Elasticity and Its Applications

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Elasticity and Its Applications

The elasticity of demand

The price elasticity of demand and its Determinants

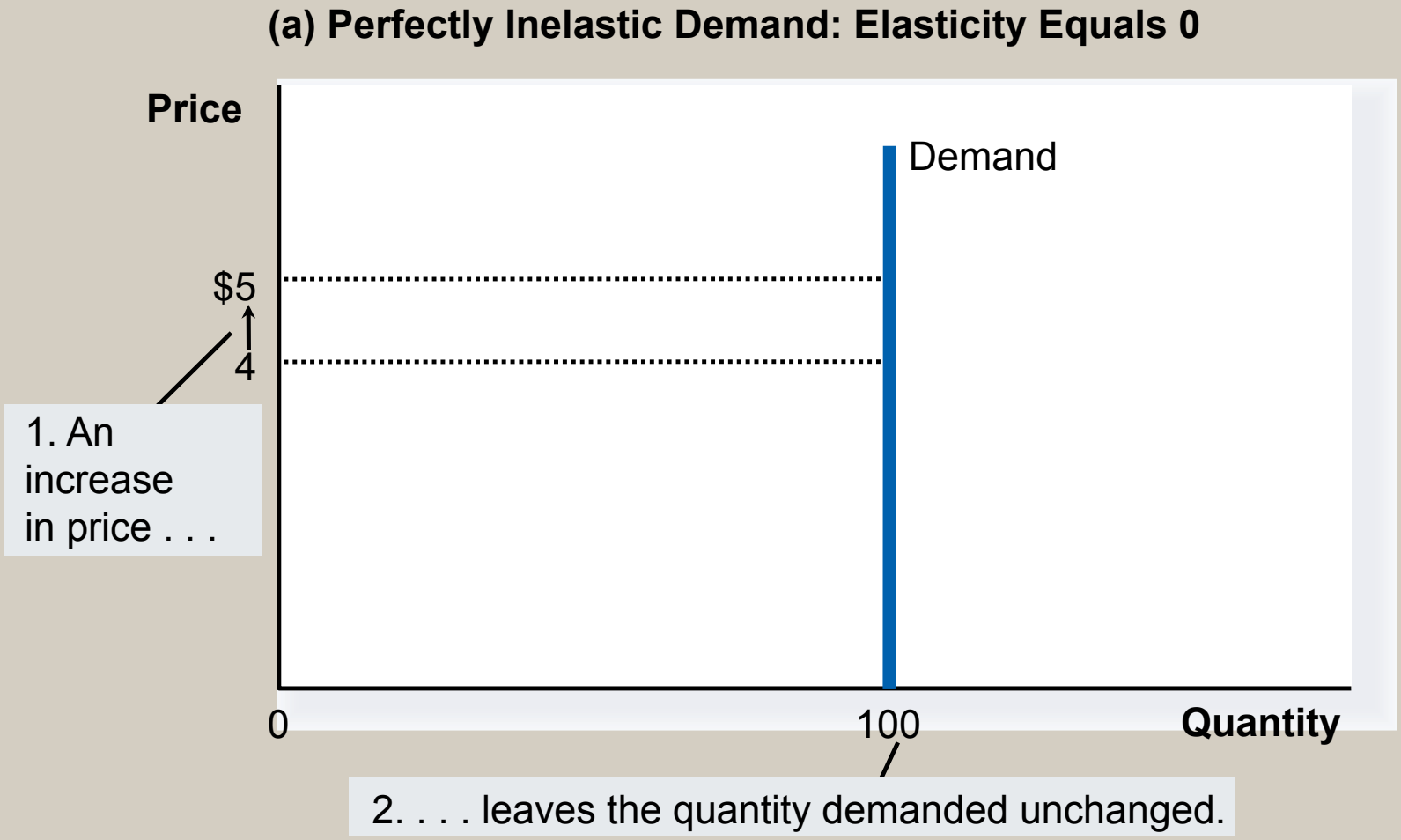
- ✓ Availability of close substitutes
- ✓ Necessities versus Luxuries
- ✓ Definition of Market
- ✓ Time horizon

The price elasticity of demand

$$E_d = \frac{\Delta D / D}{\Delta P / P}$$

The variety of demand curves

Figure 1 The Price Elasticity of Demand



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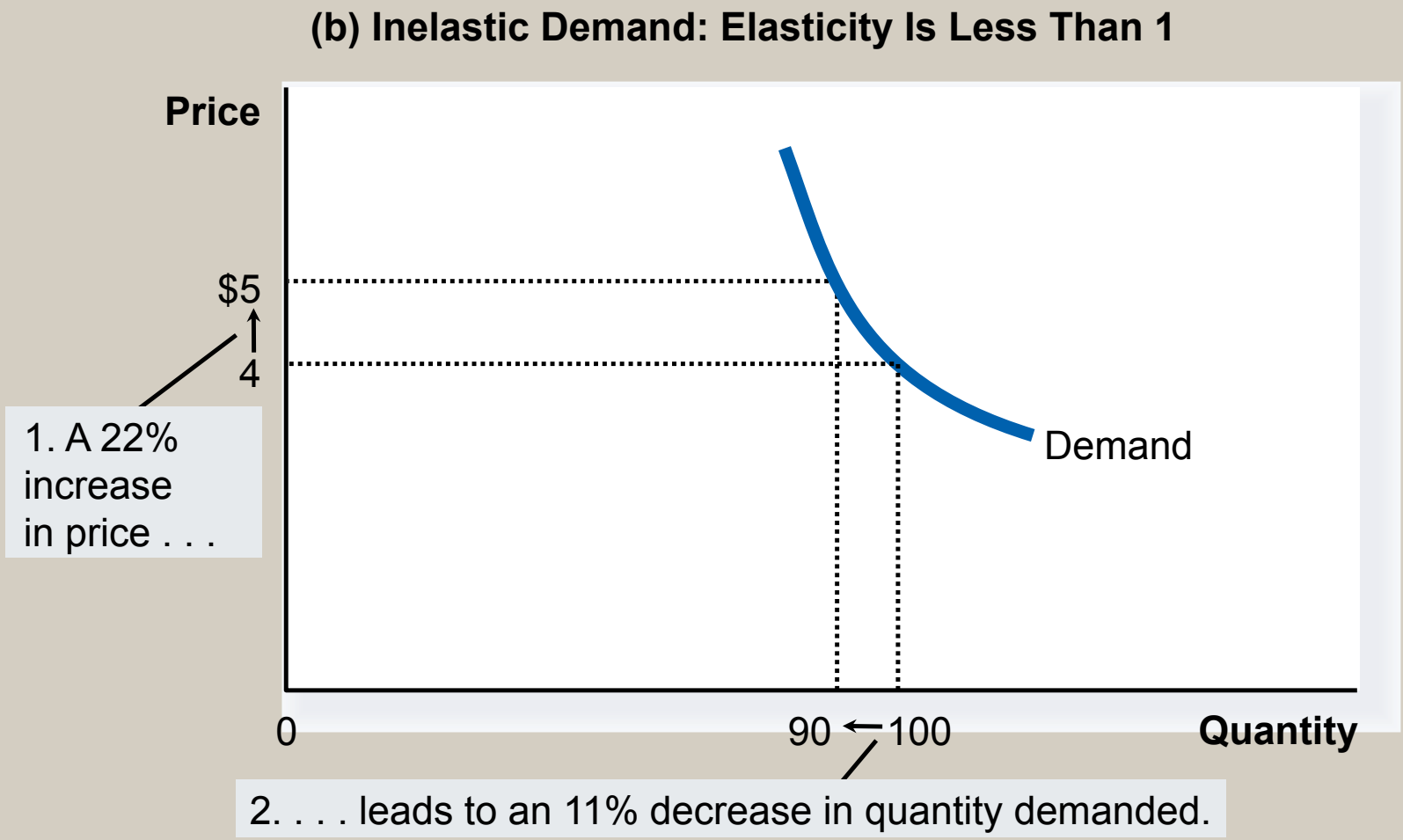

