curve **D**.

The quantity demanded of apples when the price is 25 cents is 6 thousand bushels.

$ 0.25

D
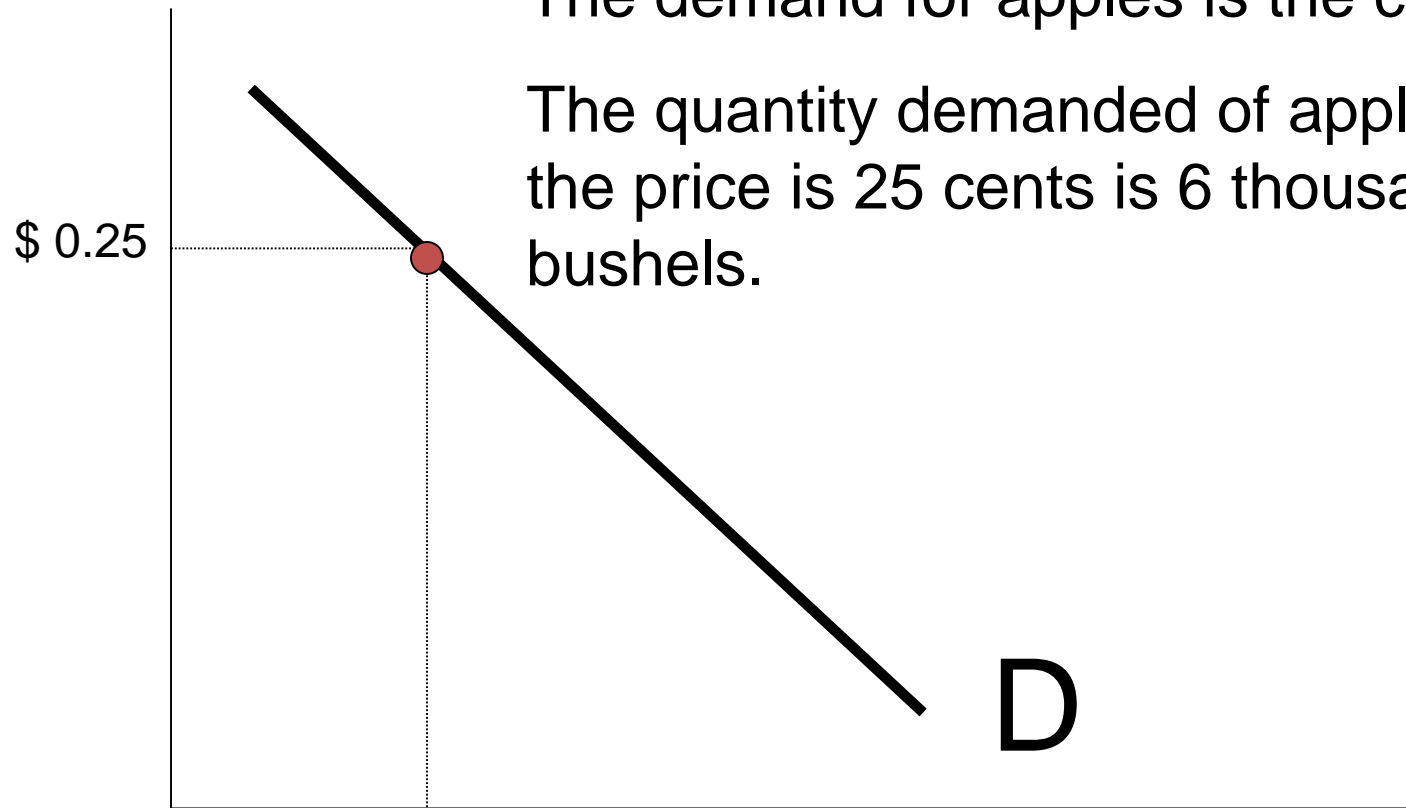
6

Quantity of apples
(in thousands of bushels)

What factors change demand (that is, shift the entire curve)?

1. Consumer income
2. Prices of substitutes and complements
3. Tastes
4. Consumer expectations

Example: Apple Market

Price of apples
(in dollars)

If income increases, people will buy more apples at every price & the entire curve will shift to the right.

D_2

D_1
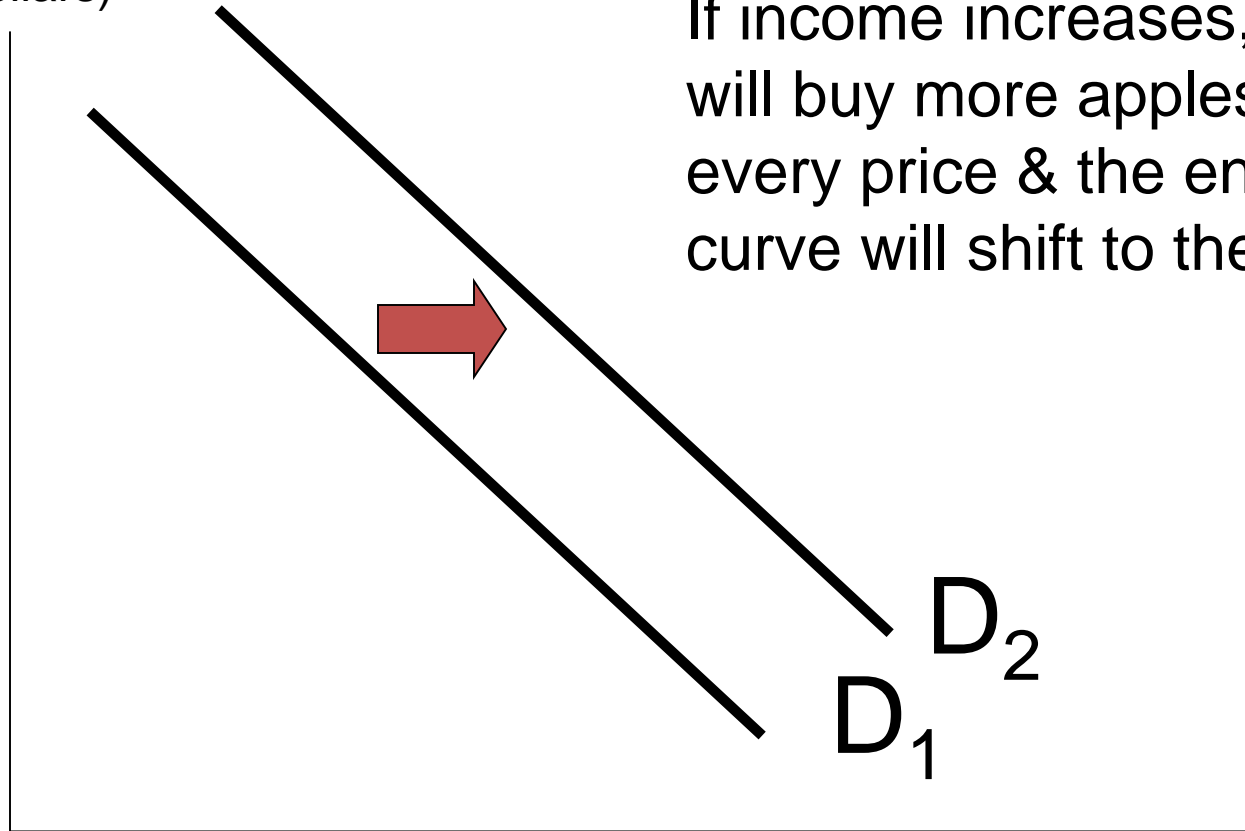
Quantity of apples
(in thousands of bushels)

What makes the quantity demanded of apples change?

- In other words, what causes a movement along the demand curve for apples?
- A change in the price of apples.
- That's it, only a change in the price of apples.

Example: Apple Market

Price of apples
(in dollars)

Suppose the price of apples falls from 25 cents to 20 cents.

Then the quantity demanded of apples rises from 6 thousand bushels to 8 thousand bushels.

$ 0.25

$ 0.20

D

6   8   Quantity of apples
(in thousands of bushels)
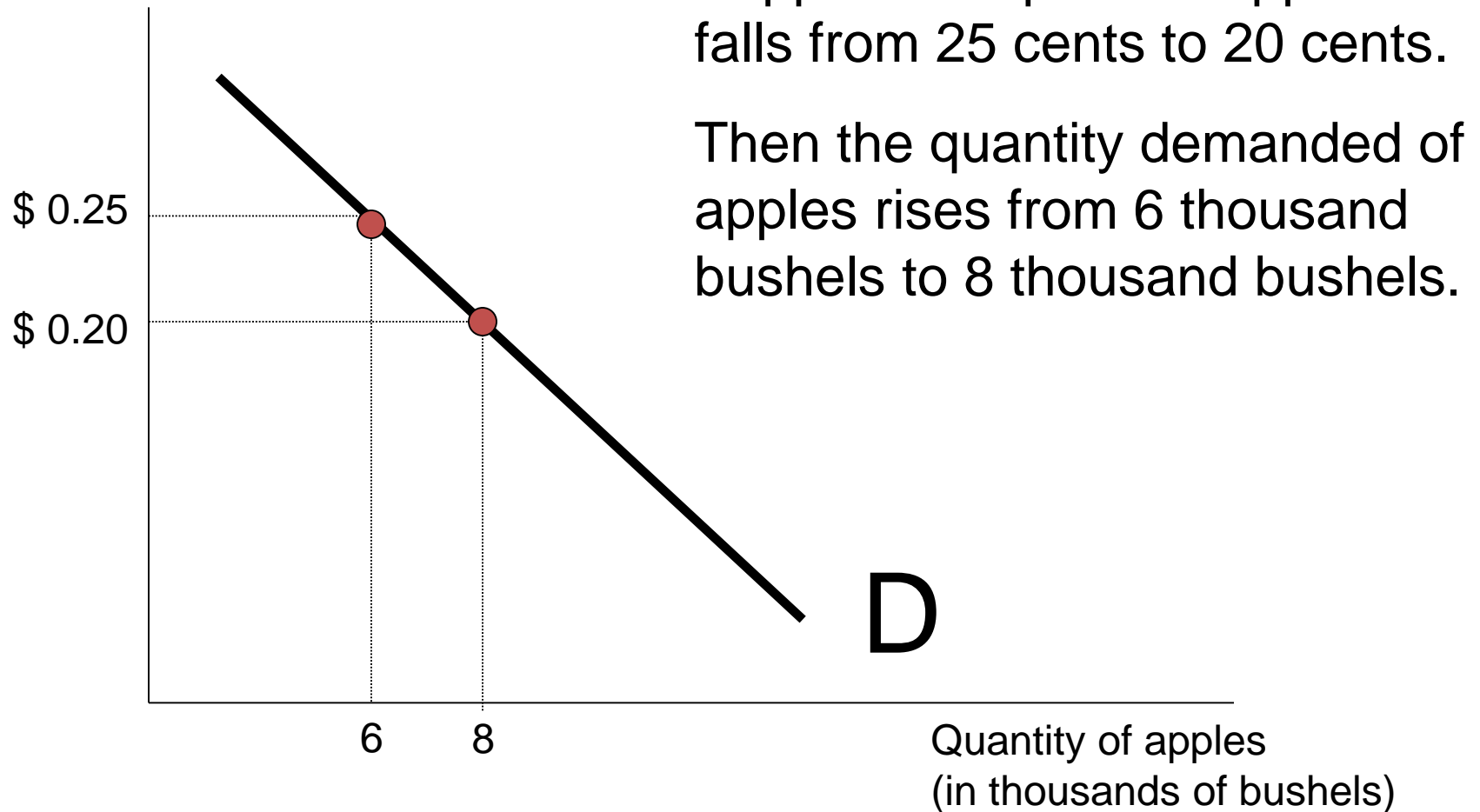
What is the law of supply?

- The higher the price of a good, the larger the quantity firms will be willing to produce and sell.

- So the supply curve slopes upward from left to right.

What is the difference between *supply* & *quantity supplied*?

- *Supply* is the entire curve that shows the relation between price & quantity provided.

- *Quantity supplied* is one particular quantity on the supply curve.

Example: Apple Market

Price of apples
(in dollars)

S

$ 0.22

The supply of apples is the curve **S**.

The quantity supplied of apples when the price is 22 cents is 7 thousand bushels.

7

Quantity of apples
(in thousands of bushels)
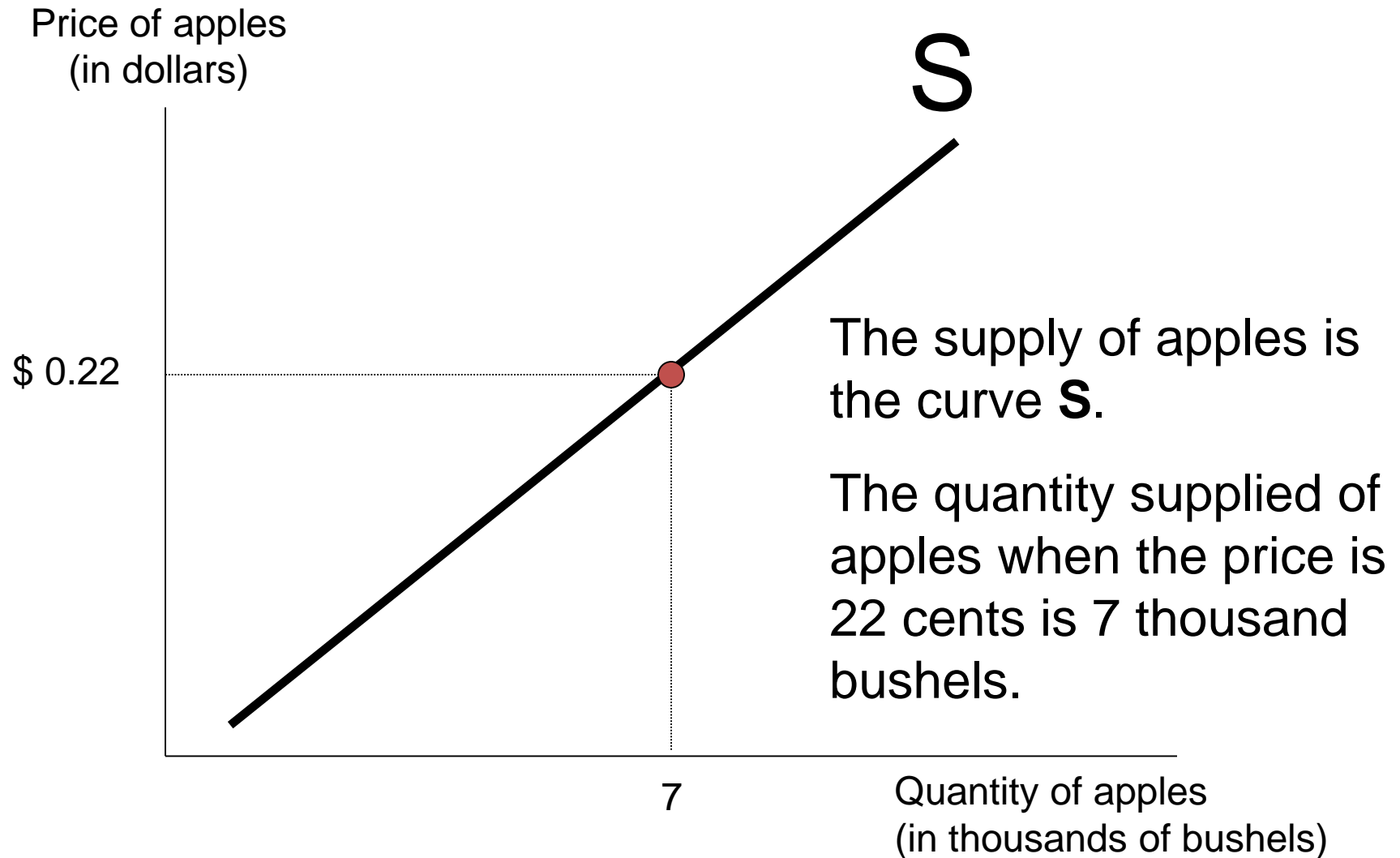
What factors change supply (that is, shift the entire curve)?

1. Technology
2. Prices of inputs (for example: land, labor, machinery, raw materials)
3. Weather (in the case of agriculture)

Example: Apple Market

Price of apples
(in dollars)

S_2

S_1
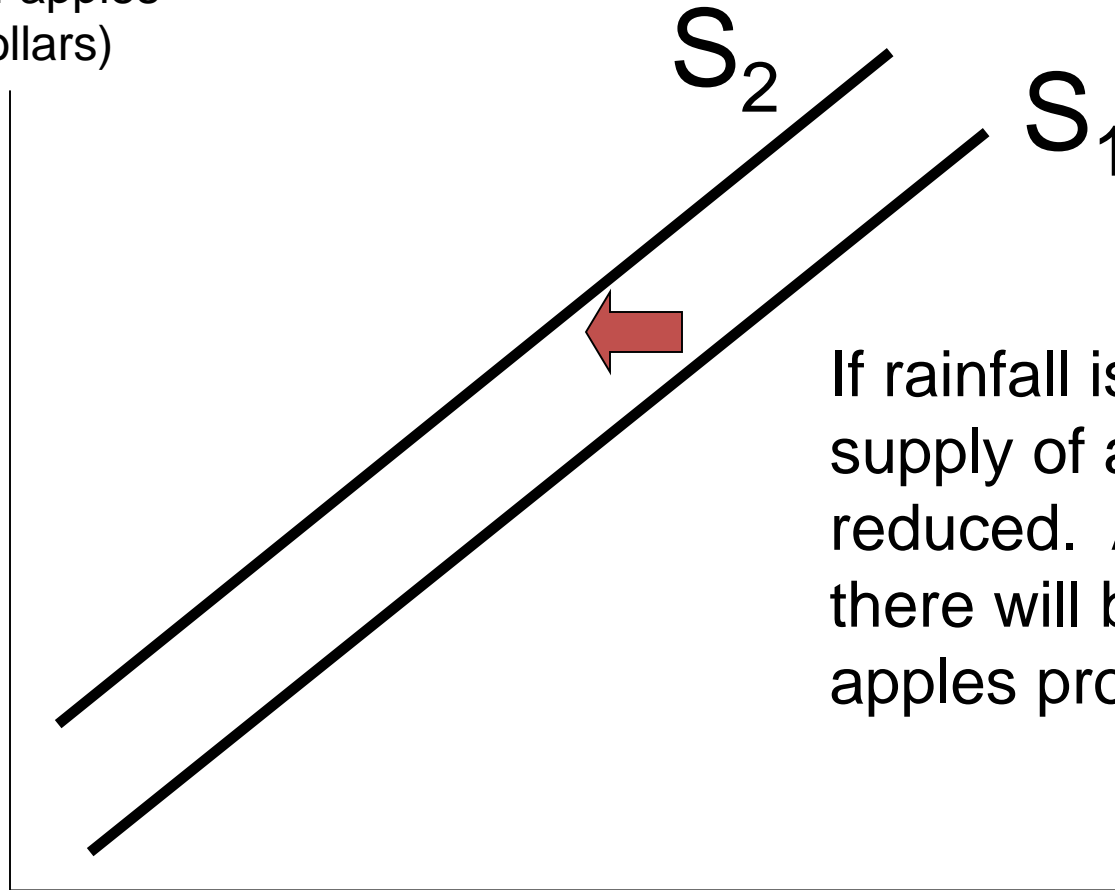
If rainfall is low, the supply of apples will be reduced. At each price, there will be fewer apples provided.

Quantity of apples
(in thousands of bushels)

What makes the quantity supplied of apples change?

- What causes a movement along the supply curve for apples?

- Just a change in the price of apples.

Example: Apple Market

Price of apples
(in dollars)

S

$ 0.22

$ 0.20

When the price of apples falls from 22 cents to 20 cents, the amount provided falls from 7 thousand bushels to 6 thousand bushels.

6   7

Quantity of apples
(in thousands of bushels)
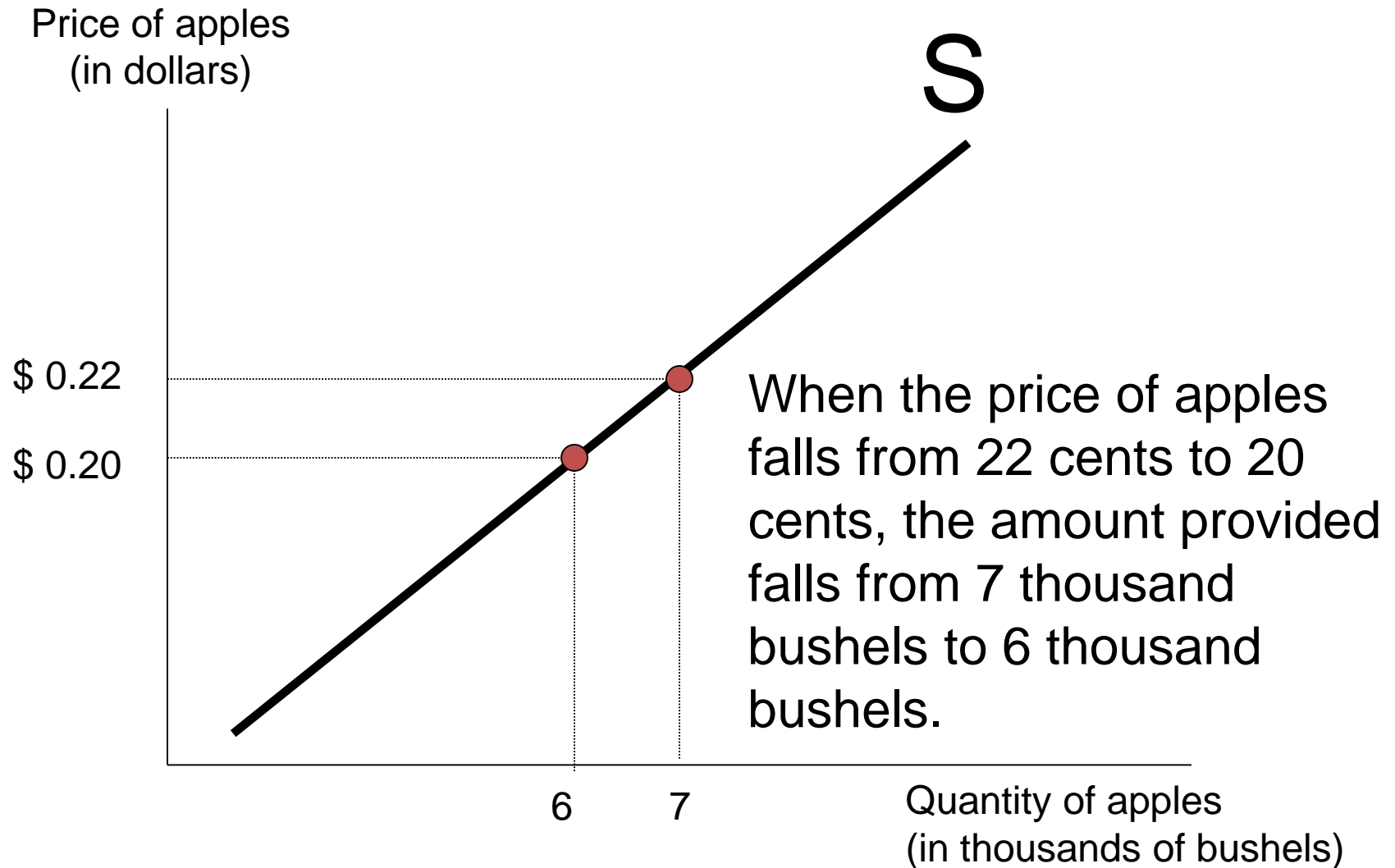
What is equilibrium?