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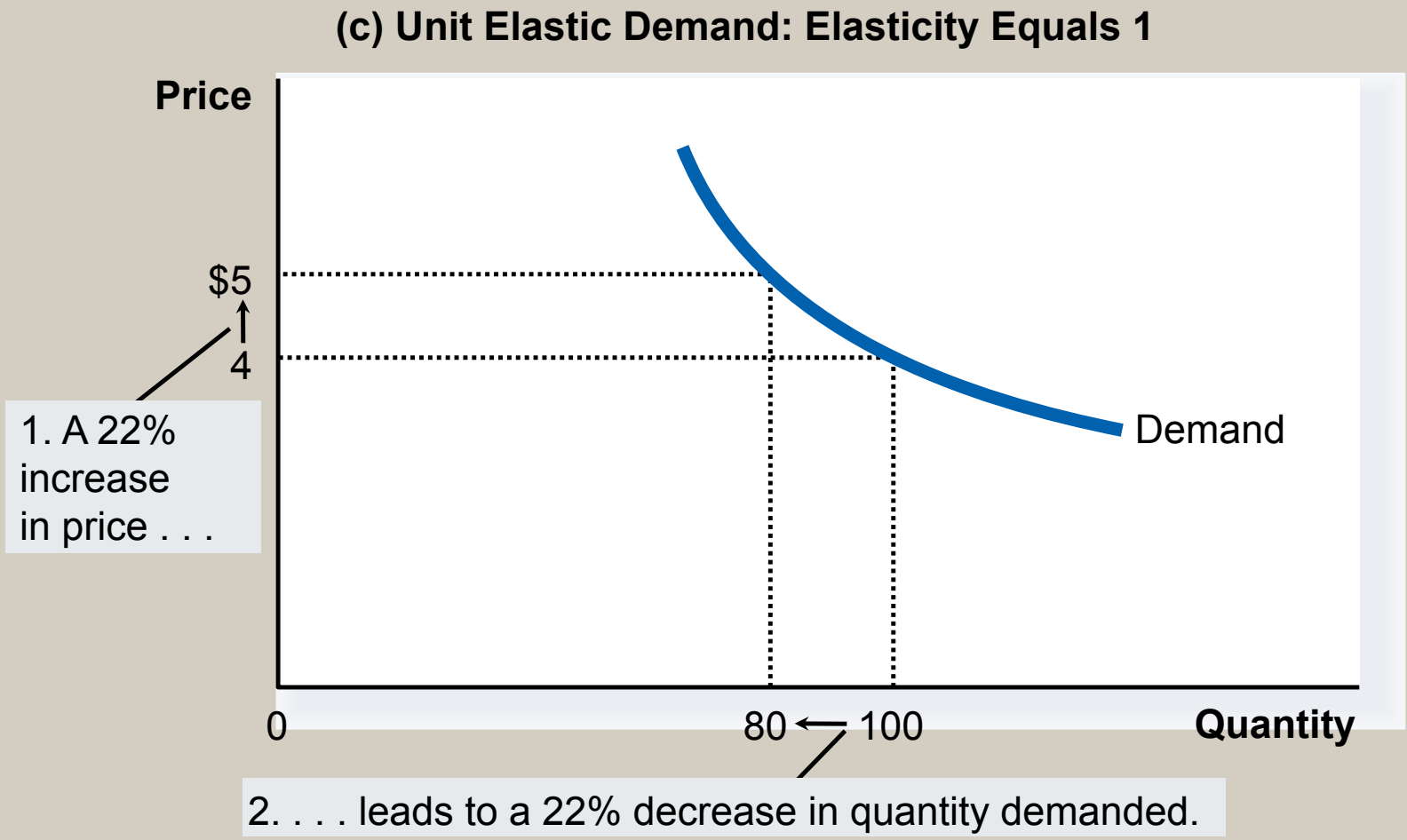

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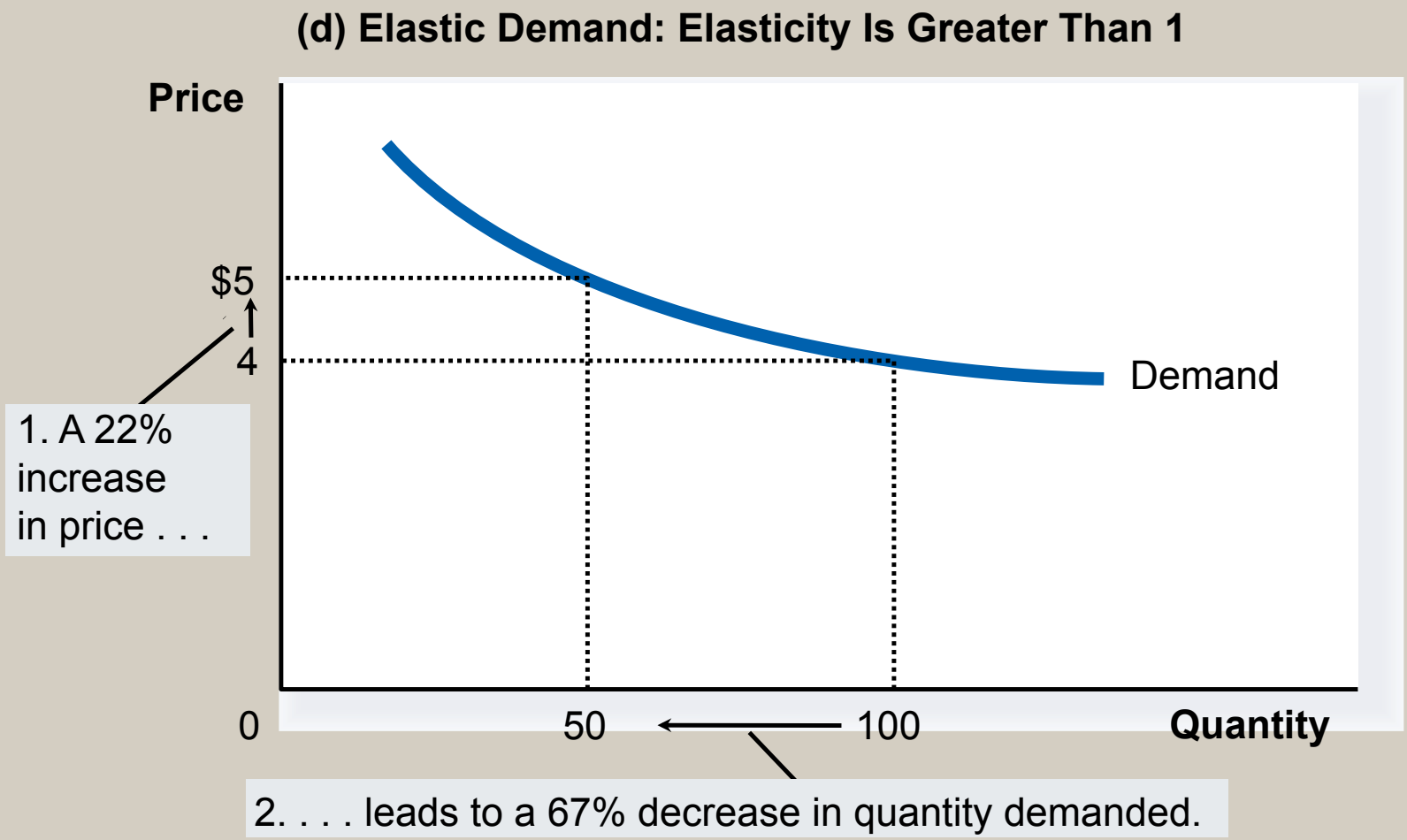

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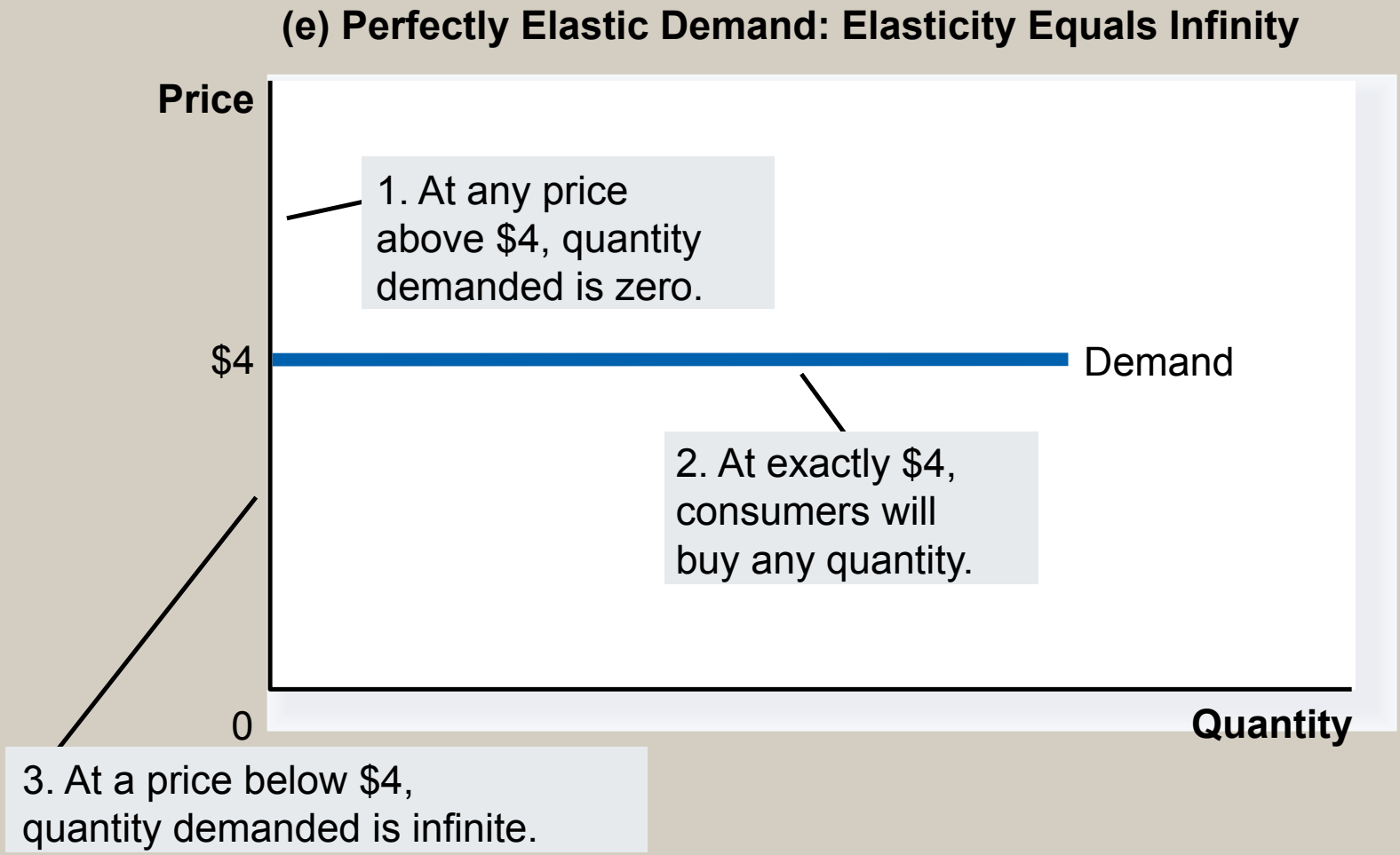


Total Revenue and the Price Elasticity of Demand

- *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.