- It is a state of balance, where there is no tendency for things to change.

P	Q_D	Q_S	condition	price pressure
0.25	6	8	excess supply	⬇
0.22	7	7	$Q_D = Q_S$	0
0.20	8	6	excess demand	⬆

Equilibrium occurs where the quantity demanded equals the quantity supplied, which is at the intersection of the supply and demand curves.

Example: Apple Market

Price of apples
(in dollars)

S

$ 0.22 ┄┄┄┄┄┄┄┄┄┄

Here the equilibrium price is 22 cents & the equilibrium quantity is 7 thousand bushels.

D

7

Quantity of apples
(in thousands of bushels)
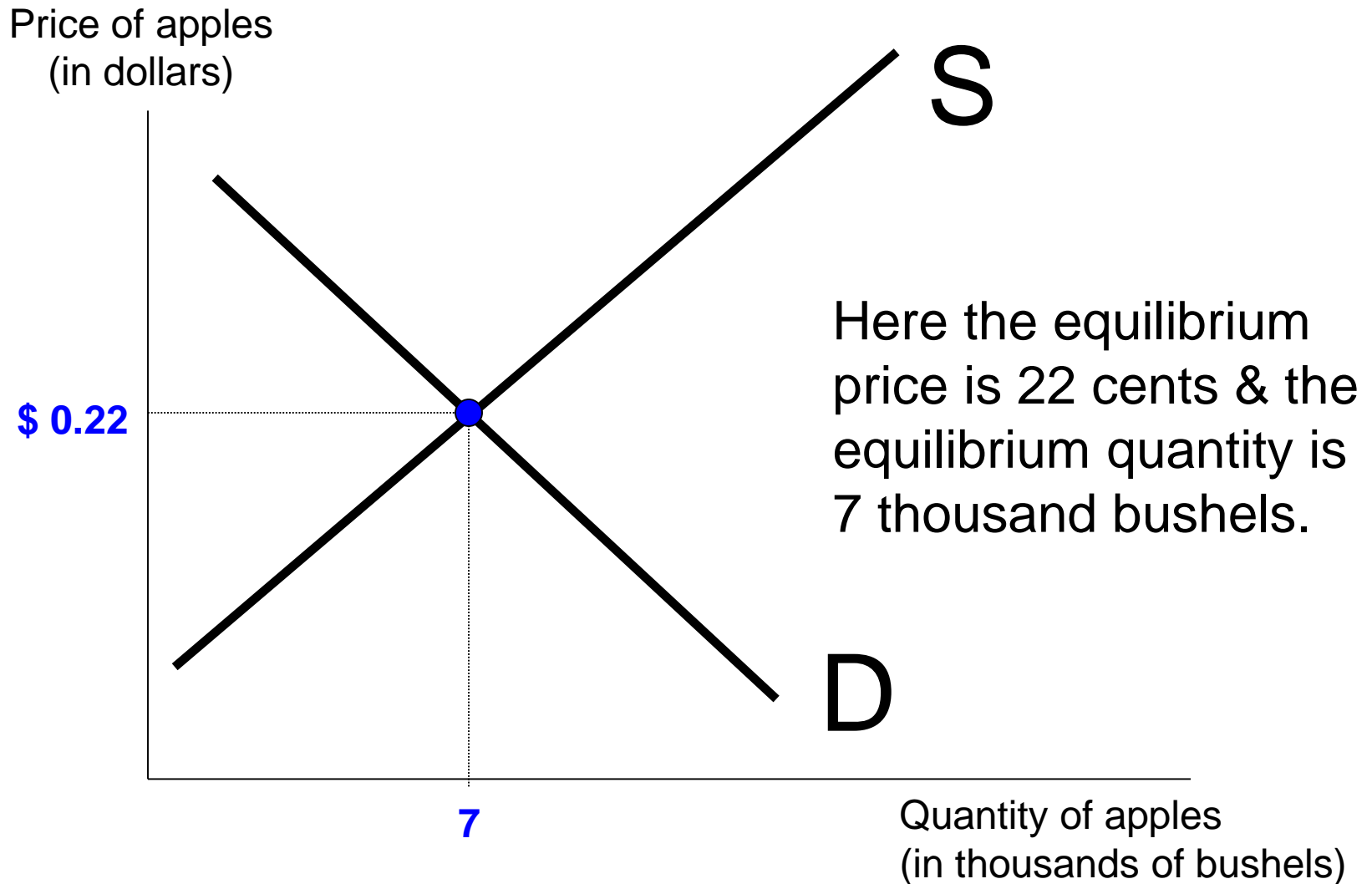
Suppose there is an increase in the price of pears (a substitute for apples). Then the demand for apples will increase. Equilibrium price increases & equilibrium quantity increases.
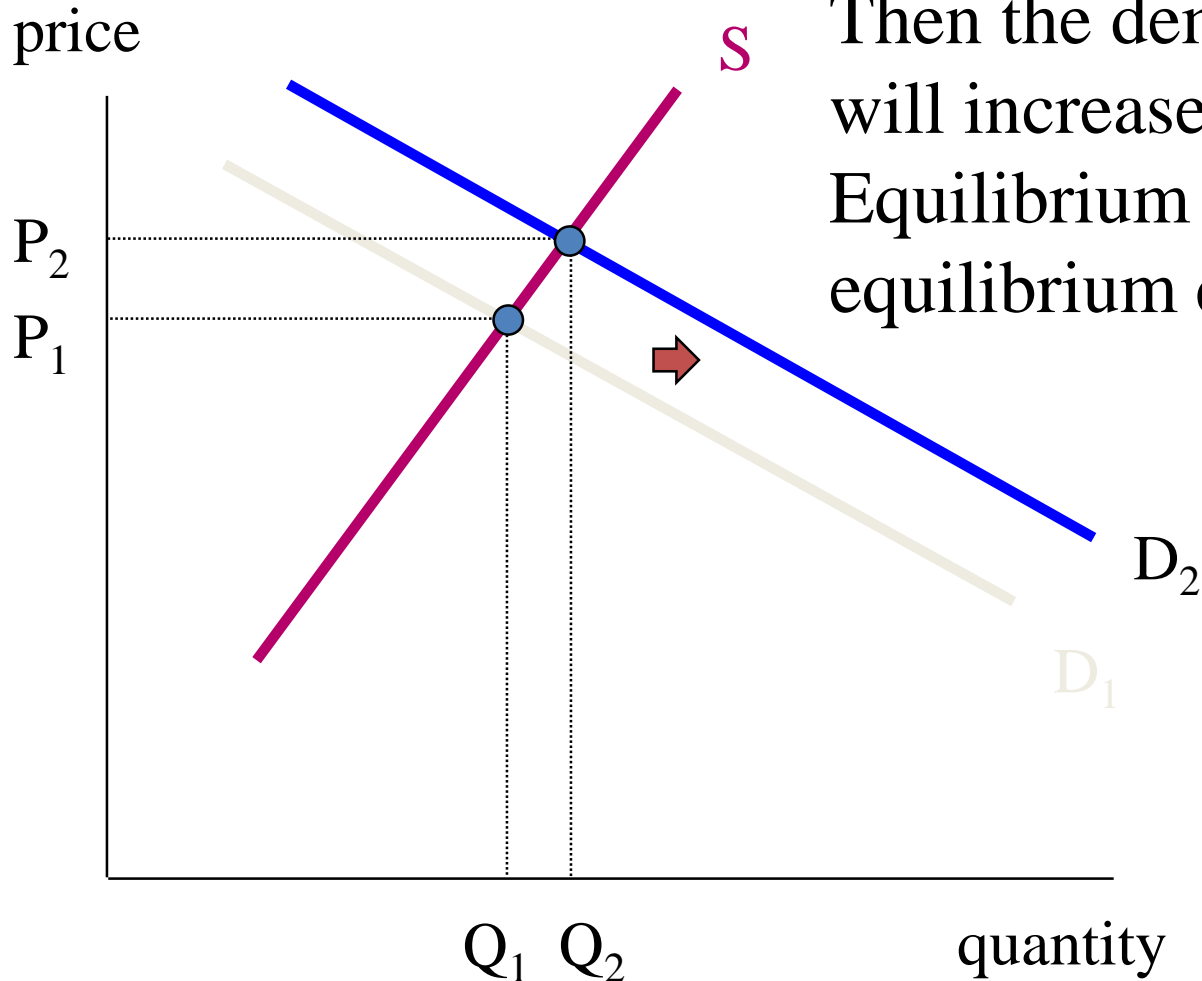
Suppose there is a long spell of bad weather for apple growing.
Then the supply of apples will decrease.
Equilibrium price increases & equilibrium quantity decreases.
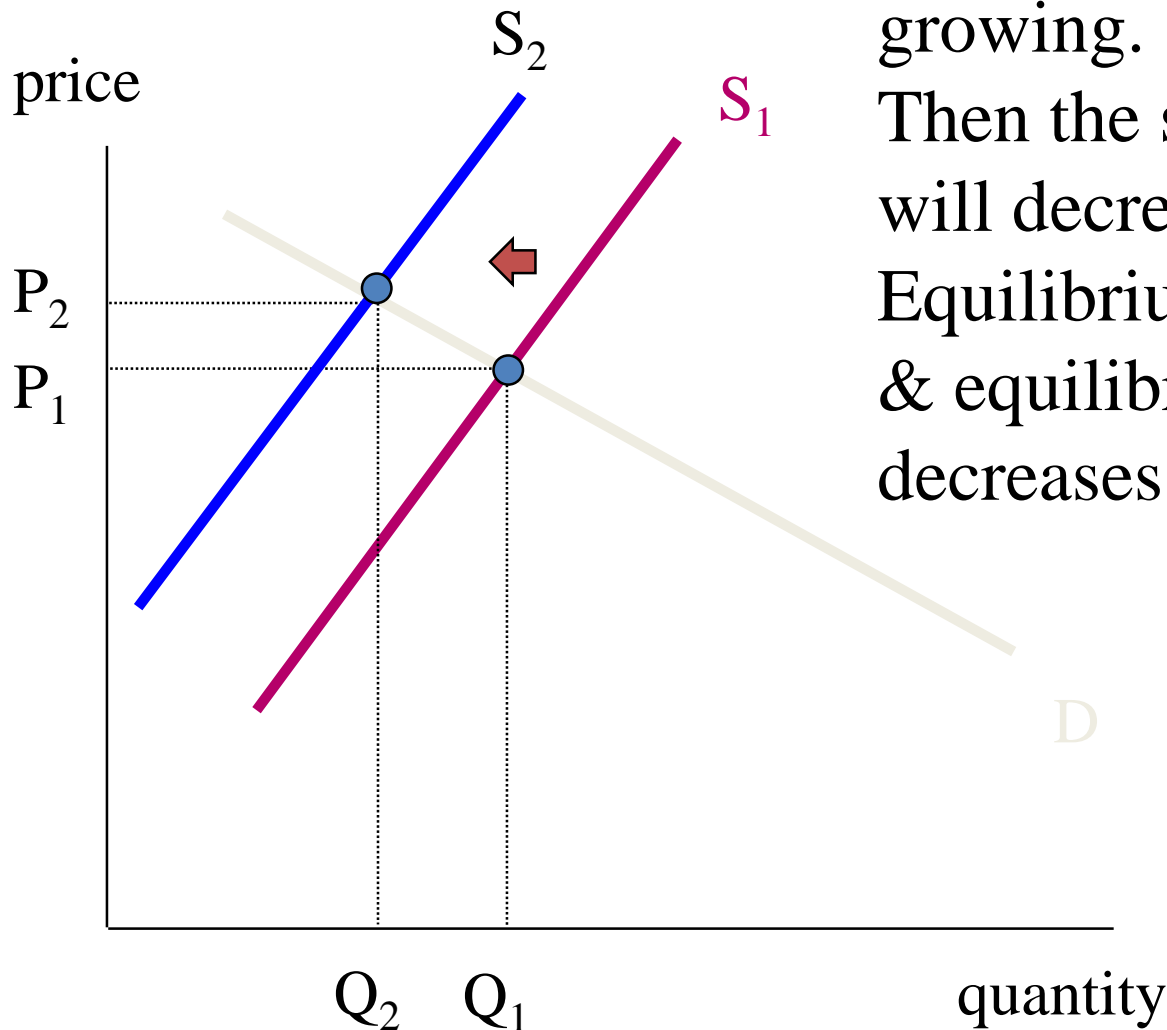
Determining Equilibrium Price and Quantity from Supply and Demand Equations

Consider the market for jeans. Suppose the equation of the supply curve is P = 4 + 8Q. The equation of the demand curve is P = 24 – 2Q. (The price is in dollars and the quantity is in thousands of pairs of jeans.) Determine the equilibrium price and quantity.

The equilibrium is at the intersection of the supply and demand curves. So the P's are the same and the Q's are the same.

Equate the P's and solve.

4 + 8Q = 24 – 2Q.

10Q = 20

Q = 2

Plugging into either equation, we get P = 20.

The graph of the previous problem is as follows:

Price ($)

24

S: $P = 4 + 8Q$

P* = 20

D: $P = 24 - 2Q$

4

Q* = 2

Quantity
(thousands of pairs of jeans)
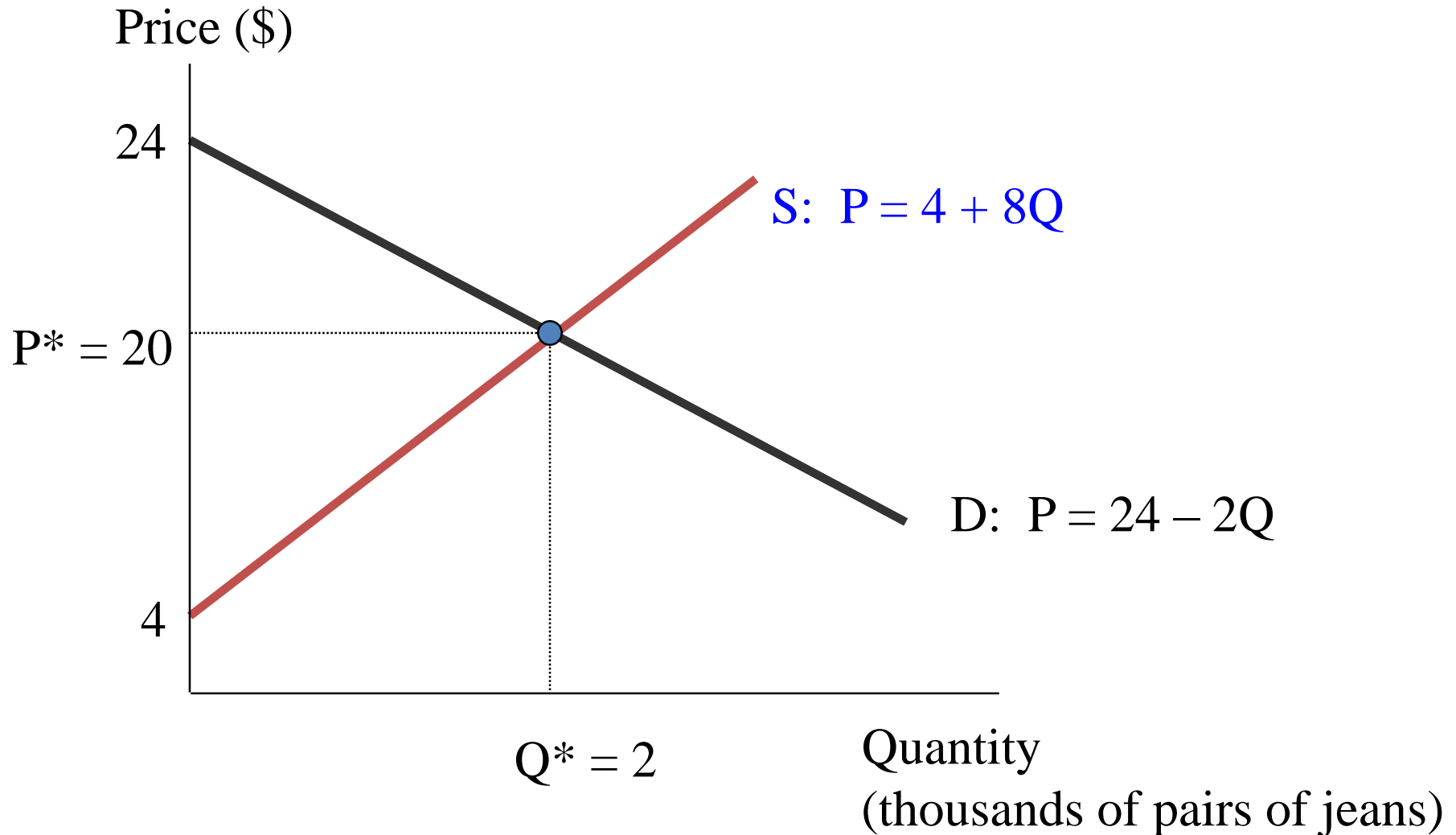
Demand Analysis

Elasticity . . .

◆ … is a measure of how much buyers and sellers respond to changes in market conditions

◆ … allows us to analyze supply and demand with greater precision.

◆ Question-Name 3 necessities and 3 luxuries that you would buy.

Price Elasticity of Demand

◆**Price elasticity of demand** is the percentage change in quantity demanded given a percent change in the price.

◆It is a measure of how much the quantity demanded of a good responds to a change in the price of that good.

Computing the Price Elasticity of Demand

The price elasticity of demand is computed as the percentage change in the quantity demanded divided by the percentage change in price.

Price Elasticity   =   Percentage Change in Quantity demanded
Of Demand   Percentage Change in Price

Elasticity, Percentage Change and Slope

Because the price elasticity of demand measures how much quantity demanded responds to the price, it is closely related to the slope of the demand curve.

But instead of looking at unit change, elasticity looks at percentage change. What do we mean by percentage change?

Brief Assessment on Percentages

- If there are 50 tomatoes in a store and you picked 16 of them, what percentage of the total did you pick?

- Paul used to weigh 200 lbs last year, but now he only weighs 175 lbs. How many lbs did he lose? What is the percent change of the loss?

- What is the average of 300 and 330? What is the midpoint?

Computing the Price Elasticity of Demand

$$Price\ elasticity\ of\ demand = \frac{Percentage\ change\ in\ quatity\ demanded}{Percentage\ change\ in\ price}$$

Example: If the price of an ice cream cone increases from $2.00 to $2.20 and the amount you buy falls from 10 to 8 cones then your elasticity of demand would be calculated as:

$$\frac{\dfrac{(10-8)}{10} \times 100}{\dfrac{(2.20-2.00)}{2.00} \times 100} = \frac{20\ percent}{10\ percent} = 2$$

Computing the Price Elasticity of Demand Using the Midpoint Formula

The midpoint formula is preferable when calculating the price elasticity of demand because it gives the same answer regardless of the direction of the change.

$$\textbf{Price Elasticity of Demand} = \frac{(Q_2 - Q_1)/[(Q_2 + Q_1)/2]}{(P_2 - P_1)/[(P_2 + P_1)/2]}$$

Computing the Price Elasticity of Demand

$$\text{Price Elasticity of Demand} = \frac{(Q_2 - Q_1)/[(Q_2 + Q_1)/2]}{(P_2 - P_1)/[(P_2 + P_1)/2]}$$

Example: If the price of an ice cream cone increases from \$2.00 to \$2.20 and the amount you buy falls from 10 to 8 cones the your elasticity of demand, using the midpoint formula, would be calculated as:

$$\frac{\dfrac{(10-8)}{(10+8)/2}}{\dfrac{(2.20-2.00)}{(2.00+2.20)/2}} = \frac{22\ percent}{9.5\ percent} = 2.32$$

Ranges of Elasticity

Inelastic Demand

◆ Percentage change in price is greater than percentage change in quantity demand.

◆ Price elasticity of demand is *less than* one.

Elastic Demand

◆ Percentage change in quantity demand is greater than percentage change in price.

◆ Price elasticity of demand is *greater than* one.
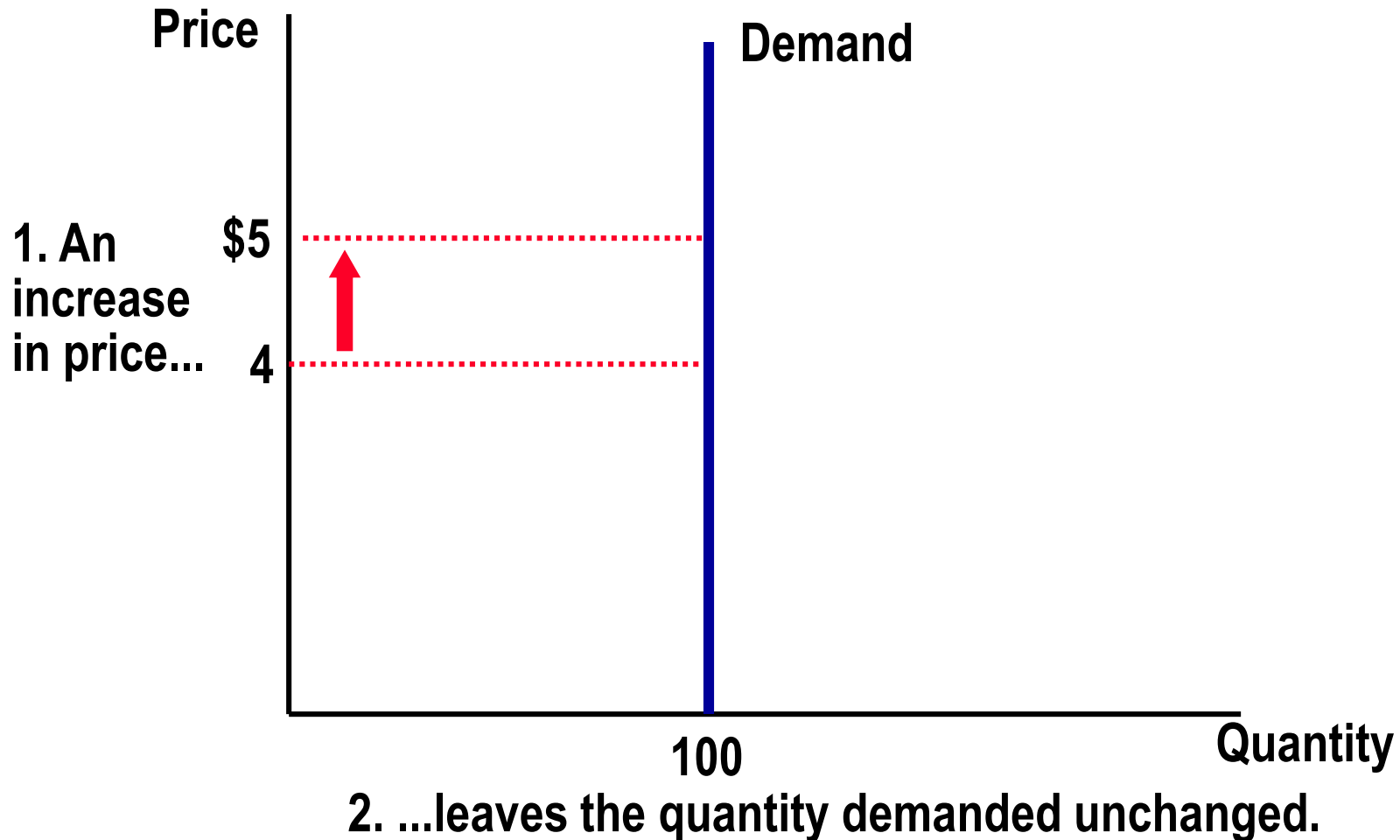
Inelastic Demand
- Elasticity is less than 1

Price

1. A 25% increase in price...

$5

4

Demand

90   **100**

Quantity

2. ...leads to a 10% decrease in quantity.

Unit Elastic Demand
- Elasticity equals 1

Price

1. A 25% increase in price...

$5

4

Demand

75   **100**

Quantity

2. ...leads to a 25% decrease in quantity.
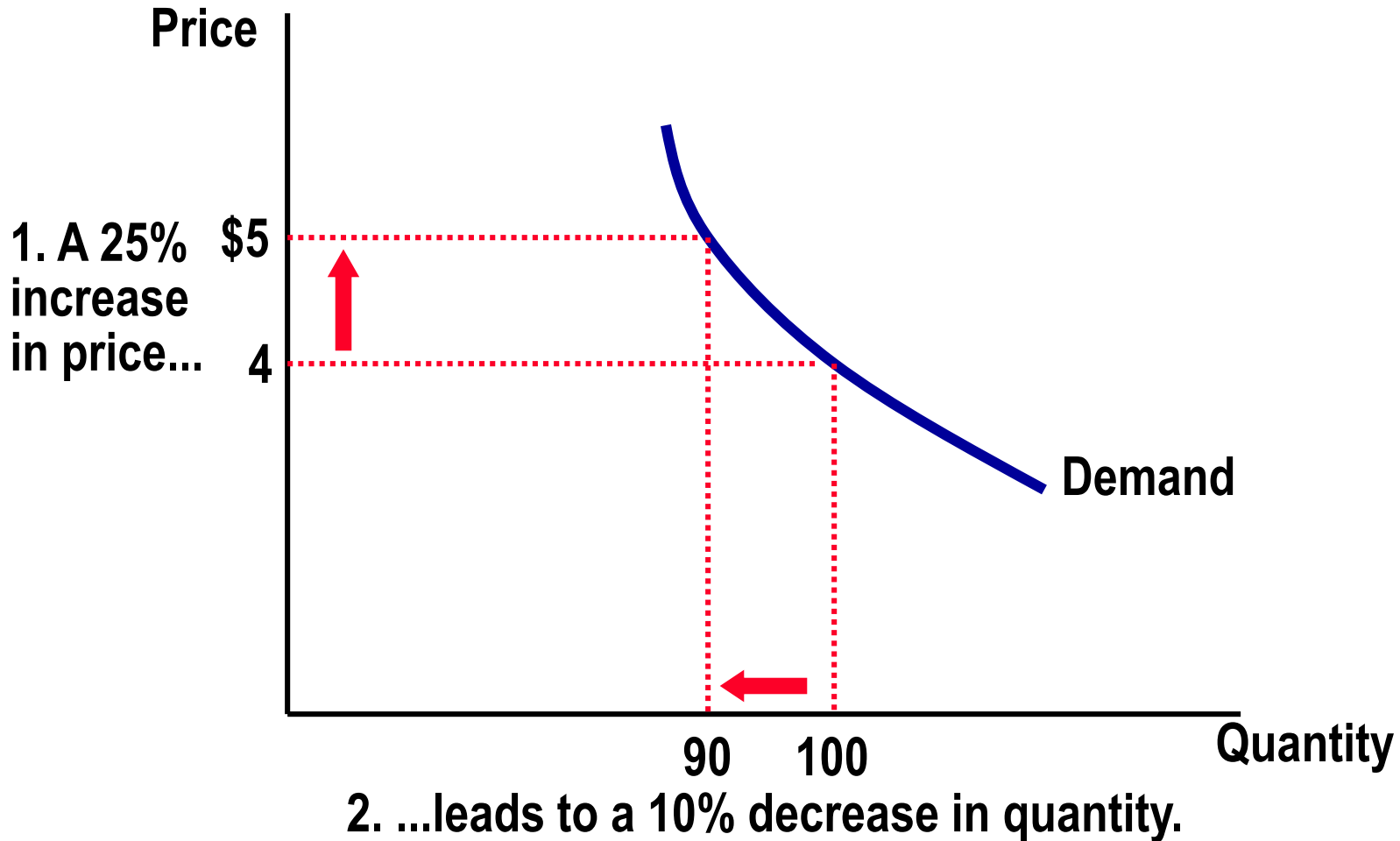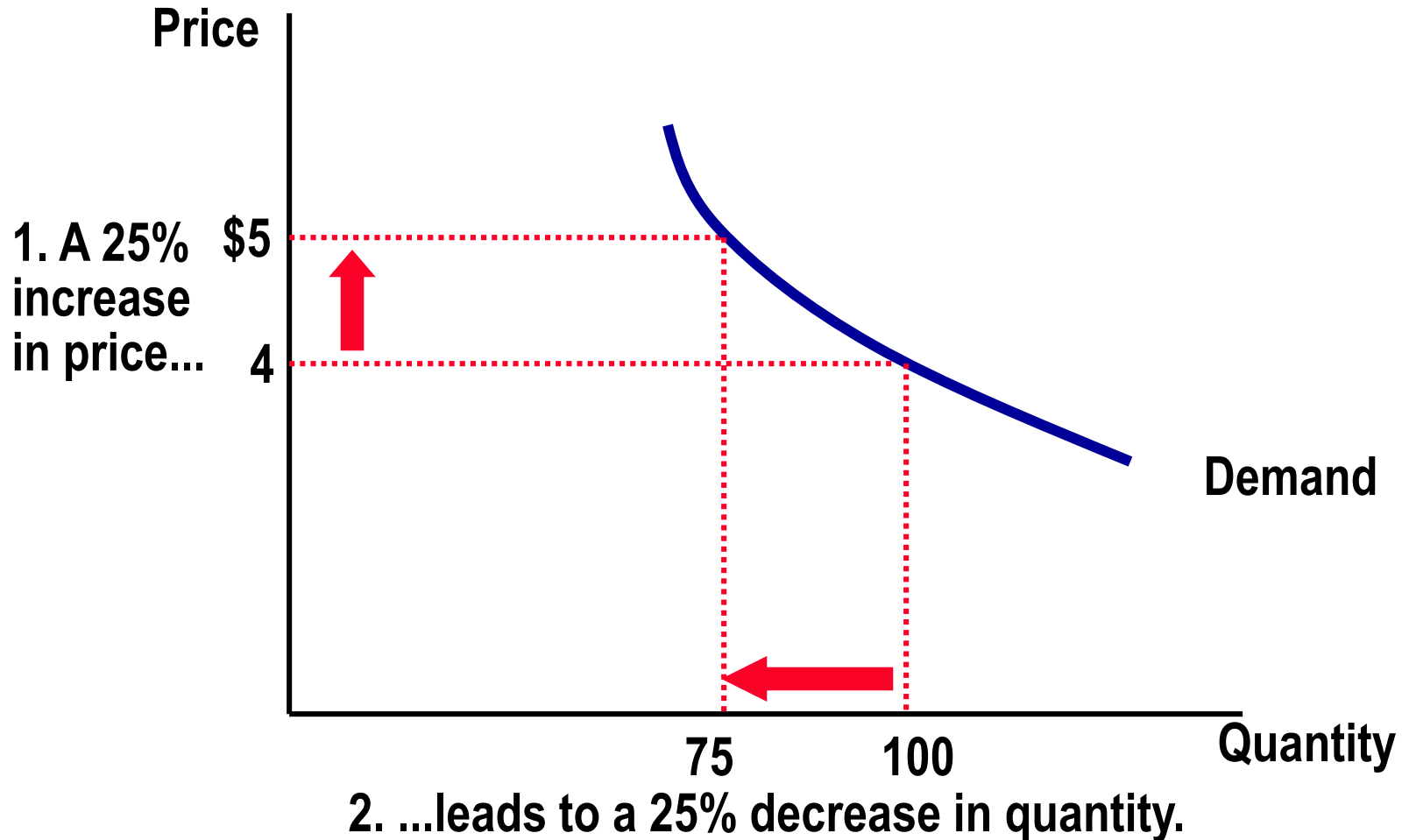
Elastic Demand
- Elasticity is greater than 1

Price

1. A 25% increase in price...

$5

4

Demand

50   100   **Quantity**

2. ...leads to a 50% decrease in quantity.
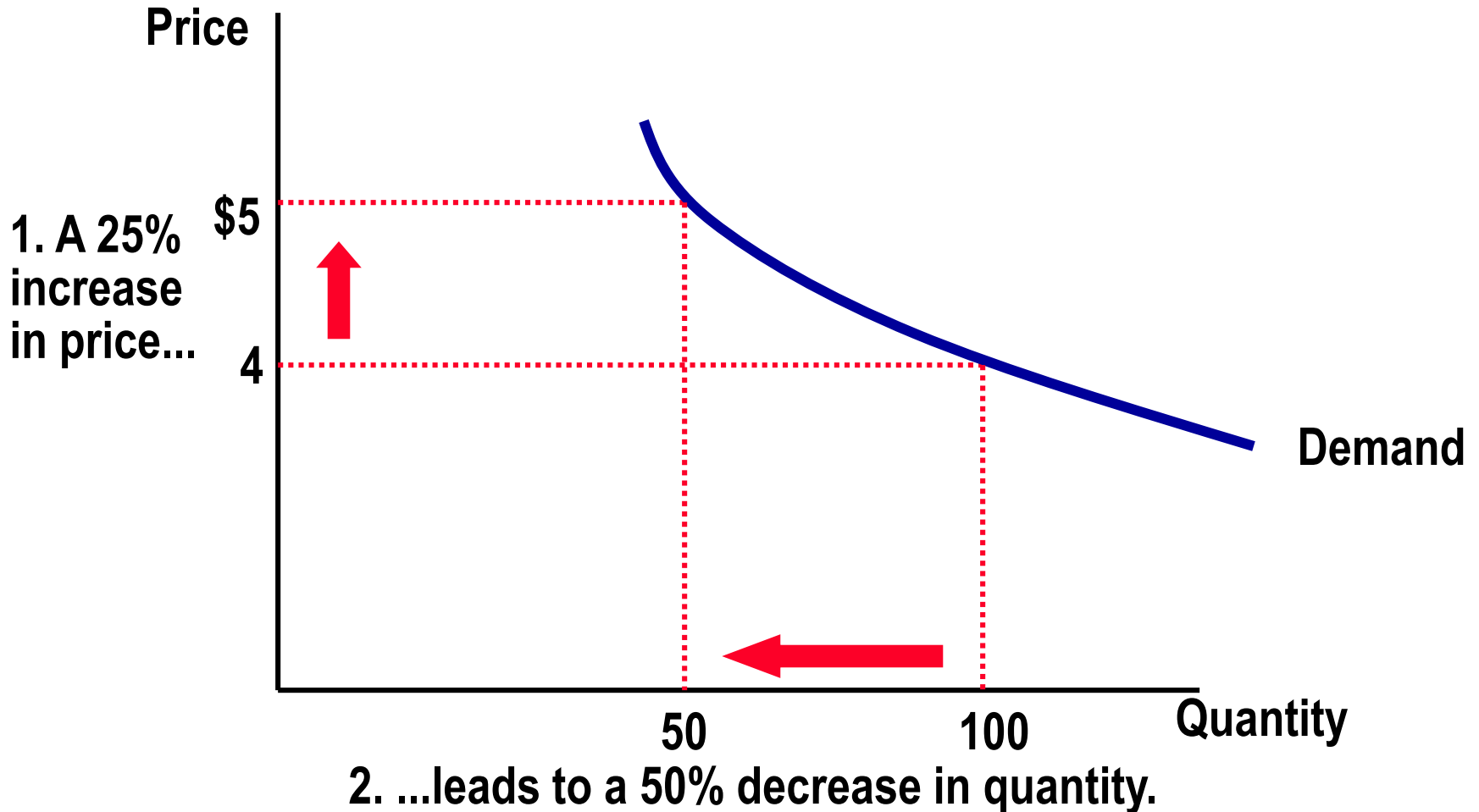
Perfectly Elastic Demand
- Elasticity equals infinity

Price

1. At any price above $4, quantity demanded is zero.

$4 ────────────────────────── **Demand**

2. At exactly $4, consumers will buy any quantity.

Quantity

3. At a price below $4, quantity demanded is infinite.
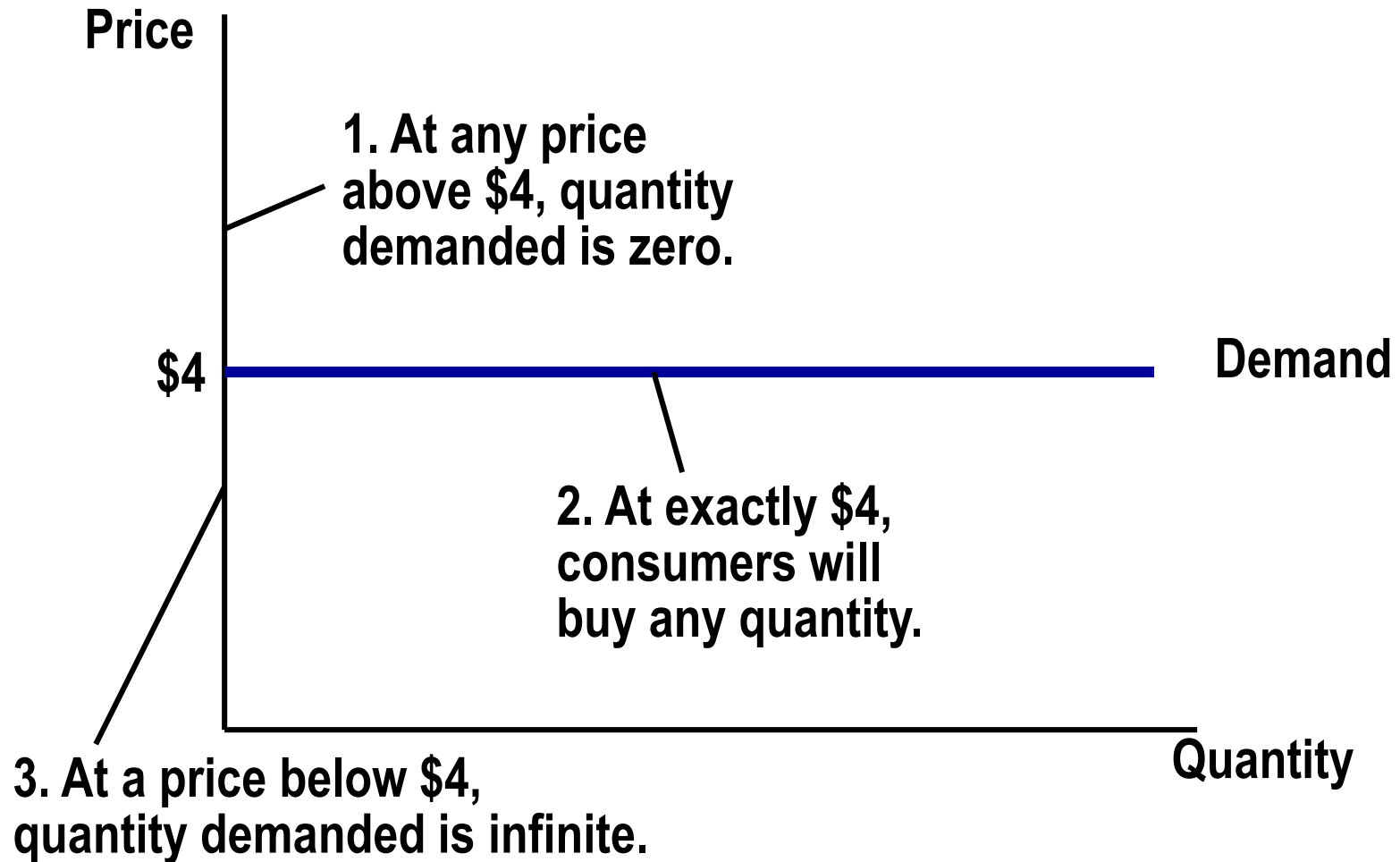
Determinants of
Price Elasticity of Demand

◆ *Necessities versus Luxuries*

◆ *Availability of Close Substitutes*

◆ *Definition of the Market*

◆ *Time Horizon*

Determinants of Price Elasticity of Demand

- Demand tends to be more inelastic
  - If the good is a necessity.
  - If the time period is shorter.
  - The smaller the number of close substitutes.
  - The more broadly defined the market.

Determinants of
Price Elasticity of Demand

Demand tends to be more elastic :

◆ if the good is a luxury.

◆ the longer the time period.

◆ the larger the number of close substitutes.

◆ the more narrowly defined the market.

Elasticity and Total Revenue

◆ Total revenue is the amount paid by buyers and received by sellers of a good.