$$TR = P \times Q$$

Figure 2 Total Revenue

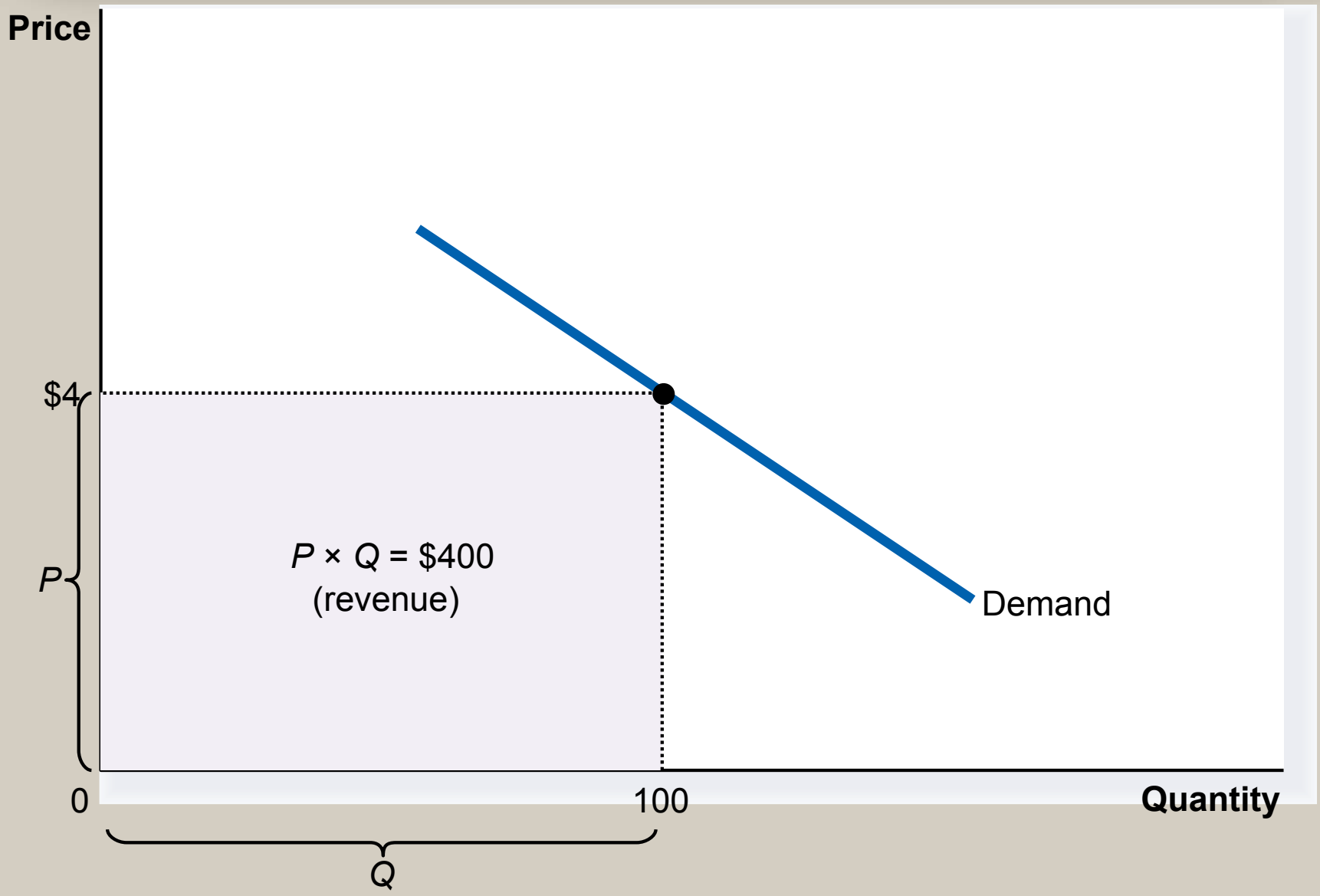
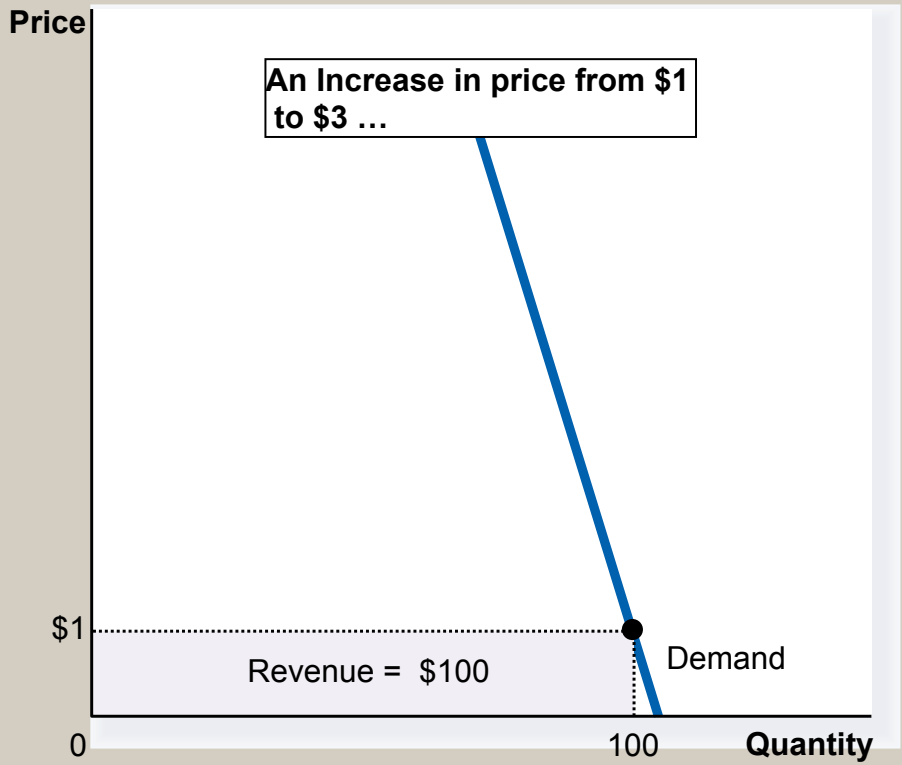
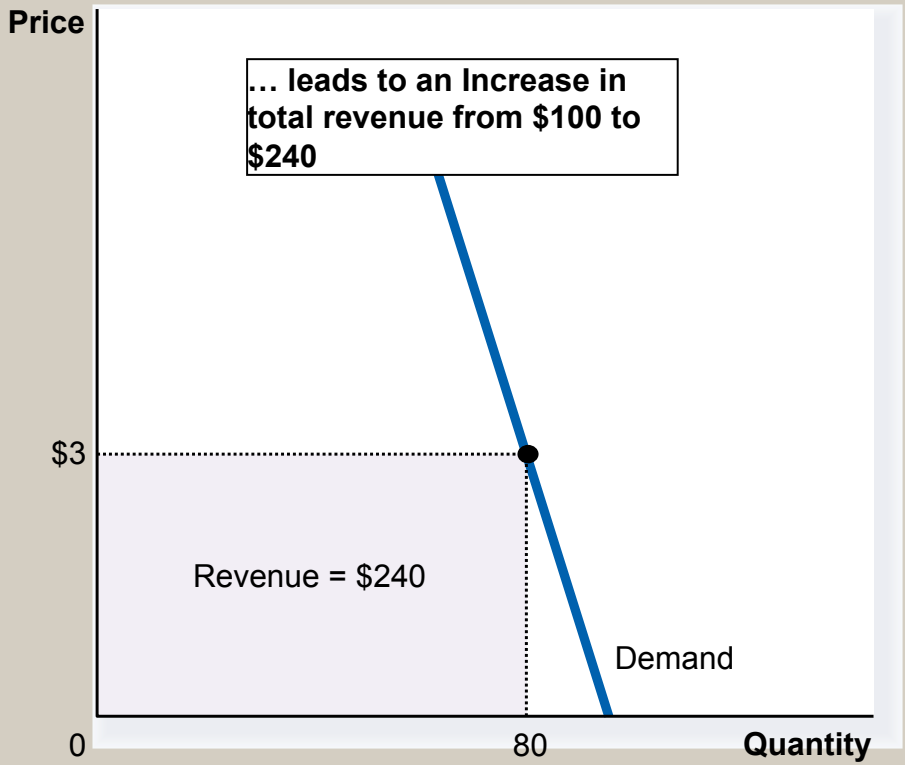