◆ Computed as the price of the good times the quantity sold.

$$TR = P \times Q$$

Elasticity and Total Revenue

Price

$4

P

P **x** *Q* **= $400**

(total revenue)

Demand

0

100

Q

Quantity
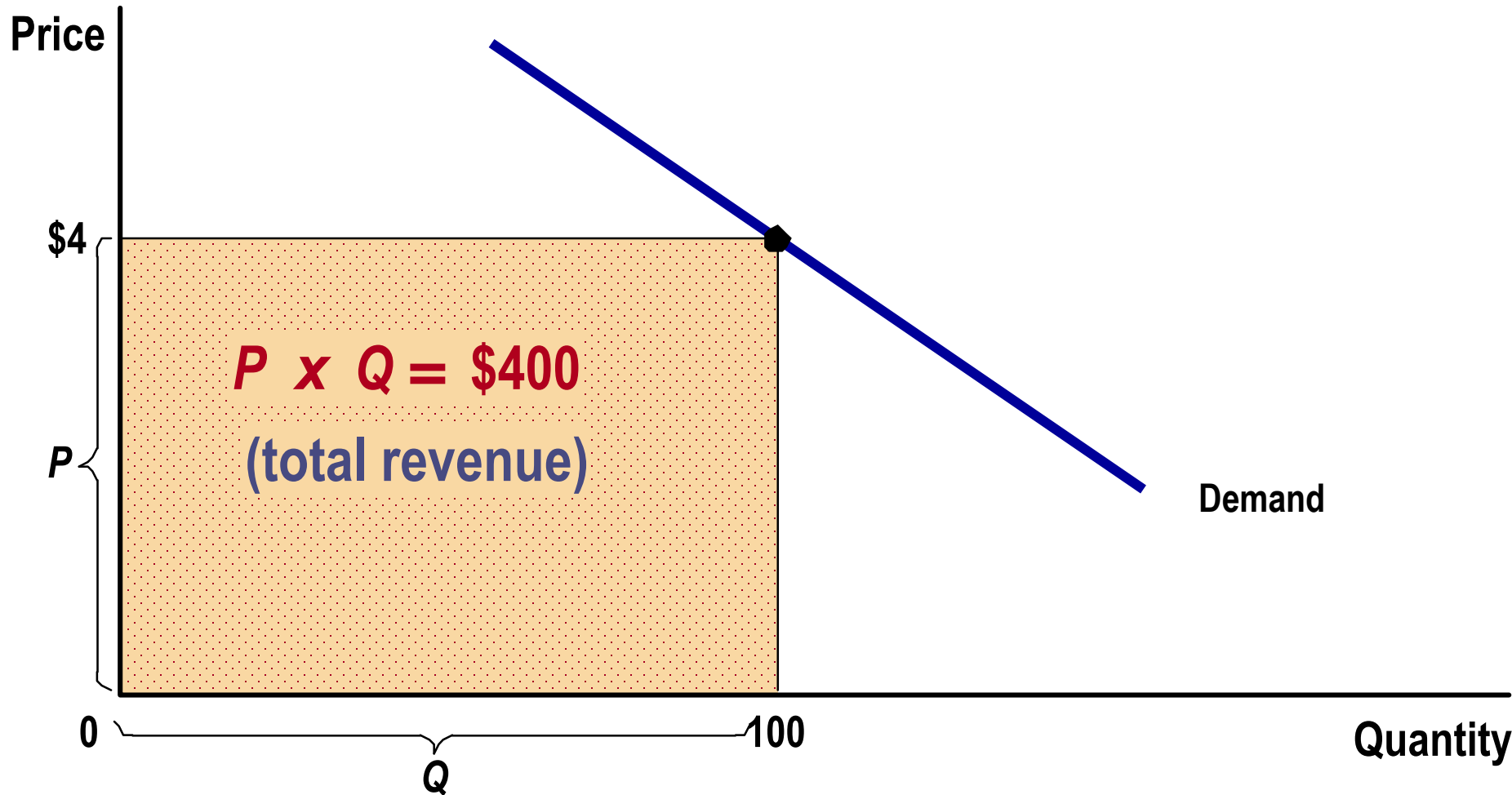
The Total Revenue Test for Elasticity

	Increase in Total Revenue	**Decrease in Total Revenue**
Increase in Price	**INELASTIC DEMAND**	**ELASTIC DEMAND**
Decrease in Price	**ELASTIC DEMAND**	**INELASTIC DEMAND**

Income Elasticity of Demand

◆ Income elasticity of demand measures how much the quantity demanded of a good responds to a change in consumers' income.

◆ It is computed as the percentage change in the quantity demanded divided by the percentage change in income.

Computing Income Elasticity

Income Elasticity of Demand **=** $\dfrac{\textbf{Percentage Change in Quantity Demanded}}{\textbf{Percentage Change in Income}}$

Income Elasticity
- Types of Goods -

◆ *Normal Goods*

  ◆ Income Elasticity is positive.

◆ *Inferior Goods*

  ◆ Income Elasticity is negative.

◆ Higher income *raises* the quantity demanded for normal goods but *lowers* the quantity demanded for inferior goods*.*

Cross Price Elasticity of Demand

- Elasticity measure that looks at the impact a change in the price of one good has on the demand of another good.

- % change in demand Q1/% change in price of Q2.

- Positive-Substitutes

- Negative-Complements.

Cost Function & Supply Curve

The Supply Curve: The Production Decision

To take production decisions, we need to understand

1. Production technology
2. Choice of inputs
3. Cost constraints

1 and 2 comprise the **production function,** the relationship between inputs and the maximum amount that can be produced within a given period of time with a given level of technology

$$q = F(K, L)$$

Where

q =   quantity produced (flow)

K =   kapital (flow) – factors of production

L =   labour (flow) – factors of production, and all other variable inputs like raw material

F is defined by technology

Production with one variable input (short run)

- **average product =** Output per unit of a particular input, = q/L

- **marginal product =** Additional output produced as an input is increased by one unit. $= \Delta q/\Delta L$

To the left of point E in **(b)**, $MP > AP$, AP is increasing; to the right of E, $MP < AP$, AP is decreasing.

E represents the point at which $AP=MP$, when AP is maximum.

At D, when total output is maximized, the slope of total product curve is 0, as is the MP.

- The total product curve in **(a)** shows the output produced for different amounts of labor input.
- The average and marginal products in **(b)** can be obtained from the total product curve.
- At point A in **(a)**, the marginal product is 20 (= slope of total product curve)
- At point B in **(a)** the average product of labor is 20 (60/3), which is the slope of the line from the origin to B.
- The average product of labor at point C in **(a)** is given by the slope of the line OC.

82
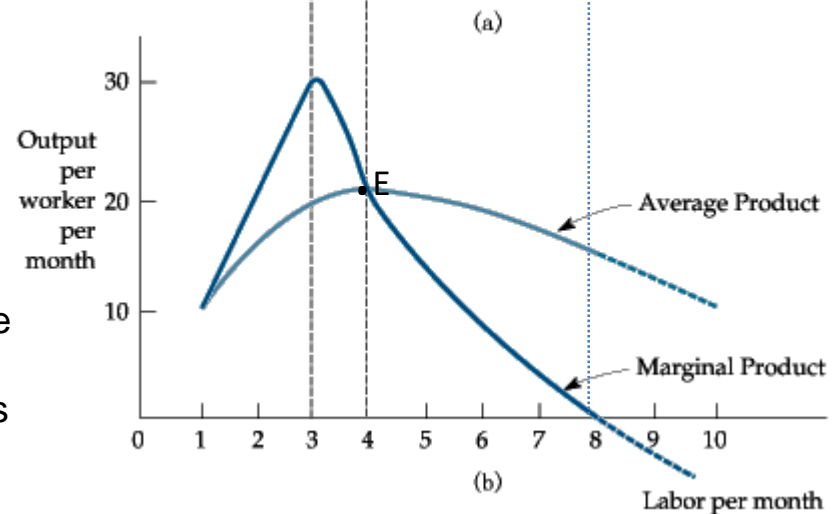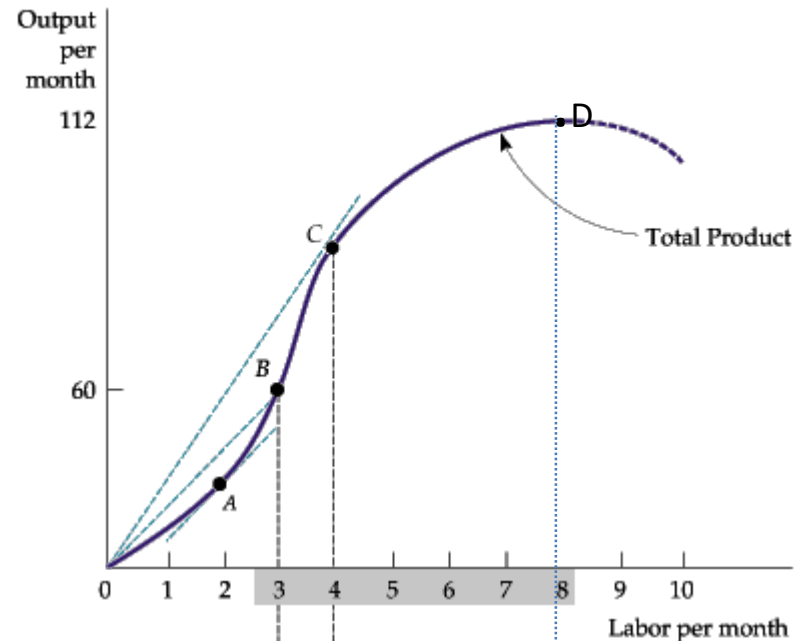
Law of Diminishing Marginal Returns

- Principle that as the use of an input increases with other inputs fixed, the resulting additions to output will eventually decrease

- As we move from point **A** on curve **O_1** to **B** on curve **O_2** to **C** on curve **O_3** over time, labour productivity (output per unit of labour increases

- **$O_1 \rightarrow O_2 \rightarrow O_3$:** **technological improvement**

Output per month

112

60

B

A

0   1   2   3   4   5   6   7   8   9   10

Labor per month

Total Product

.D

(a)

30

Output per worker per month 20

10

.E

Average Product

I

II

III

Marginal Product

0   1   2   3   4   5   6   7   8   9   10

Labor per month

(b)

84
84
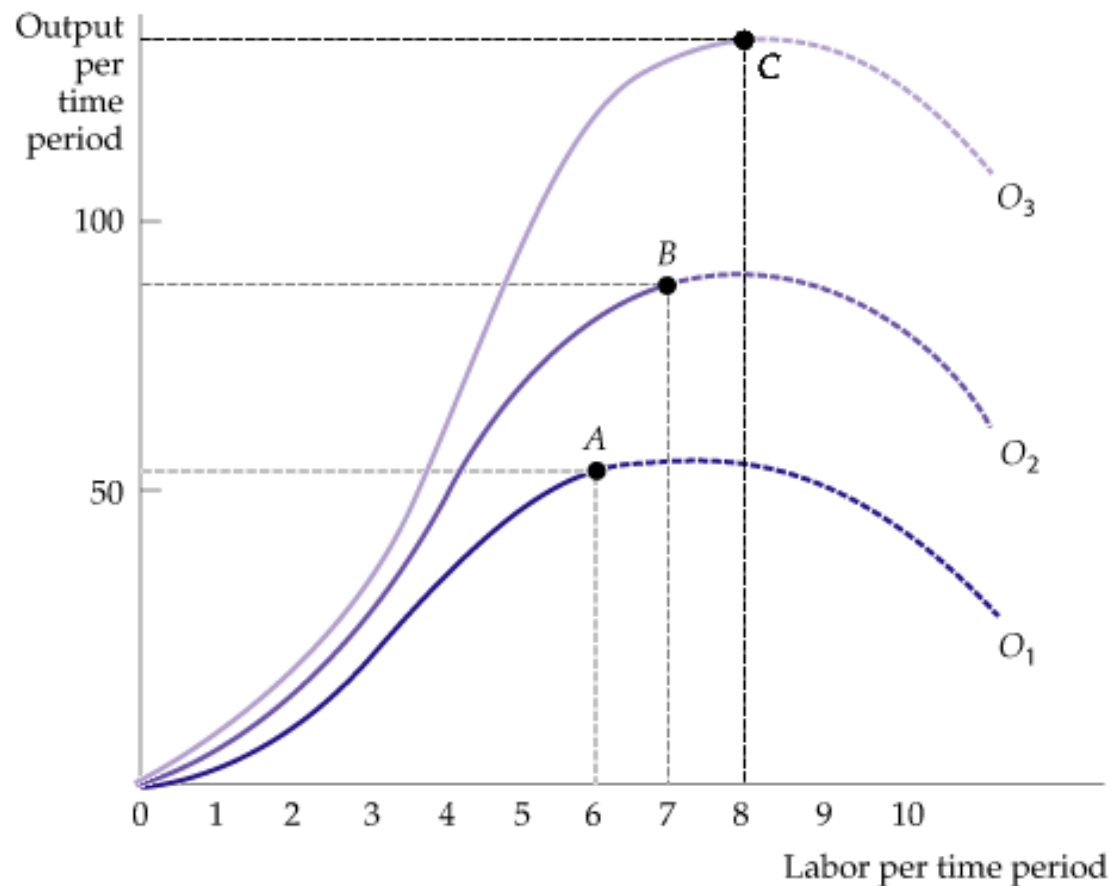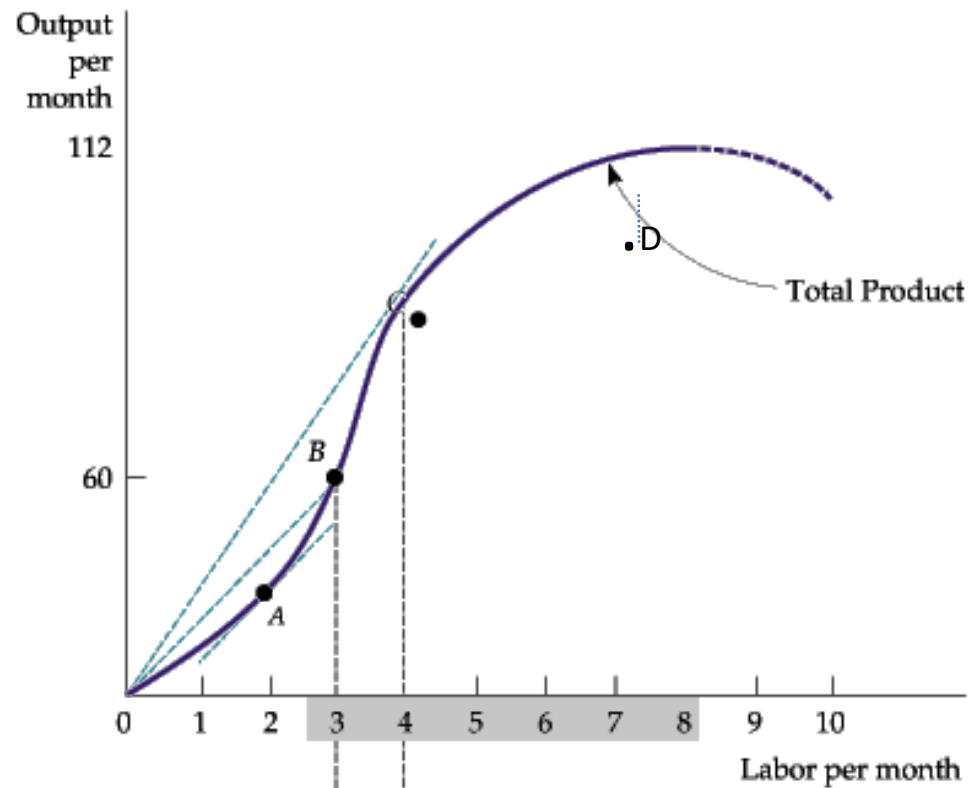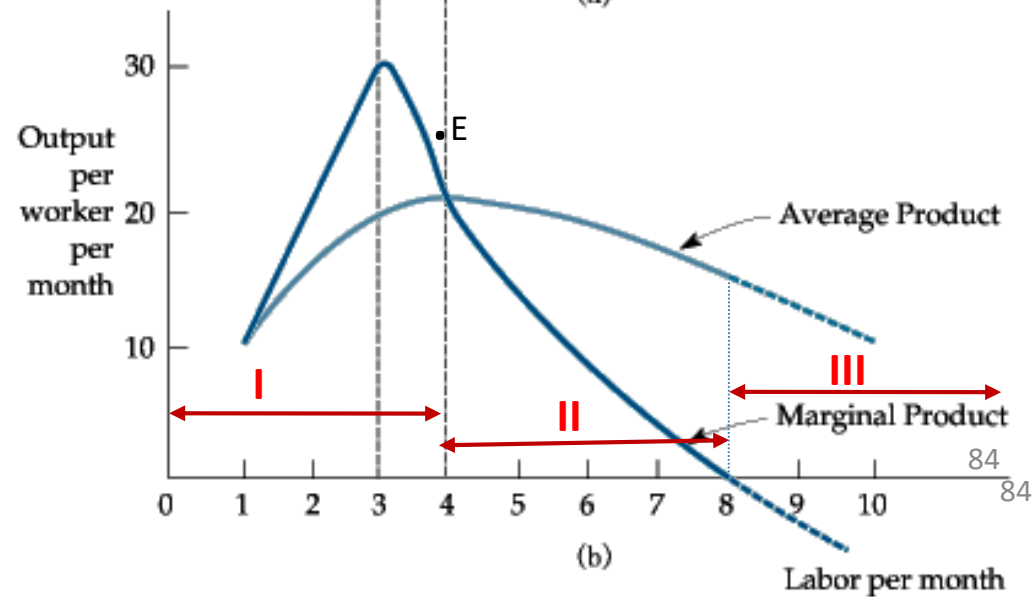
Production with two variable inputs

Isoquant: Curve showing all possible combinations of inputs that yield the same output
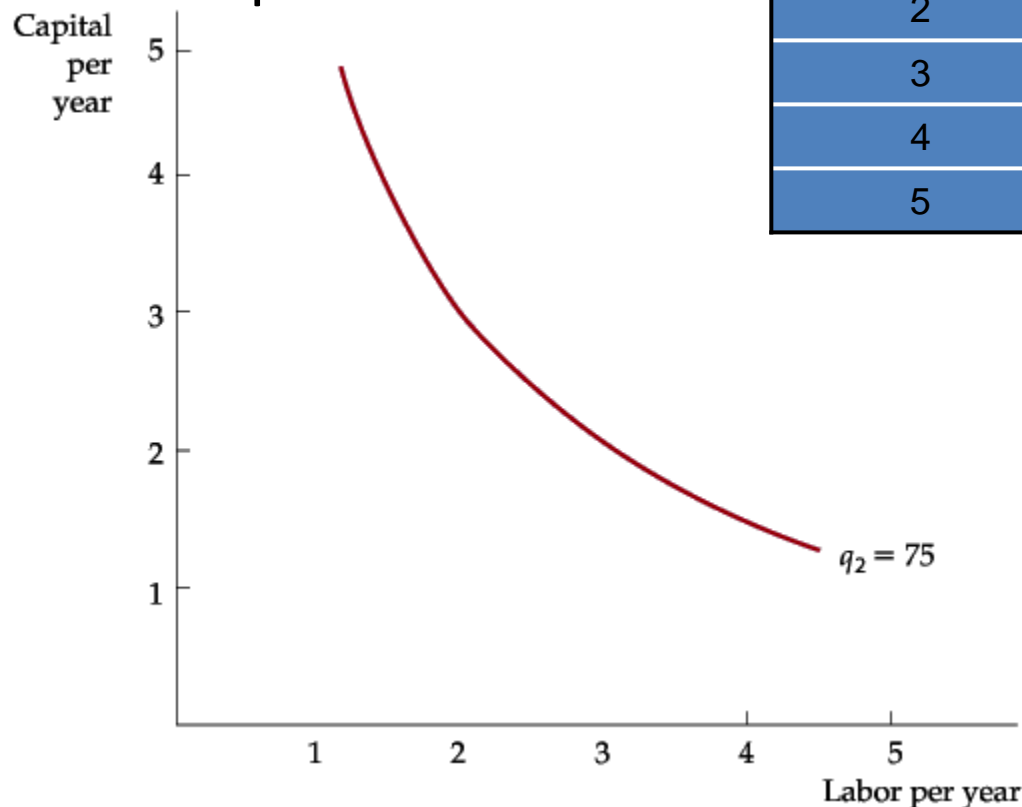
TABLE 6.4 Production with Two Variable Inputs					
	LABOR INPUT				
Capital Input	**1**	**2**	**3**	**4**	**5**
1	20	40	55	65	75
2	40	60	75	85	90
3	55	75	90	100	105
4	65	85	100	110	115
5	75	90	105	115	120

$q_2 = 75$

Iso-quant map: Graph combining a number of isoquants, used to describe a production function

Properties of Isoquants

1. **Downward sloping**: - If I use more **K** (**L**) I will need less **L** (**K**) to produce the same **Q**, using the same (optimal) technology

2. **Do not intersect each other**: Each isoquant is a representation of the production function for a given level of output.

3. **Convex to the Origin**: because the marginal rate of technical substitution (**-ΔK/ΔL)** is negative and decreasing. Each factor exhibits diminishing marginal product

Holding K = 3 , note that each additional unit of L generates less and less addl q.
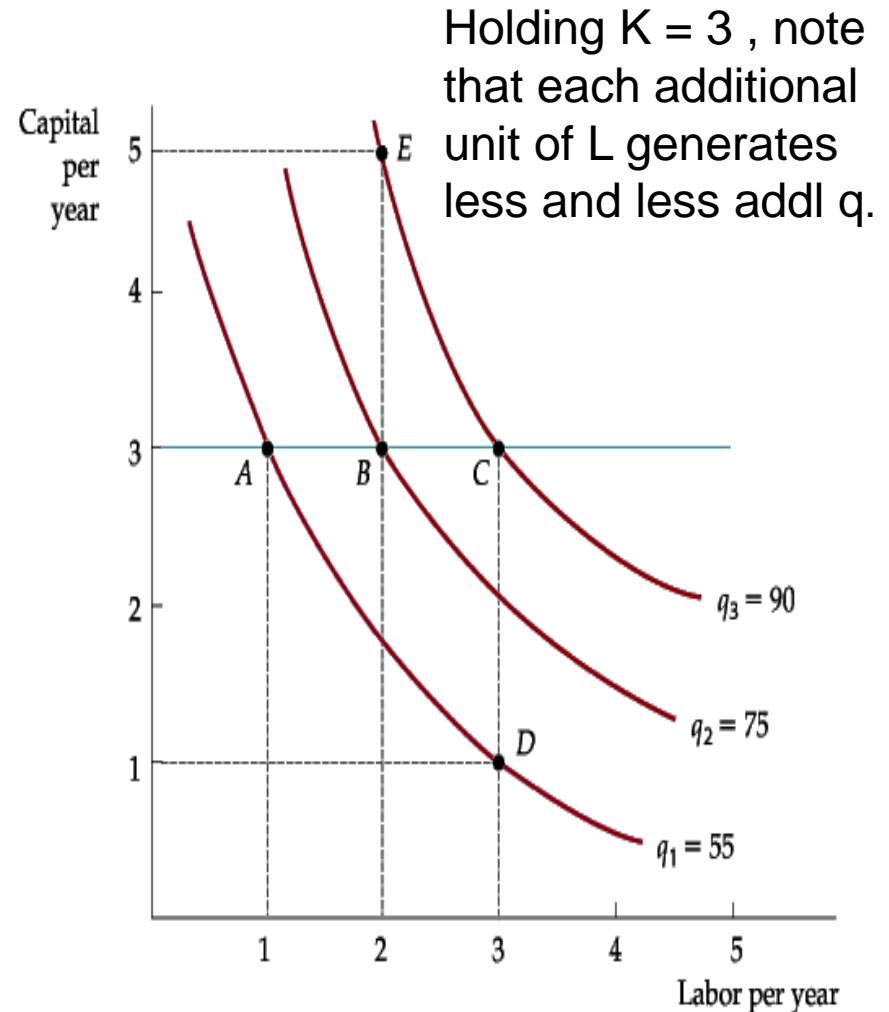
Fixed Costs and Variable Costs

Total cost (TC or **C) =** Total economic cost of production, consisting of fixed and variable costs. = FC+VC

Fixed cost (FC)

- Cost that does not vary with the level of output **and that can be eliminated only by shutting down**.

- does not change as the firm's level of output changes

- **Shutting down:** By reducing the output to zero, the company could eliminate cost of raw materials and labor. The only way to eliminate fixed costs would be to close the doors, turn off the electricity, and perhaps sell off or scrap machinery.

Variable cost (VC)

- Cost that varies as output varies.

- Over a very short time horizon—say, a few months—most costs are fixed - the firm is usually obligated to pay for contracted shipments of materials.

- Over a very long time horizon—say, ten years—nearly all costs are variable. Workers can be laid off, machinery can be sold off or scrapped.

Costs

Cost ($)

1,500
1,000
500

33

Number of garden benches produced per week
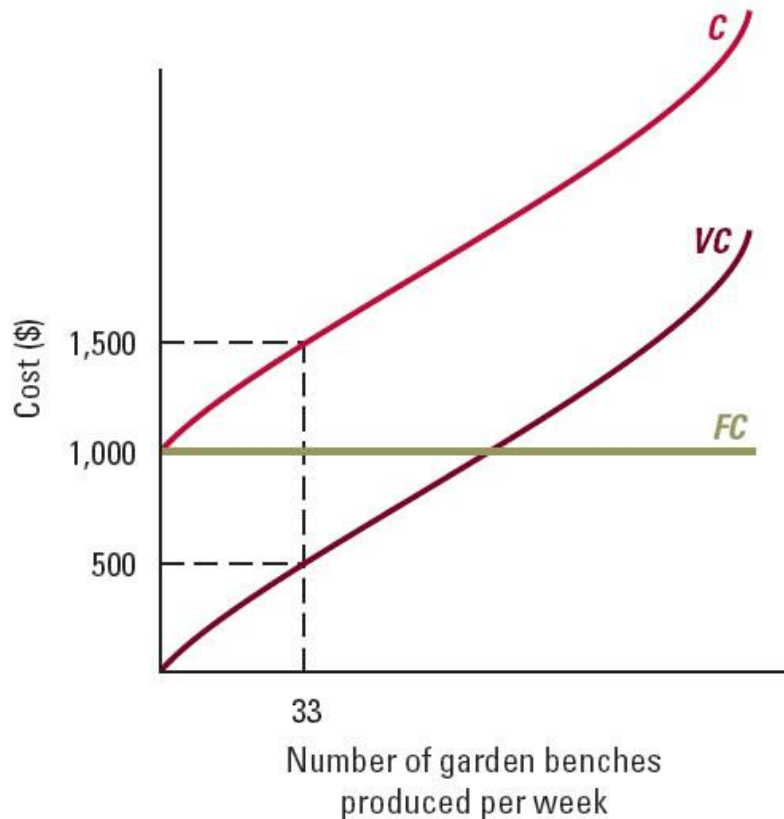
- **marginal cost (MC)**
  Increase in cost resulting from the production of one extra unit of output

  $$MC = \Delta VC/\Delta q = \Delta TC/\Delta q$$

- **average total cost (ATC)**
  Firm's total cost divided by its level of output = AFC+AVC

- **average fixed cost (AFC)**
  Fixed cost divided by the level of output. = FC/Q

- **average variable cost (AVC)**
  Variable cost divided by the level of output. = VC/Q

- As output increases:
  - Marginal cost first falls and then rises
  - Average cost follows the same pattern

A Firm's Short RunCosts

Rate of Output (Units per Year)	Fixed Cost (Rs per Year)	Variable Cost (Rs per Year)	Total Cost (Rs per Year)	Marginal Cost (Rs per Unit)	Average Fixed Cost (Rs per Unit)	Average Variable Cost (Rs per Unit)	Average Total Cost (Rs per Unit)
	(FC) (1)	(VC) (2)	(TC) (3)	(MC) (4)	(AFC) (5)	(AVC) (6)	(ATC) (7)
0	50	0	50	--	--	--	--
1	50	50	100	50	50	50	100
2	50	78	128	28	25	39	64
3	50	98	148	20	16.7	32.7	49.3
4	50	112	162	14	12.5	28	40.5
5	50	130	180	18	10	26	36
6	50	150	200	20	8.3	25	33.3
7	50	175	225	25	7.1	25	32.1
8	50	204	254	29	6.3	25.5	31.8
9	50	242	292	38	5.6	26.9	32.4
10	50	300	350	58	5	30	35
11	50	385	435	85	4.5	35	39.5

Costs in the Short Run

Point A (7, 175)

AVC = 175/7 = 25

MC= dVC/dQ = 25

When AVC= MC, AVC is minimised (recall that when $AP_L=MP_L$, AP_L is mazimised)

Efficient scale of production exceeds output level where AVC is lowest, as ATC=AFC+AVC still falling
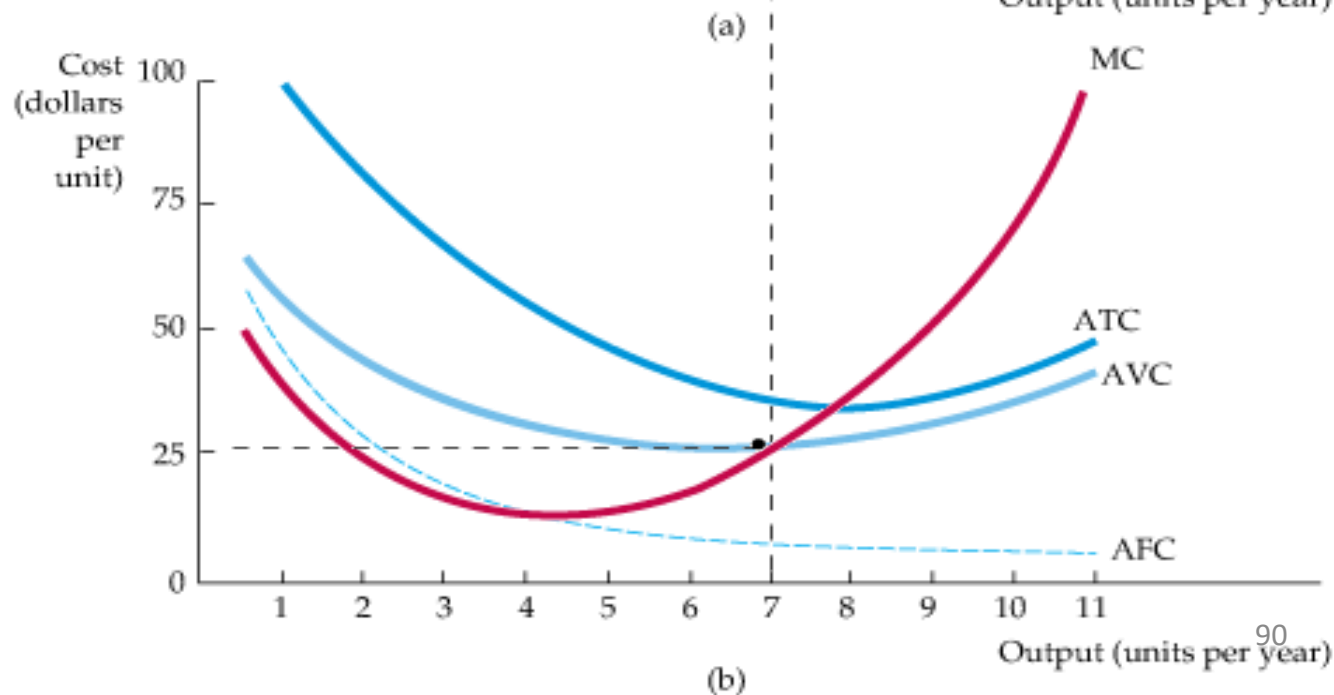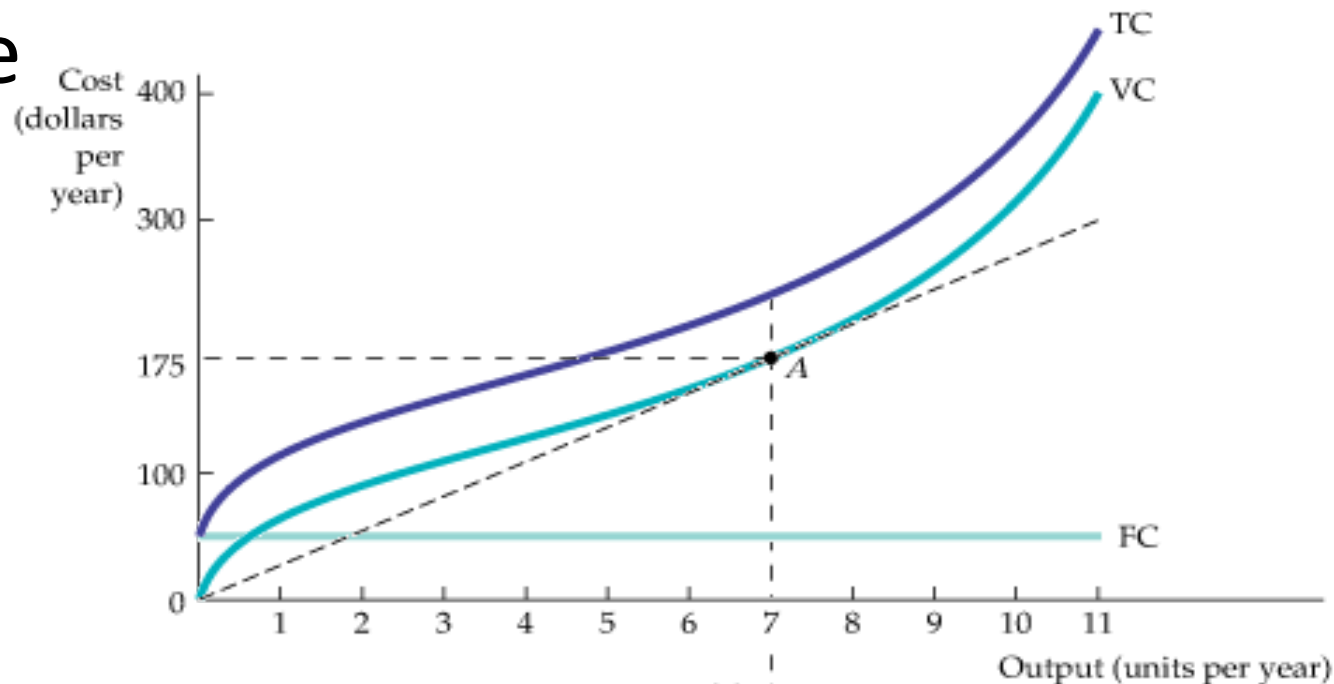
AC and MC Curves
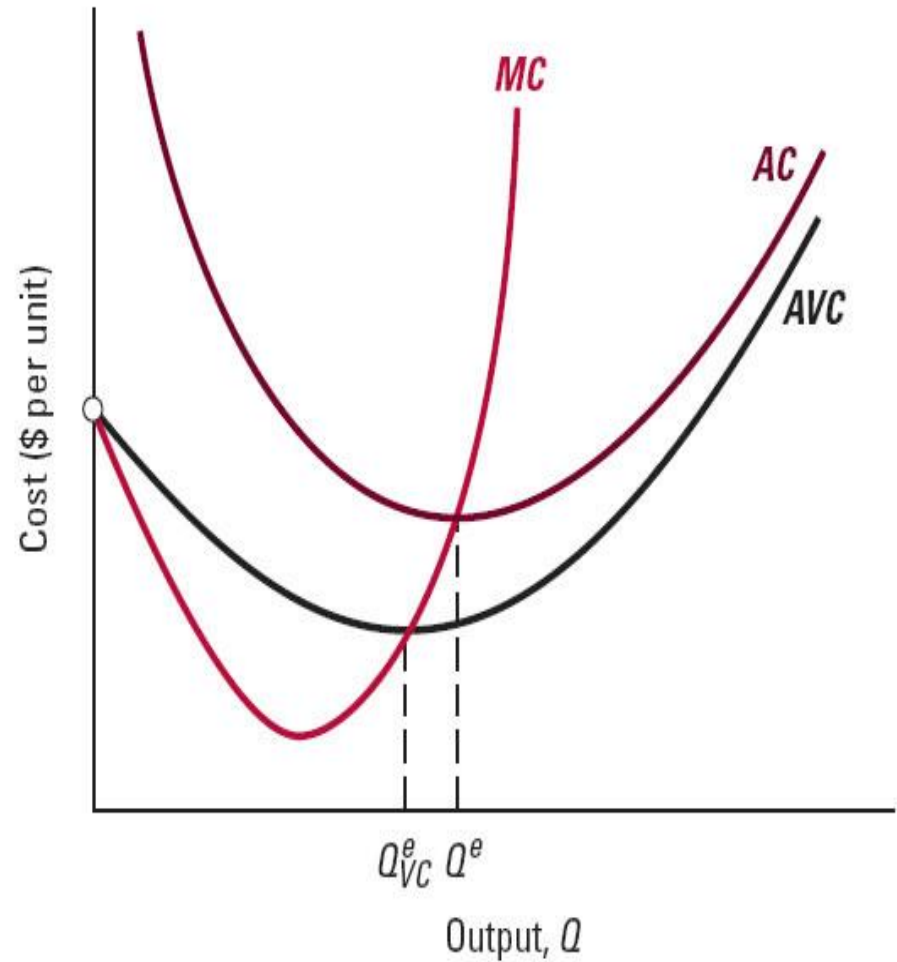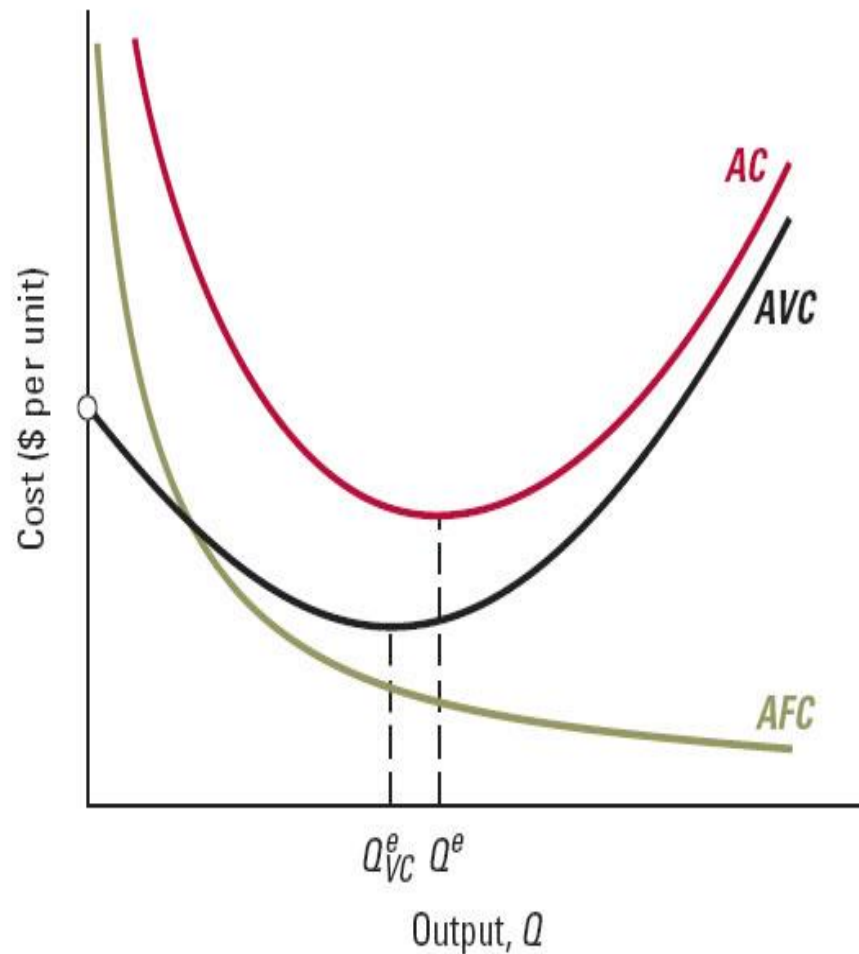
Costs in the Long Run

- No FC, all inputs variable, work with 2 variable inputs (L,K)
- w= cost of labour, L
- r= 'user cost' of capital, K = annual cost of owning and using a capital asset = depreciation rate + interest rate(financial return forgone)
- r='rental'rate for capital (cost of renting a unit of capital)

ISOCOST line

Total Cost, C = wL+rK, also called an

Or, K=C/r-wL/r

slope = –(w/r), the negative of the ratio of input prices

Problem: How to select inputs to produce a given output at minimum cost.

Producing a given Q at minimum Cost

Capital per year

Labor per year
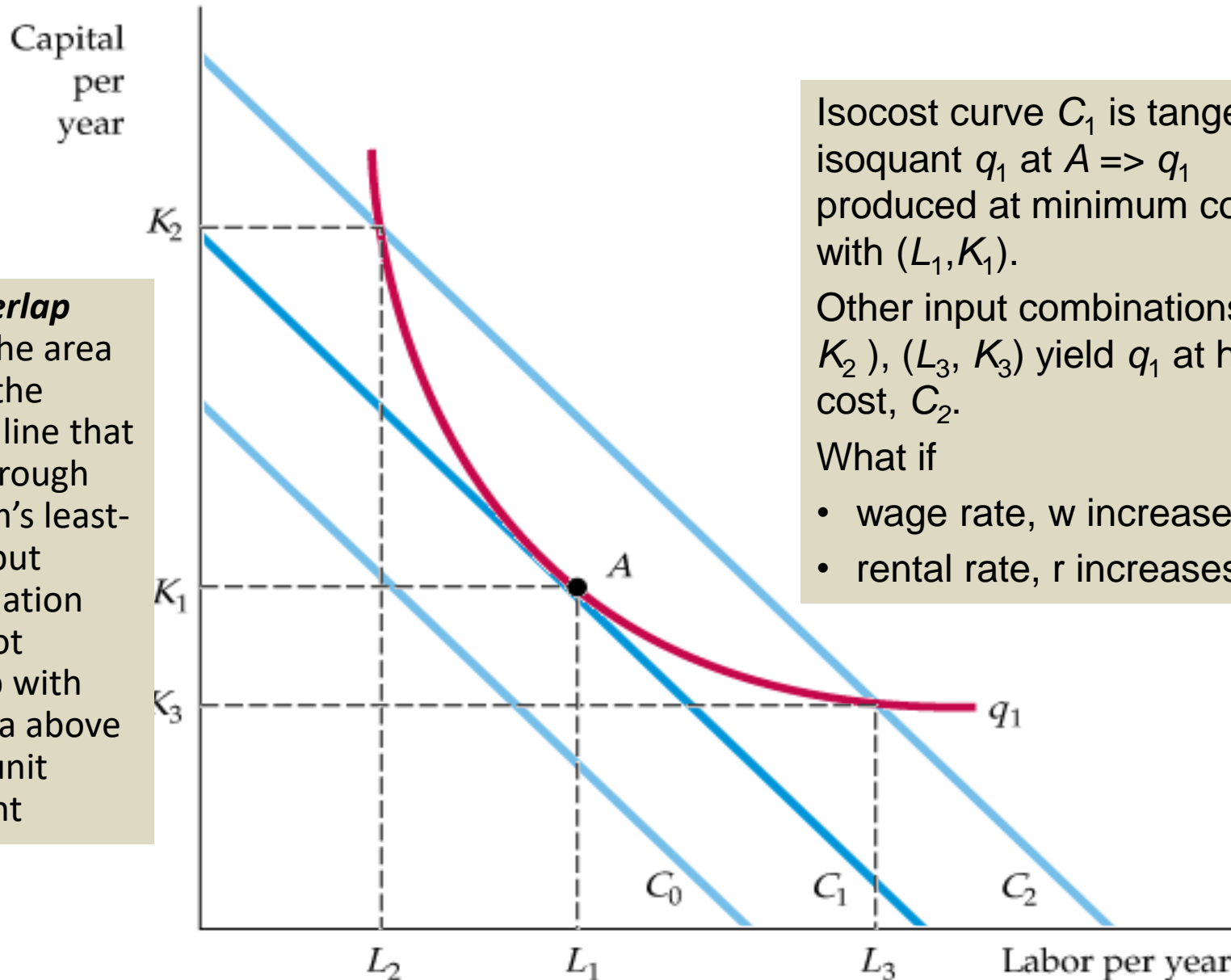
No-Overlap Rule: The area below the isocost line that runs through the firm's least-cost input combination does not overlap with the area above the Q-unit isoquant

Isocost curve C_1 is tangent to isoquant q_1 at A => q_1 produced at minimum cost with (L_1, K_1).

Other input combinations—(L_2, K_2), (L_3, K_3) yield q_1 at higher cost, C_2.