Figure 3 How Total Revenue Changes When Price Changes: Inelastic Demand

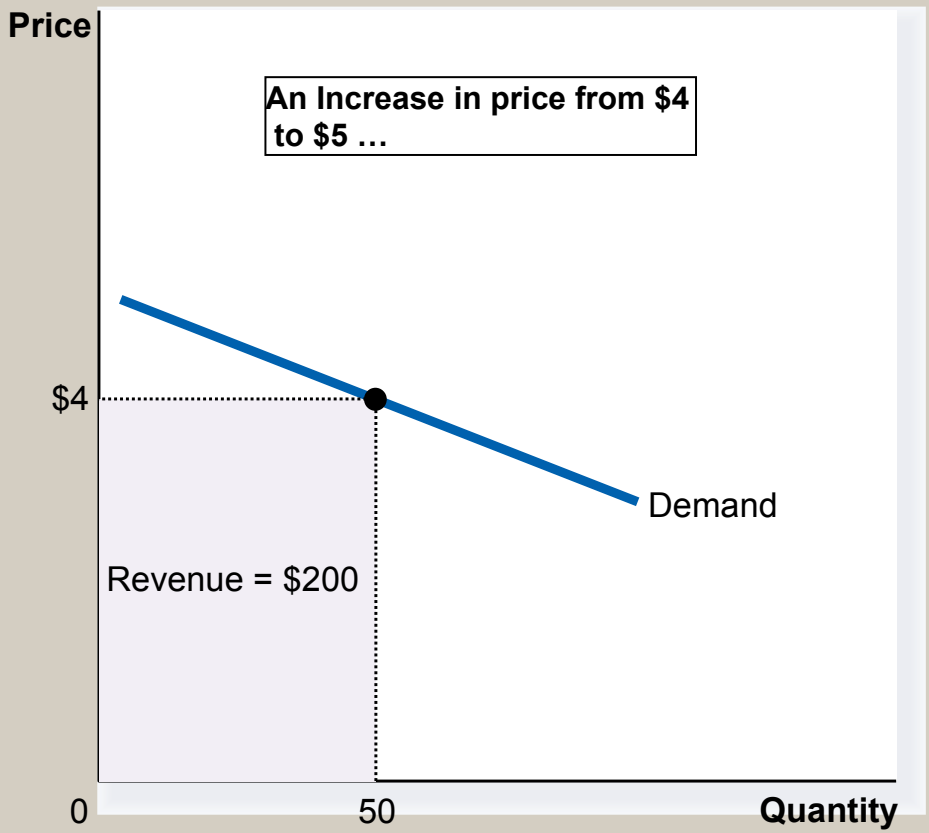


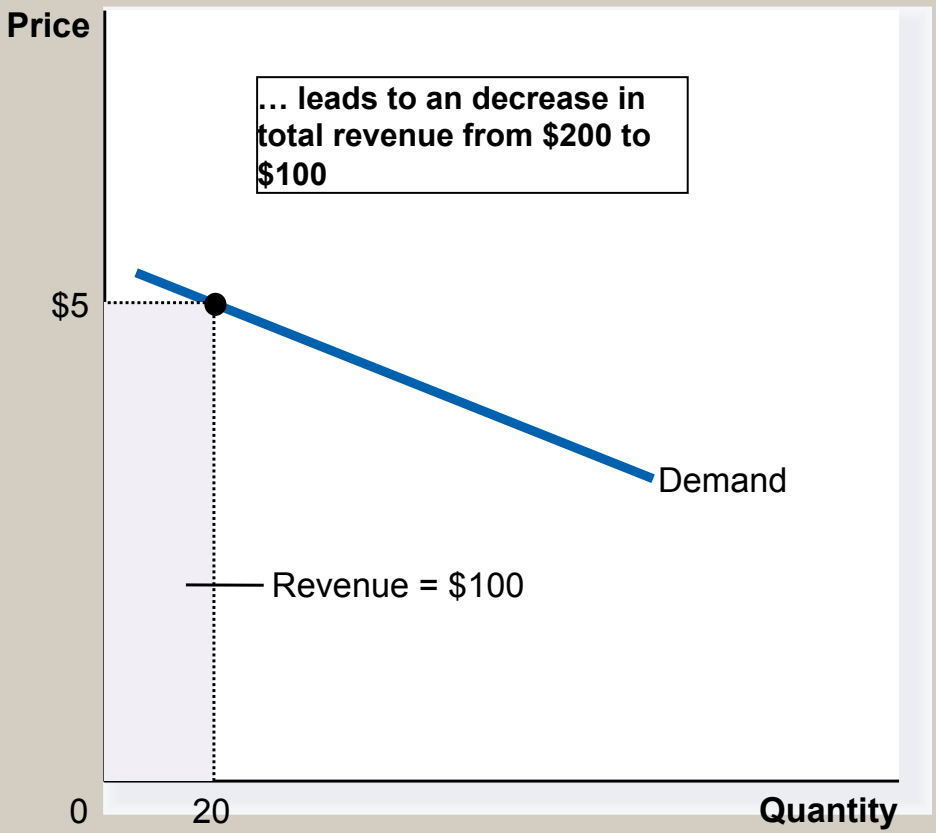


Elasticity and Total Revenue along a Linear Demand Curve

- With an elastic demand curve, an increase in the price leads to a decrease in quantity demanded that is proportionately larger. Thus, *total revenue decreases*.