What if

- wage rate, w increases?
- rental rate, r increases?

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Onto the Firm's Cost Function

- Need to know the least cost input combination for every output level

- So, first obtain the firm's output **expansion path** – the curve passing through points of tangency between a firm's isocost lines and its isoquants.

- Then graph the output-cost combination – the firm's total cost curve
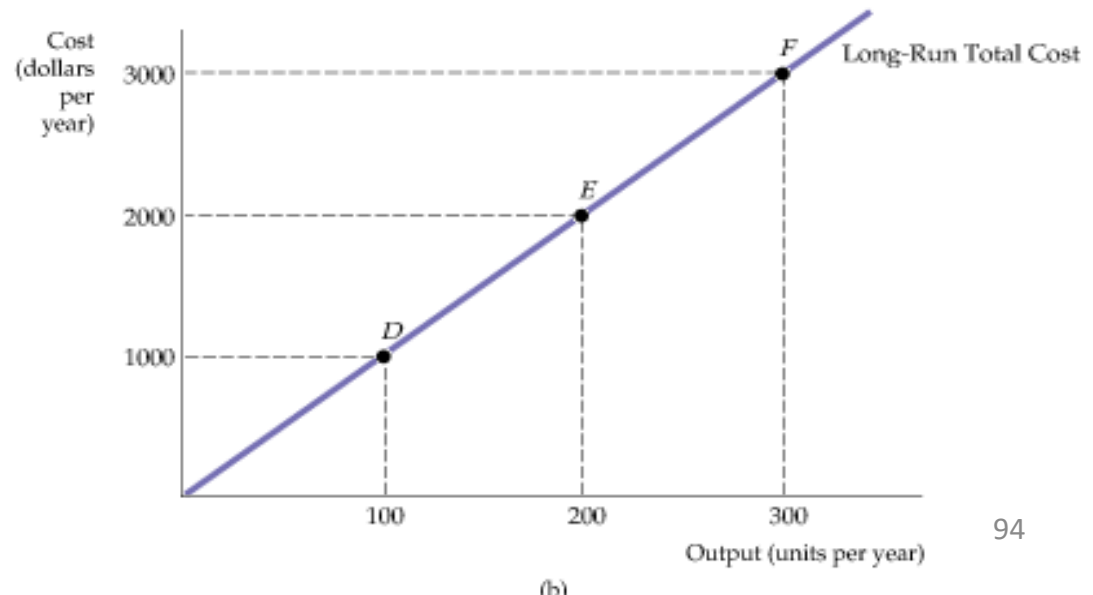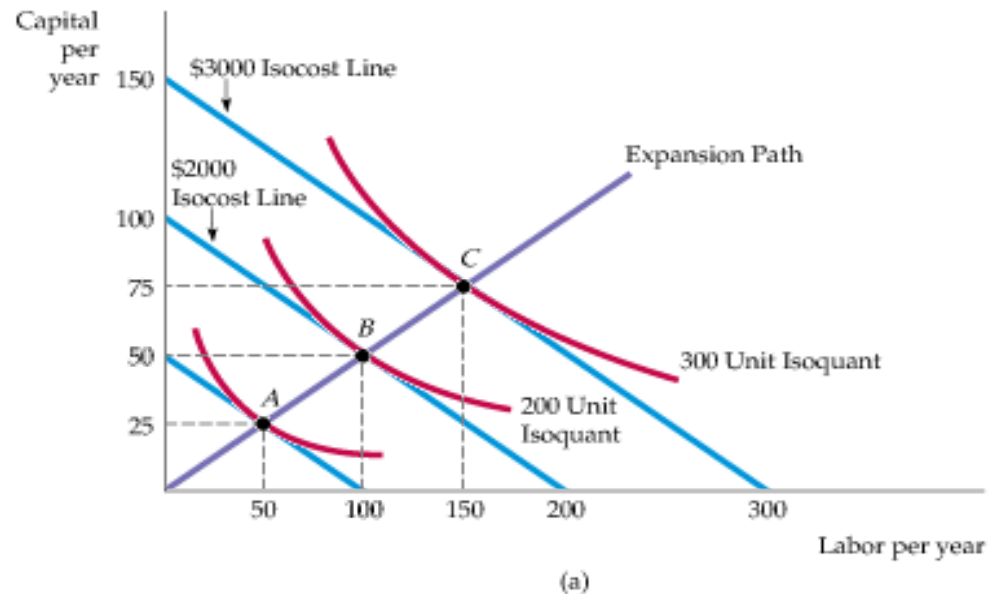
The Inflexibility of Short-Run Production
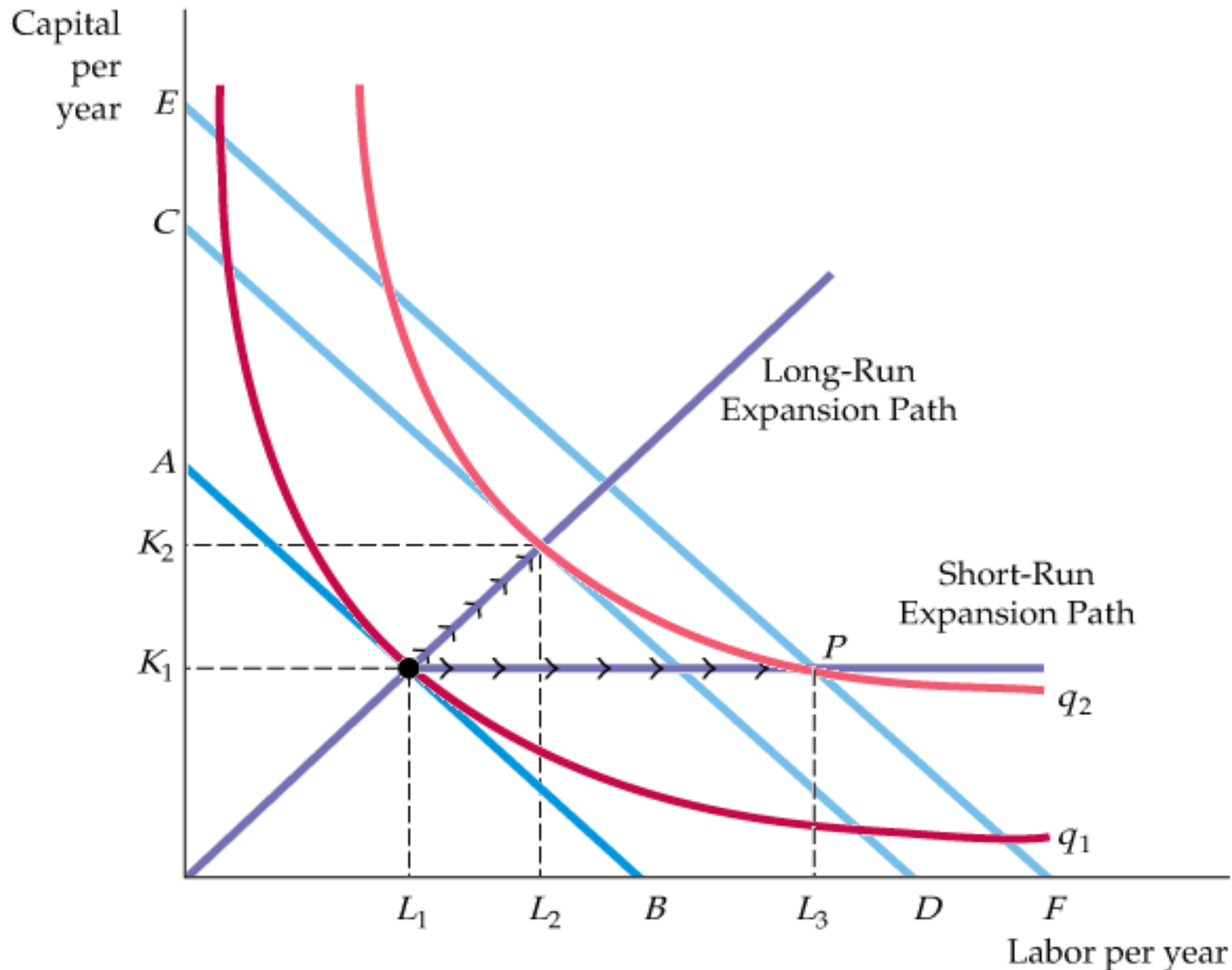
The Relationship Between Short-Run and Long-Run Cost
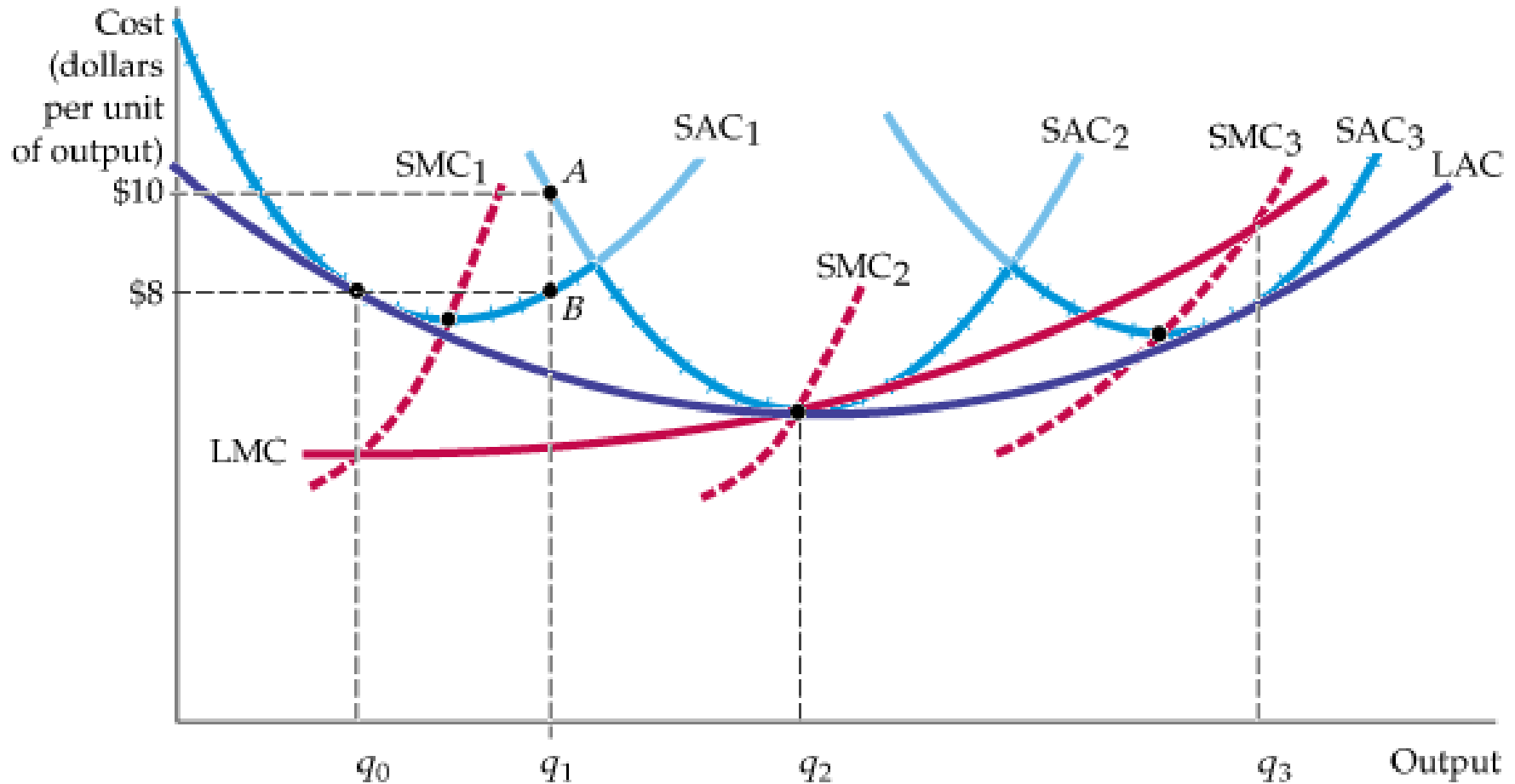
With economies and diseconomies of scale, the minimum points of the short-run average cost curves do not lie on the long-run average cost curve.

Profit Maximisation under Competitive Market Conditions

Perfectly Competitive Market

- Characteristics
  - MANY independent sellers
    - Market share of each firm similar and insignificant
  - Homogenous products
  - Free (or easy) entry and exit of firms
  - Free and full information

- Result
  - NO individual firm has any control over market price
  - In the long run only normal profits are earned
  - NO direct competition (personal rivalry) among firms

Perfectly Competitive Market

- "IDEAL", theoretical market condition

- Approximated by
  - foodgrain market
  - vegetable market
  - stock market

- Good, welfare maximising analytical framework

- BUT NOT BEST for firm

- Managers constantly seeking ways to obtain market power
  - Differentiating product
  - Colluding
  - Preventing entry
  - Restricting information flow, etc.

Equilibrium of the Firm

- Objective: Maximise Profits (π)

$$\pi(q) = R(q) - C(q)$$

What happens to π if $q < q^*$
if $q > q^*$?

Using Algebra:

To maximise $\pi(q)$,

$d\,\pi/dq = 0$

$d^2\,\pi/dq^2 < 0$

$\rightarrow$ MR(q) = MC(q)

Cost,
Revenue,
Profit,

Rs

C(q)

R(q)

q_o

q^*

$\pi(q)$

Output, units
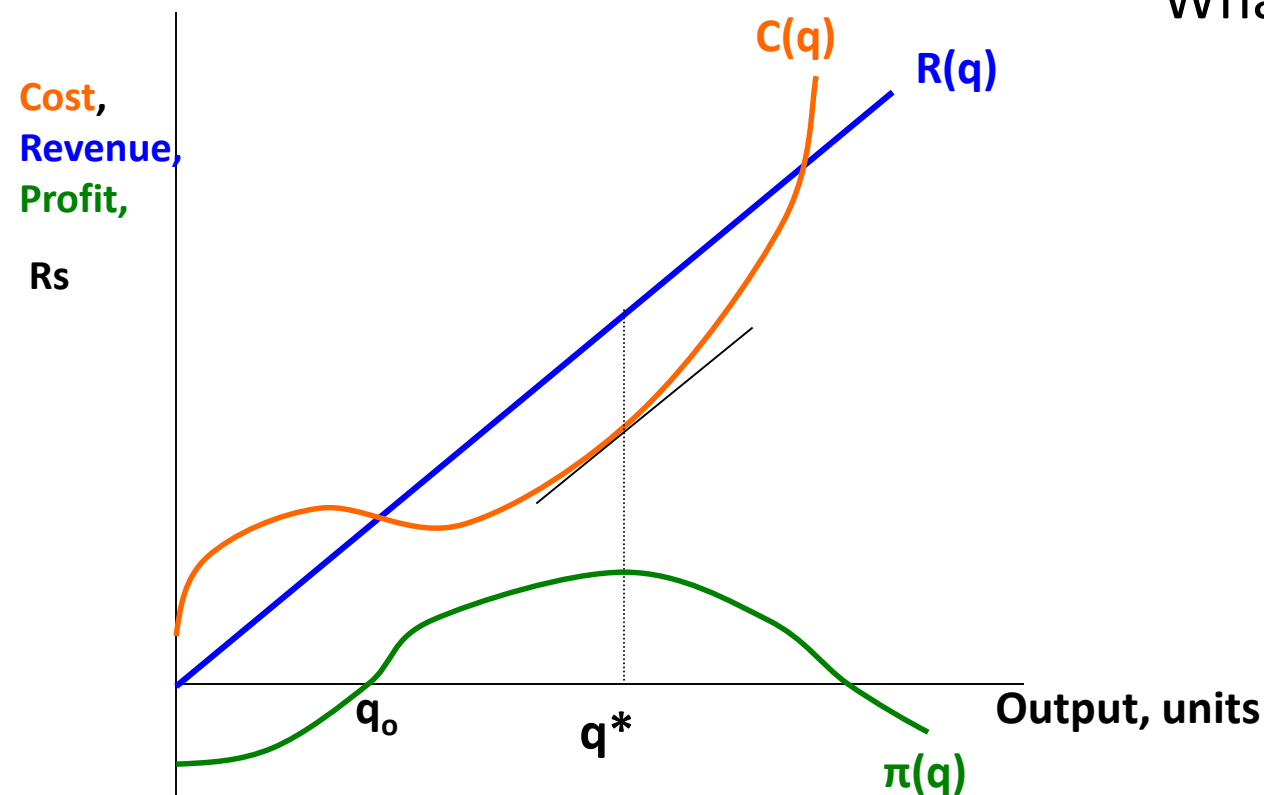
Demand Curve for the Firm

Firm is Price Taker

Price, P

Price, P

P*

Output, q

Q*

Output, Q

Firm

Industry

Short Run Firm Equilibrium

Price = AR=MR=MC

Price > SATC

Π > or = 0, or loss, discussed next

Price,P

MC

P*

AR=MR=P

ATC

AVC

q_1 q^* q_2

Output, q
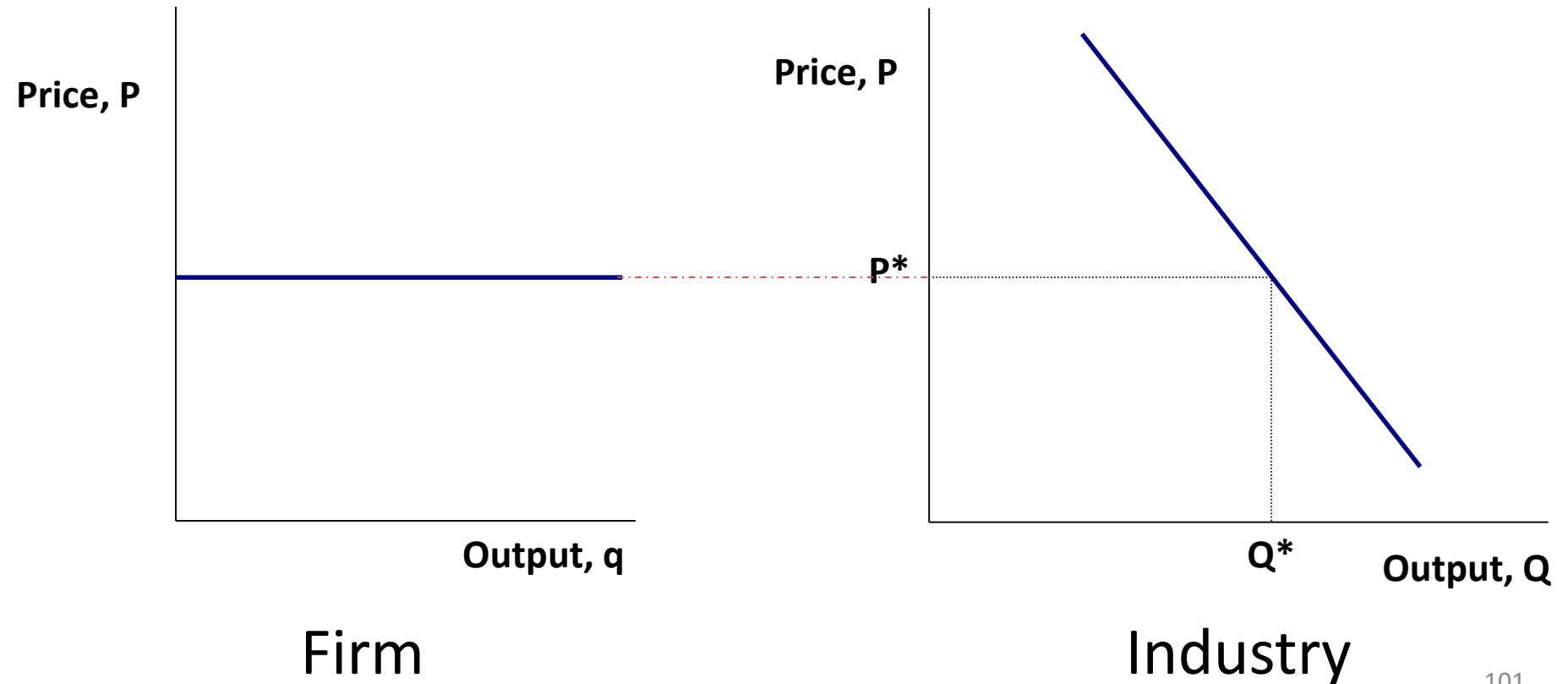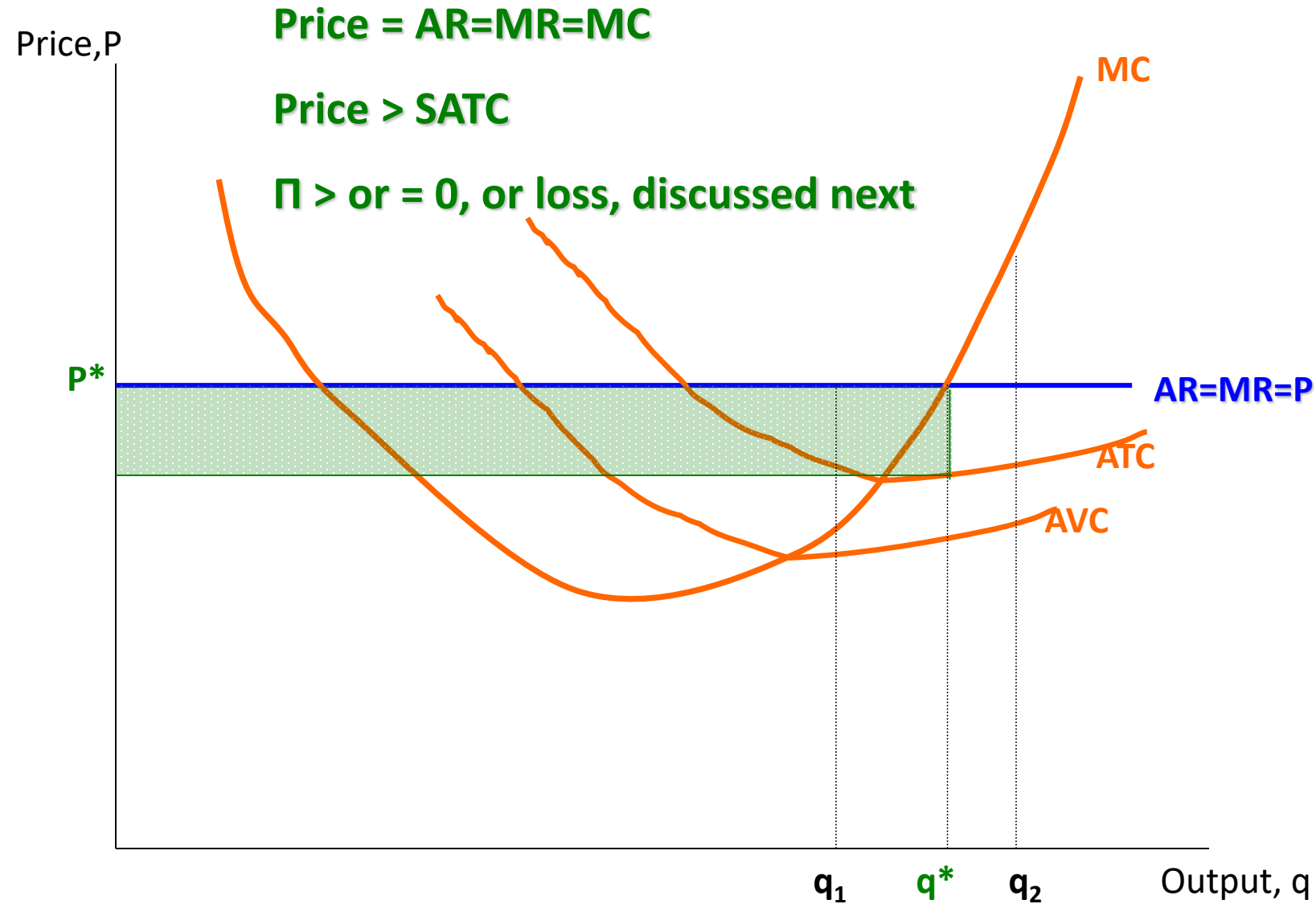
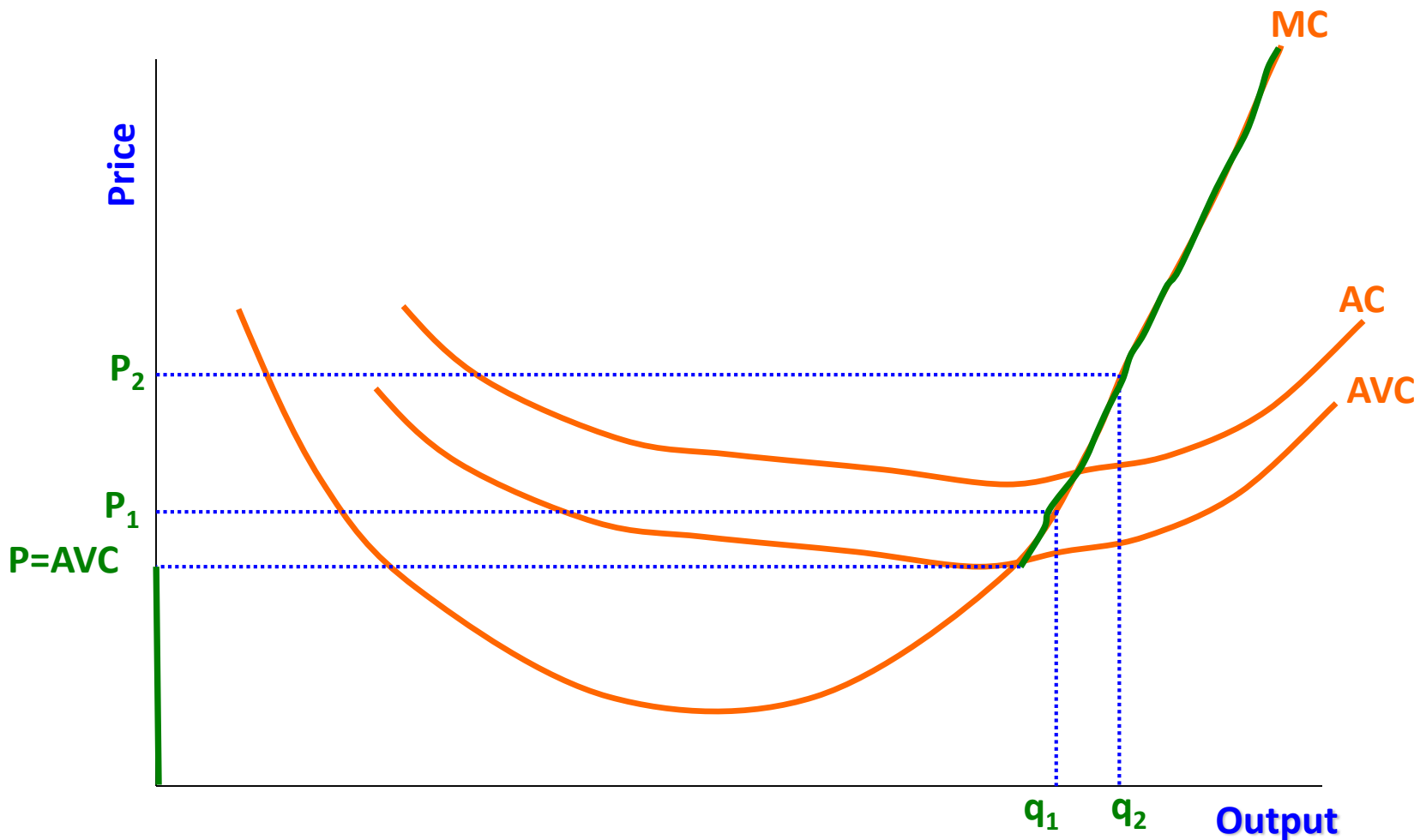# Short Run Firm Equilibrium
Loss and Reservation Price

Industry
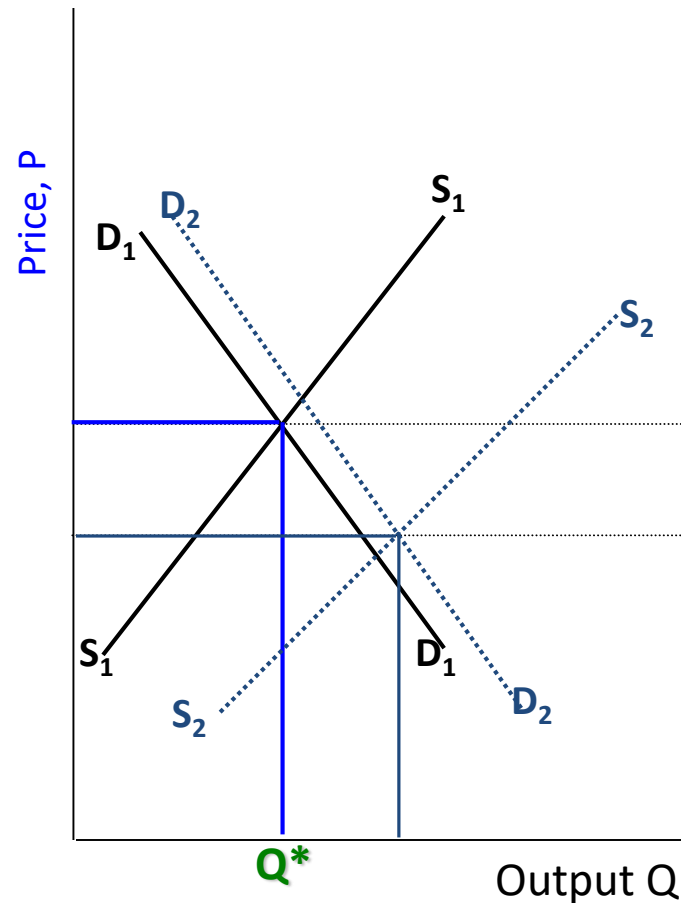
Firm
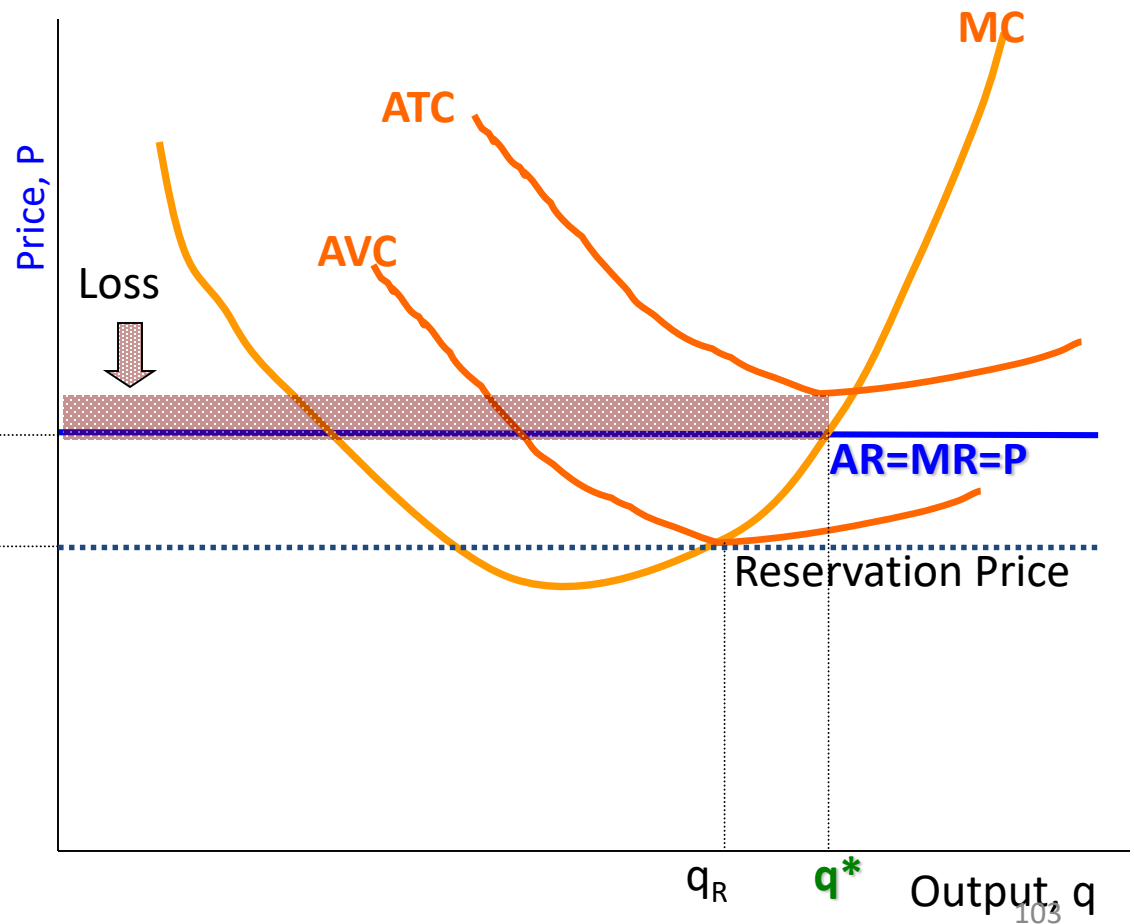
Short Run Firm Supply Curve

Short Run Industry Supply Curve (only 3 firms)
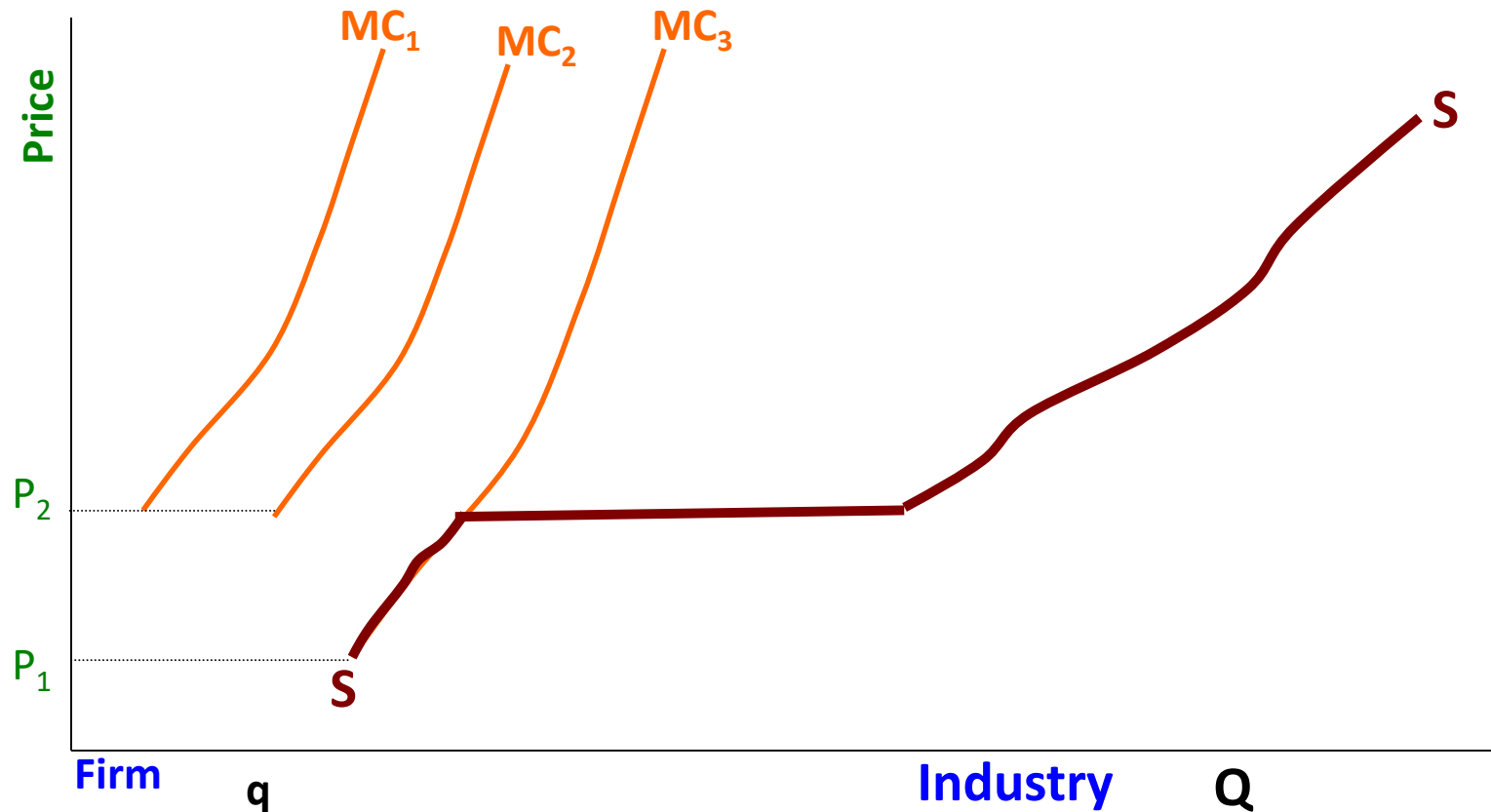
The Long Run

Industry

Firm

Price, P

D_1

S_0

S_1

P_{SR}

S_0

P_{LR}

S_1

D_1

Q^*

Output Q
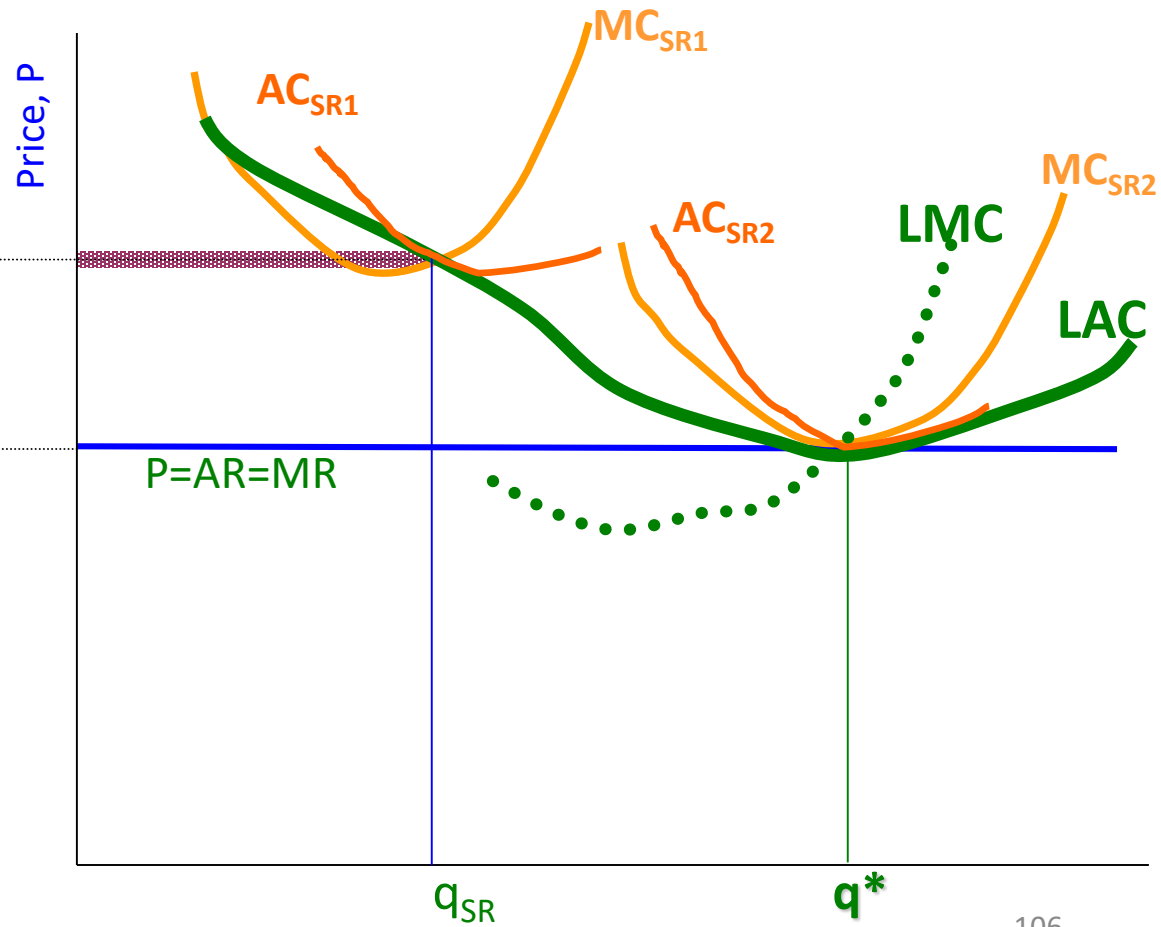
MC_{SR1}

AC_{SR1}

AC_{SR2}

MC_{SR2}

LMC

LAC

P=AR=MR

q_{SR}

q^*
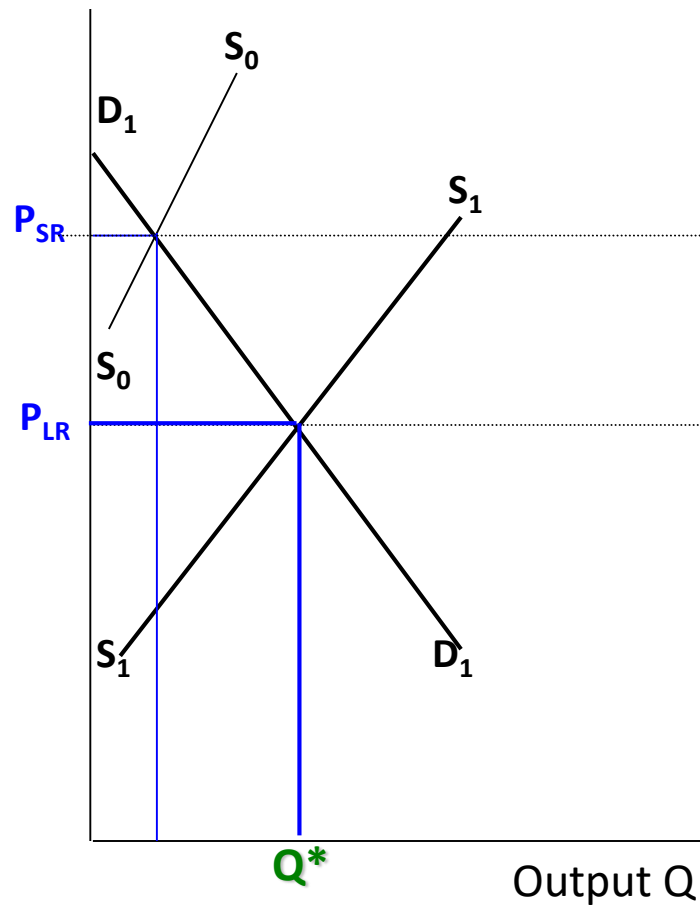
The Long Run

- Firms have time to enter or exit

- Existing firms can change scale of production, i.e. we move to the long run cost curves

- All supernormal profits/losses wiped out

Monopoly

- Sole producer of a commodity with no close substitutes (low c.p.elasticity)
- "price-maker"
- Substantial barriers to entry
- Constrained by downward sloping demand curve → set P, choose Q, or set Q, choose P
- Examples….