Figure 4 How Total Revenue Changes When Price Changes: Elastic Demand





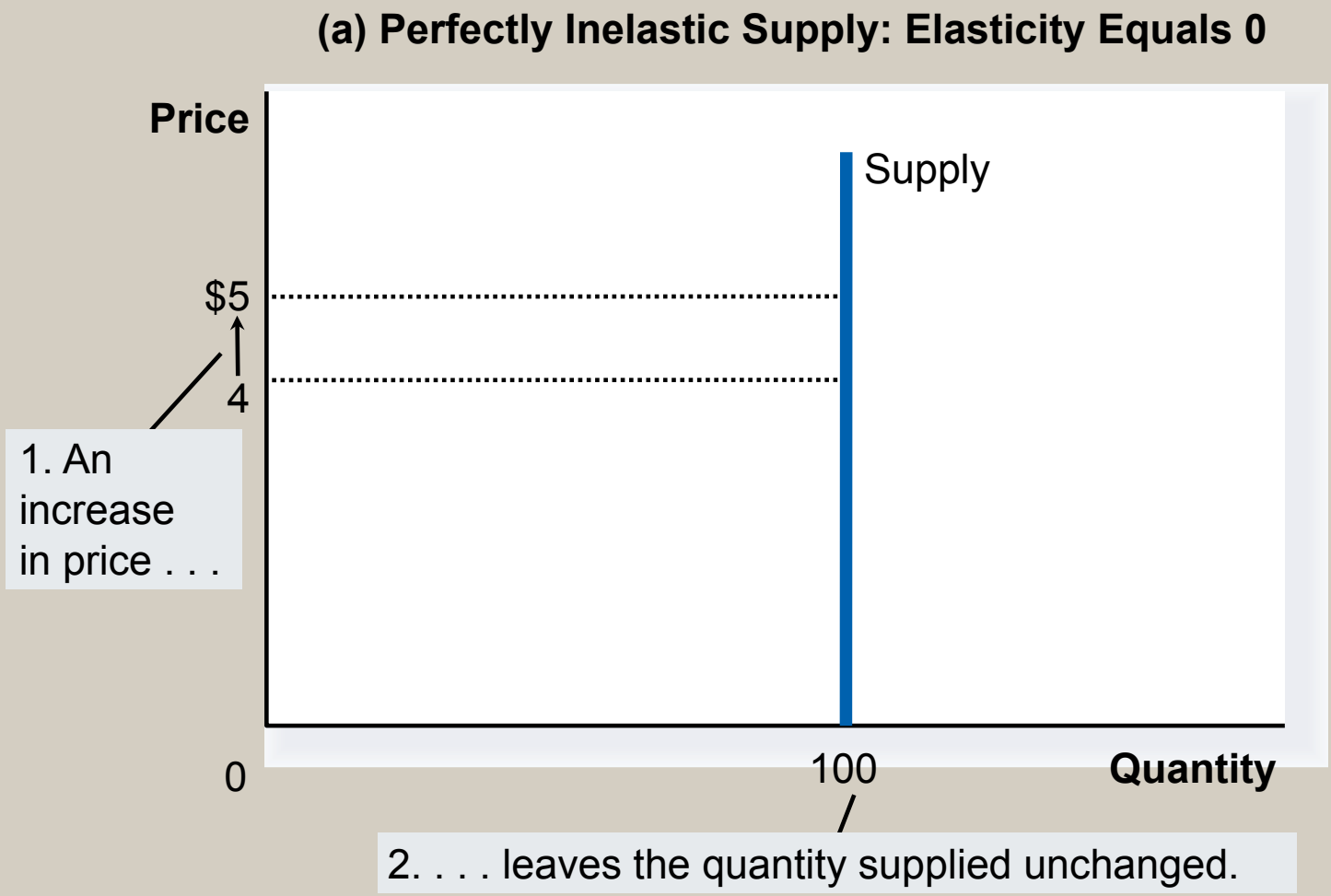
- The elasticity of Supply

The price elasticity of supply and its determinants

$$E_s = \frac{\Delta S / S}{\Delta P / P}$$

The variety of supply curves

Figure 6 The Price Elasticity of Supply



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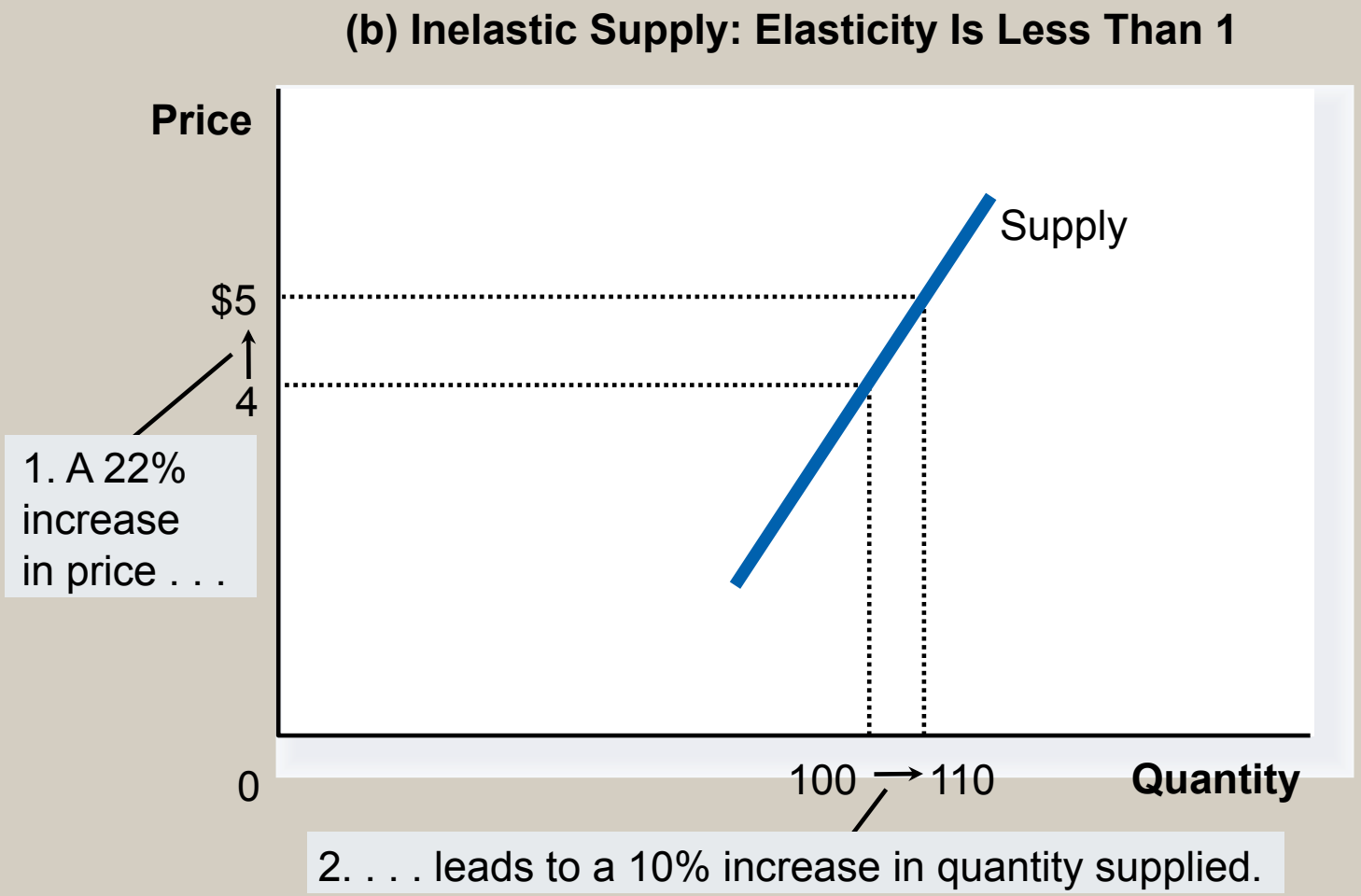