- Sources of Market Power (= ability of a firm to raise price without losing ALL its sales)
  - Control over critical inputs
  - Economies of scale
  - Patents
  - Licenses
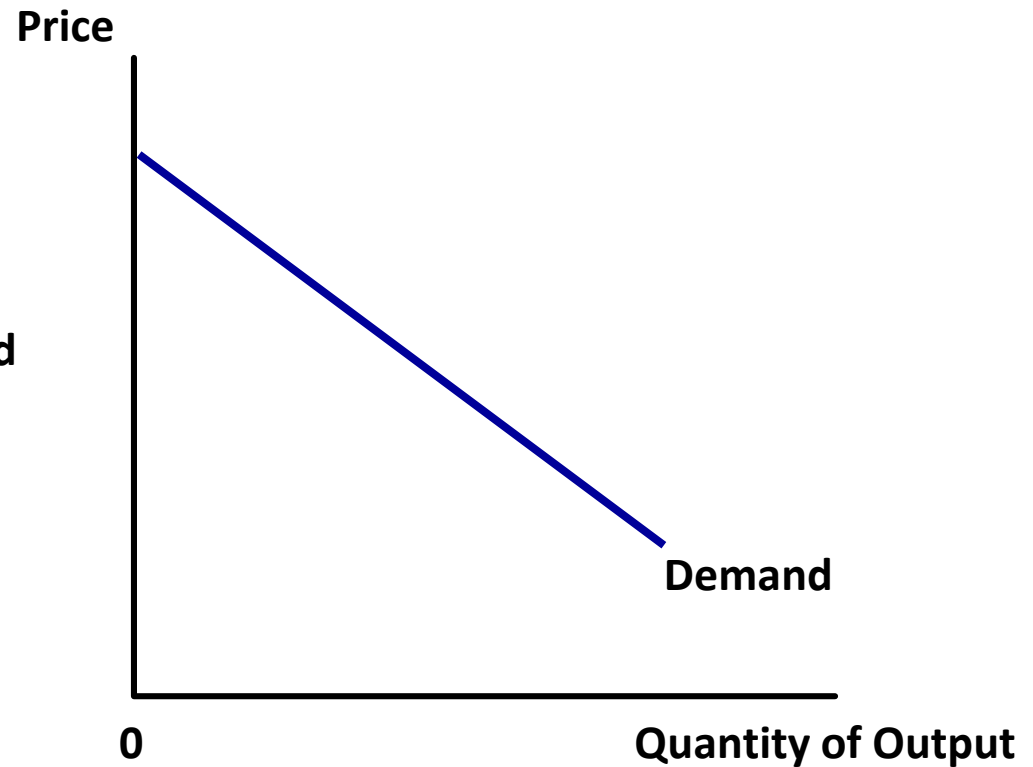 - Gestation lags
  - Consumer loyalty

Demand Curves for Competitive and Monopoly Firms...

(a) A Competitive Firm's Demand Curve

Price

Demand

0

Quantity of Output
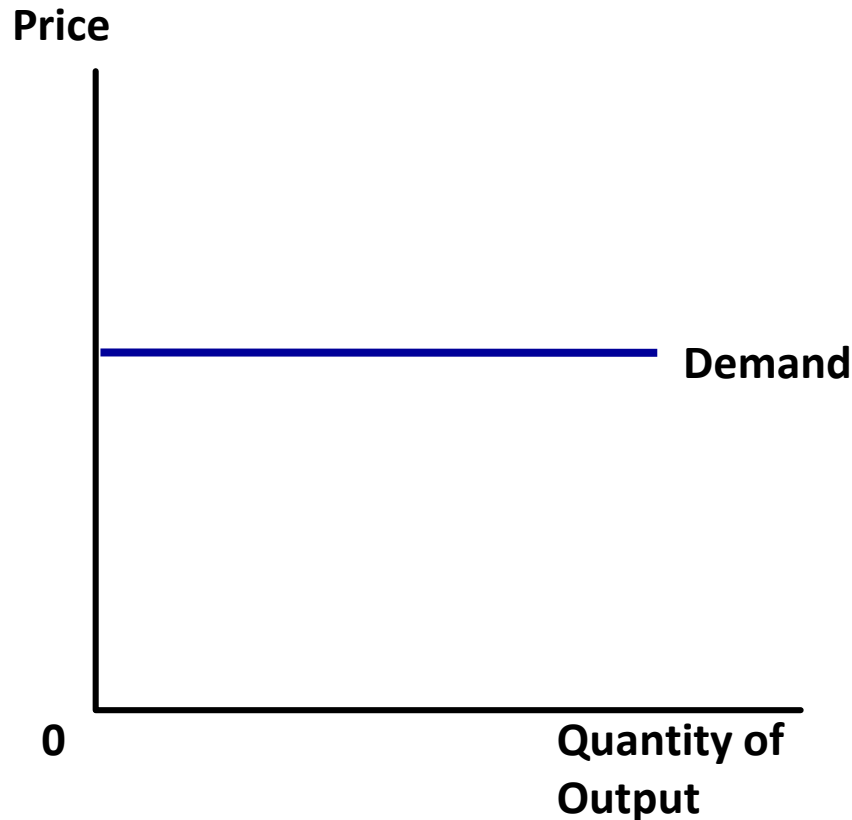
(b) A Monopolist's Demand Curve

Price

Demand

0

Quantity of Output

A Monopoly's Marginal Revenue

A monopolist's marginal revenue is always <u>less than</u> the price of its good.

- ◆ The demand curve is downward sloping.

- ◆ When a monopoly drops the price to sell one more unit, the revenue received from previously sold units also decreases.

A Monopoly's Marginal Revenue

When a monopoly increases the amount it sells, it has two effects on total revenue (P x Q).

- ◆ The output effect—more output is sold, so Q is higher.
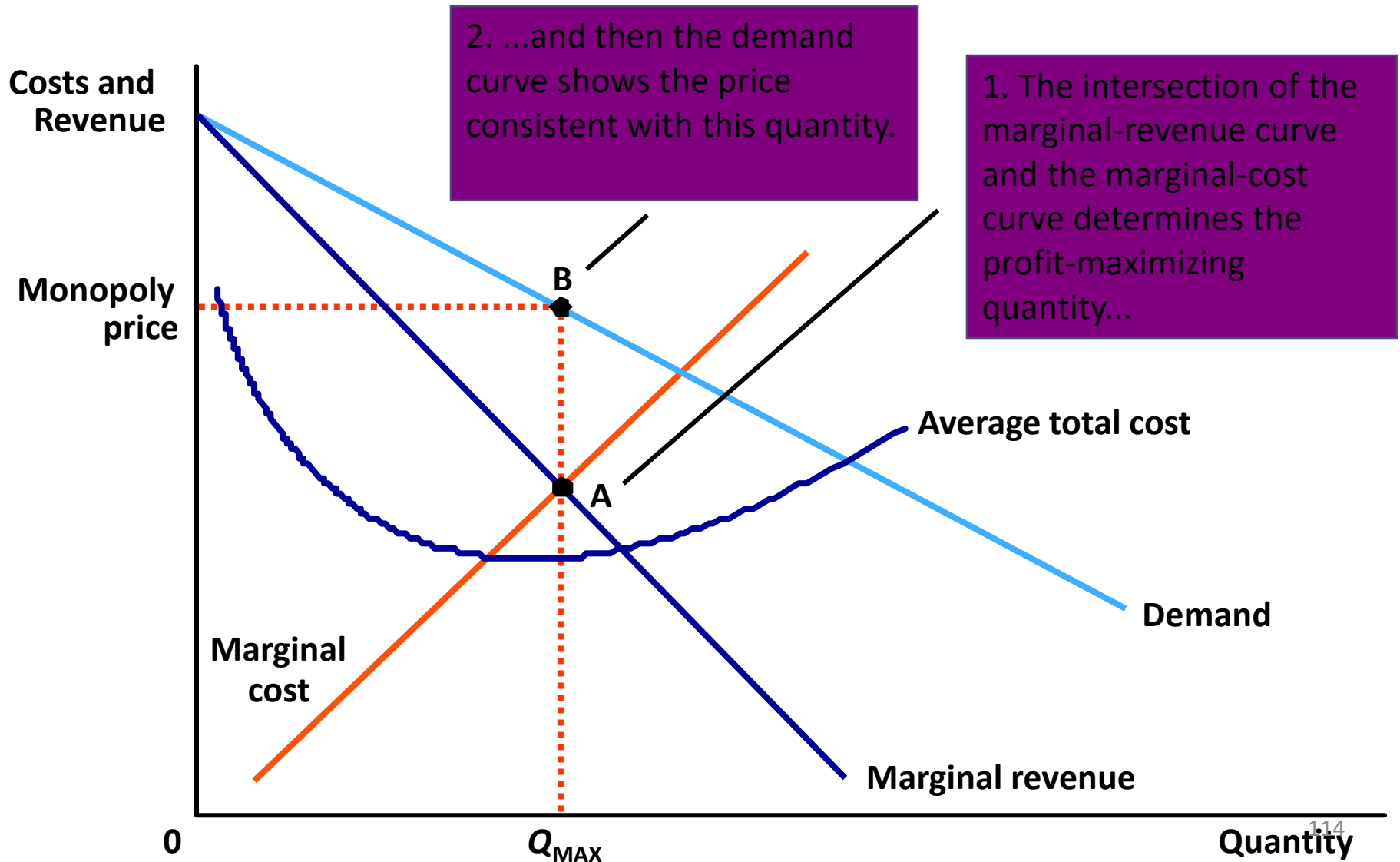
- ◆ The price effect—price falls, so P is lower.

Demand and Marginal Revenue Curves for a Monopoly...
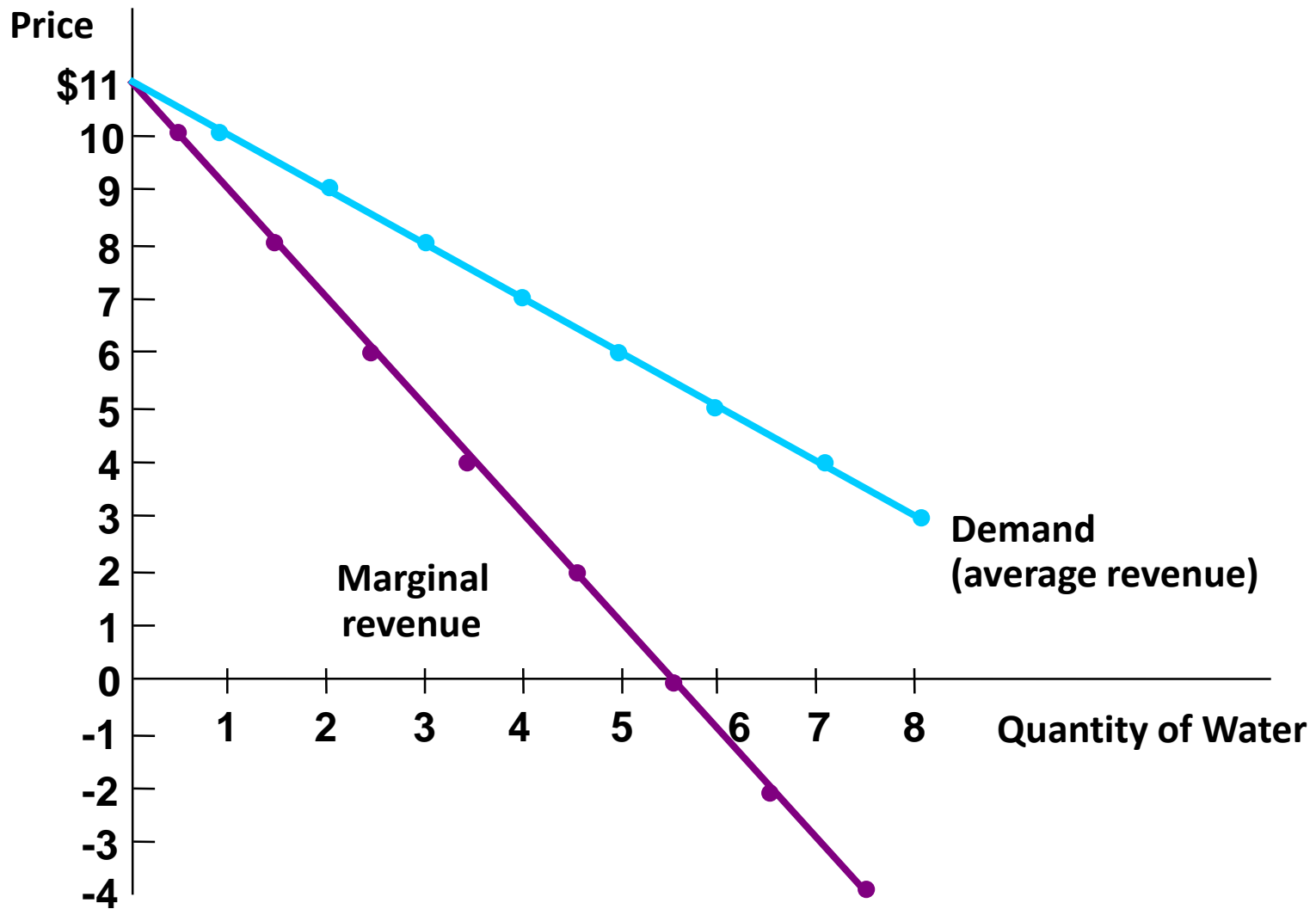
Profit Maximization of a Monopoly

- A monopoly maximizes profit by producing the quantity at which marginal revenue equals marginal cost.

- It then uses the demand curve to find the price that will induce consumers to buy that quantity.

Profit-Maximization for a Monopoly...

Costs and Revenue

2. ...and then the demand curve shows the price consistent with this quantity.

1. The intersection of the marginal-revenue curve and the marginal-cost curve determines the profit-maximizing quantity...

Monopoly price

B

Average total cost

A

Demand

Marginal cost

Marginal revenue

0

Q_{MAX}

Quantity

114

Comparing Monopoly and Competition

- For a competitive firm, price equals marginal cost.

$$P = MR = MC$$

- For a monopoly firm, price exceeds marginal cost.

$$P > MR = MC$$

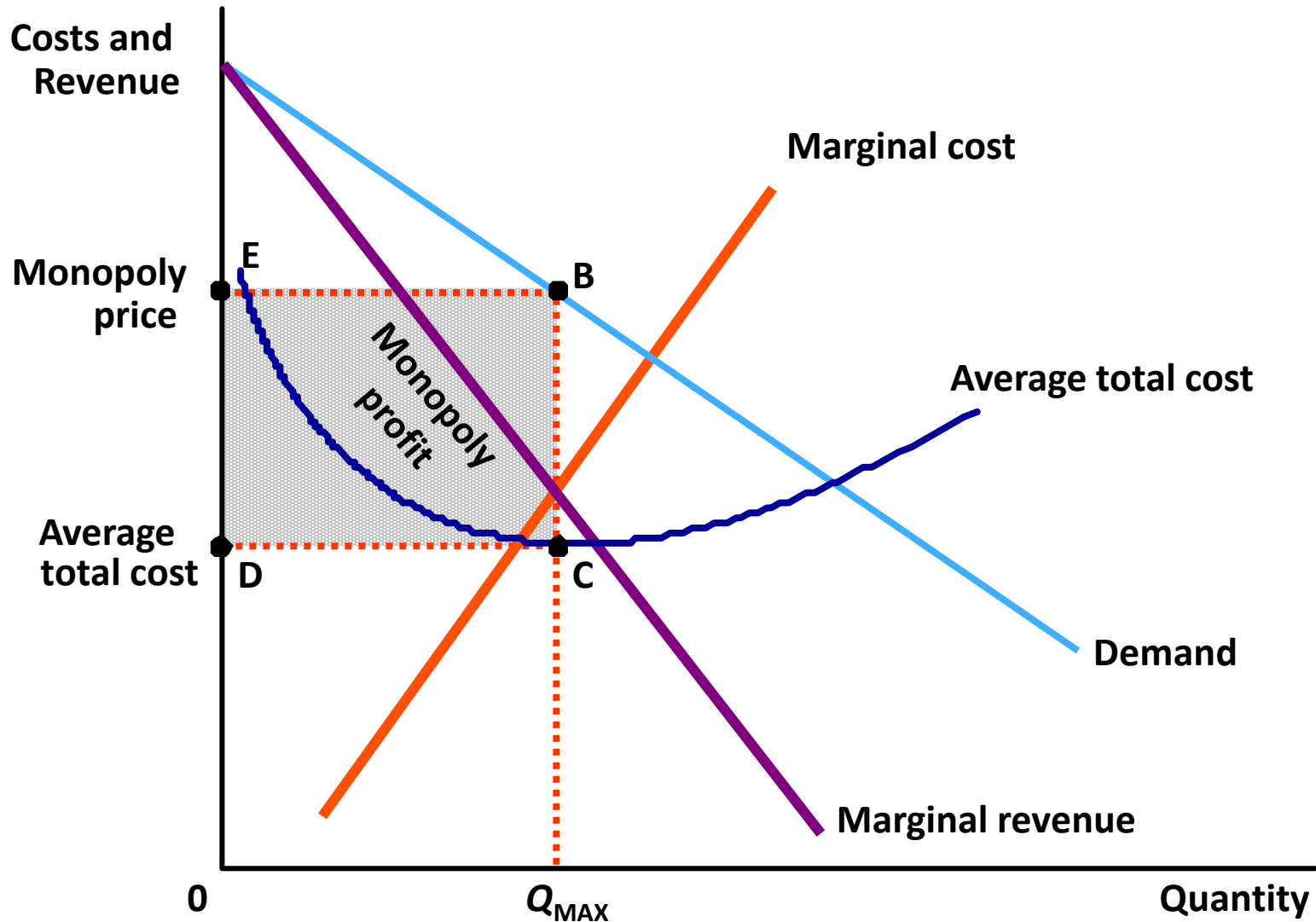# A Monopoly's Profit

Profit equals total revenue minus total costs.

$$\text{Profit} = TR - TC$$

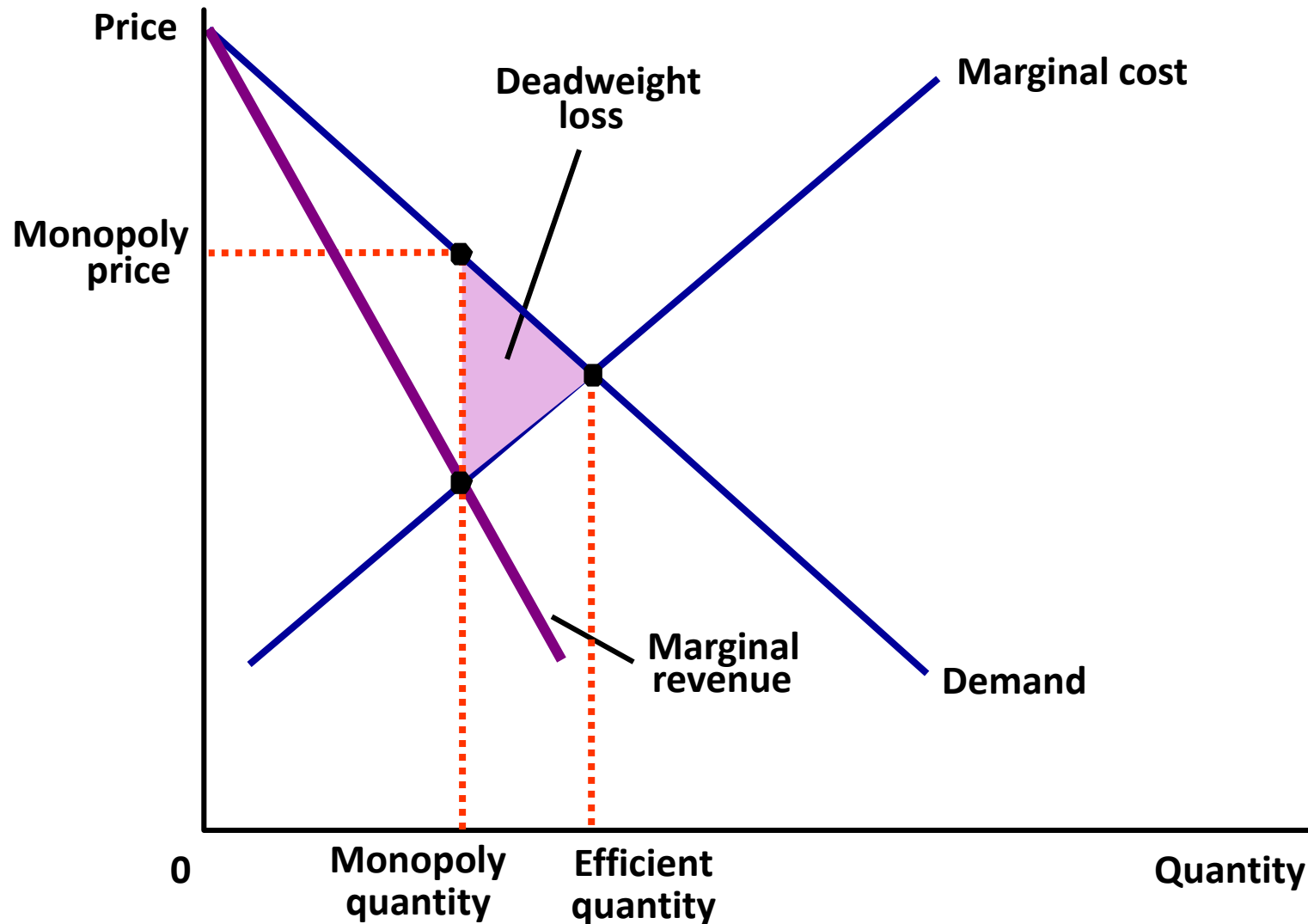$$\text{Profit} = (TR/Q - TC/Q) \times Q$$

$$\text{Profit} = (P - ATC) \times Q$$

The Monopolist's Profit...

The Inefficiency of Monopoly...

Thank You