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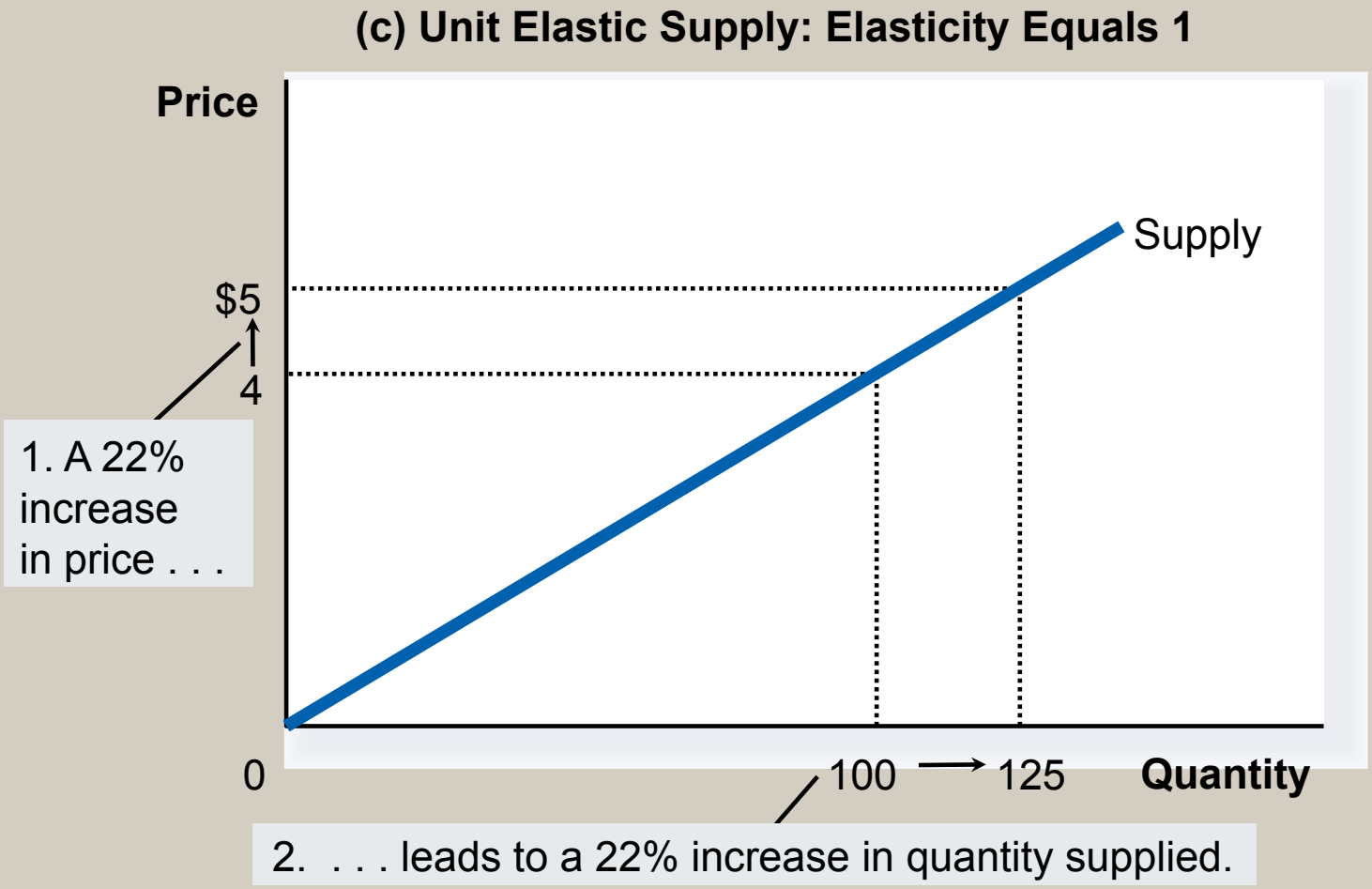

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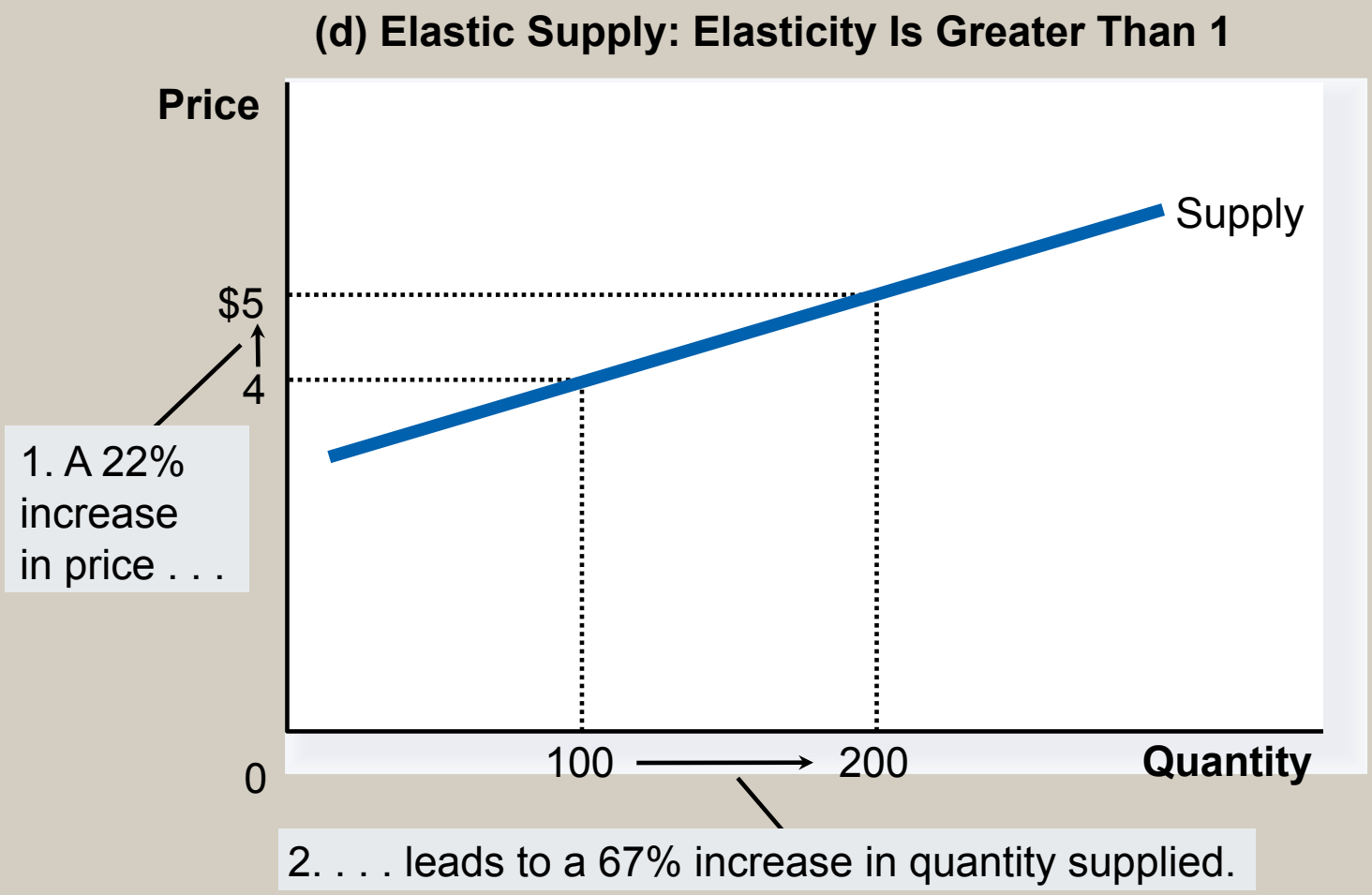

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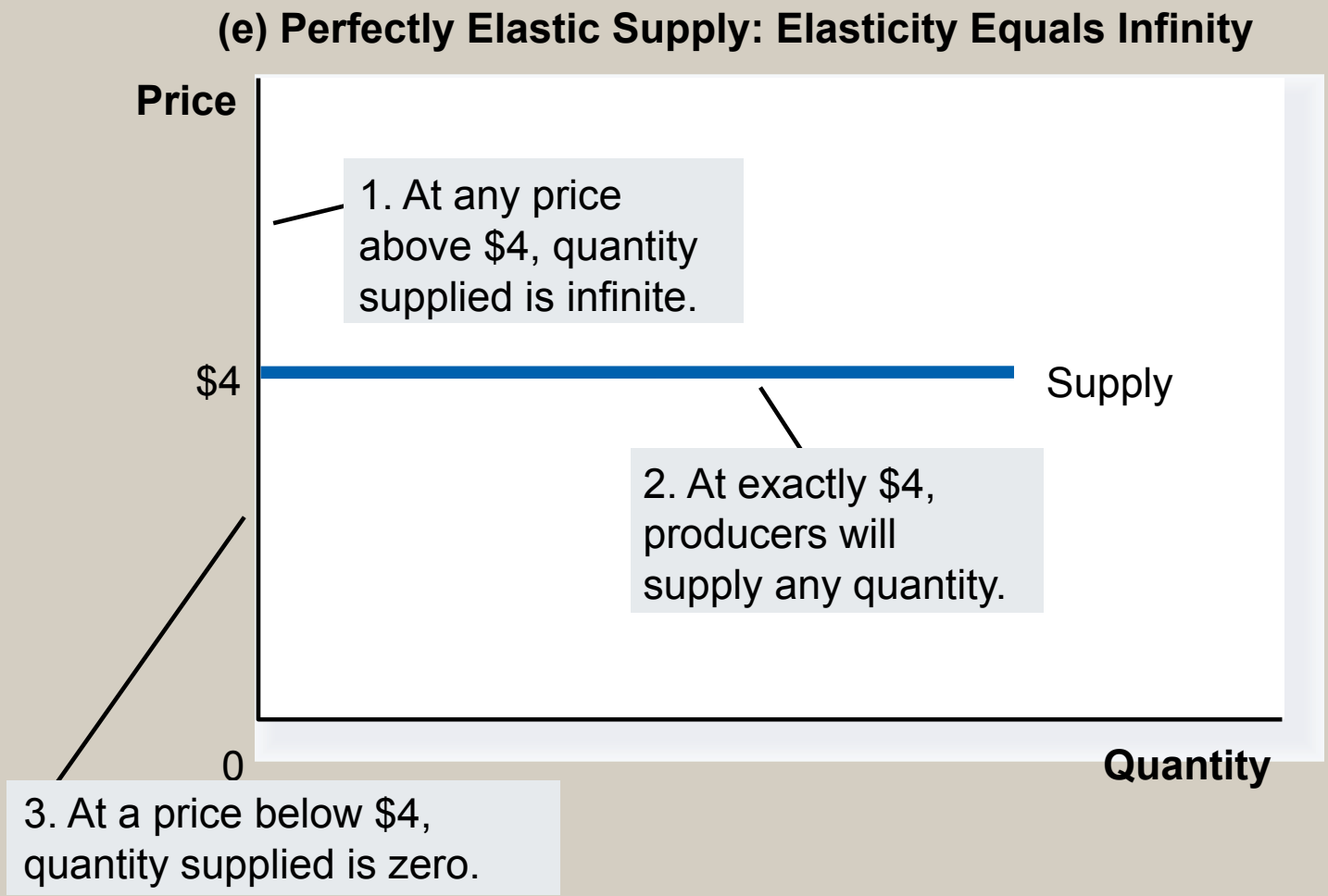


Determinants of Elasticity of Supply

- Ability of sellers to change the amount of the good they produce.
  - Beach-front land is inelastic.
  - Books, cars, or manufactured goods are elastic.
- Time period.
  - Supply is more elastic in the long run.

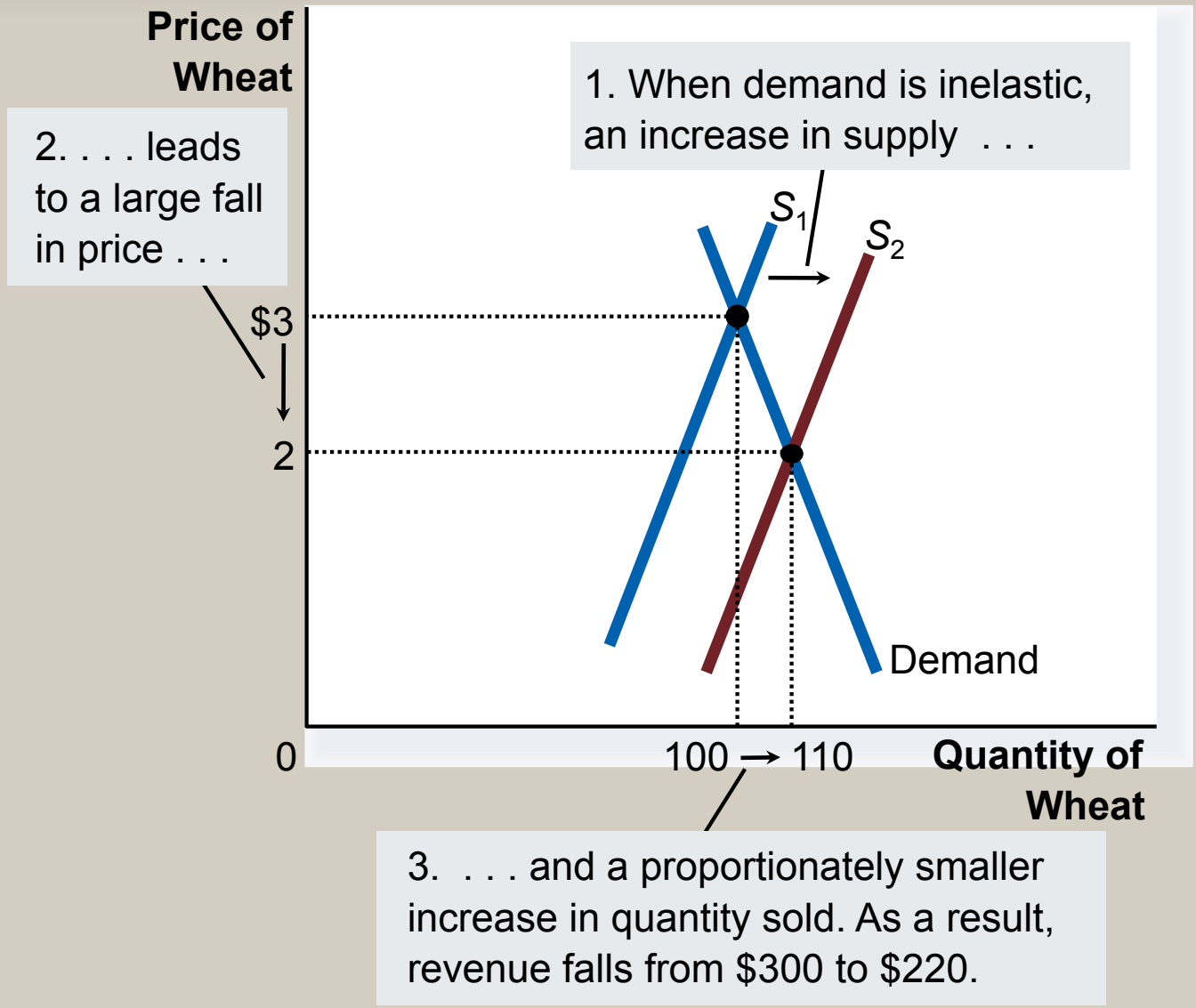
THREE APPLICATIONS OF SUPPLY, DEMAND, AND ELASTICITY

- Can good news for farming be bad news for farmers?
- What happens to wheat farmers and the market for wheat when university agronomists discover a new wheat hybrid that is more productive than existing varieties?

THREE APPLICATIONS OF SUPPLY, DEMAND, AND ELASTICITY

- Examine whether the supply or demand curve shifts.
- Determine the direction of the shift of the curve.
- Use the supply-and-demand diagram to see how the market equilibrium changes.

Figure 8 An Increase in Supply in the Market for Wheat



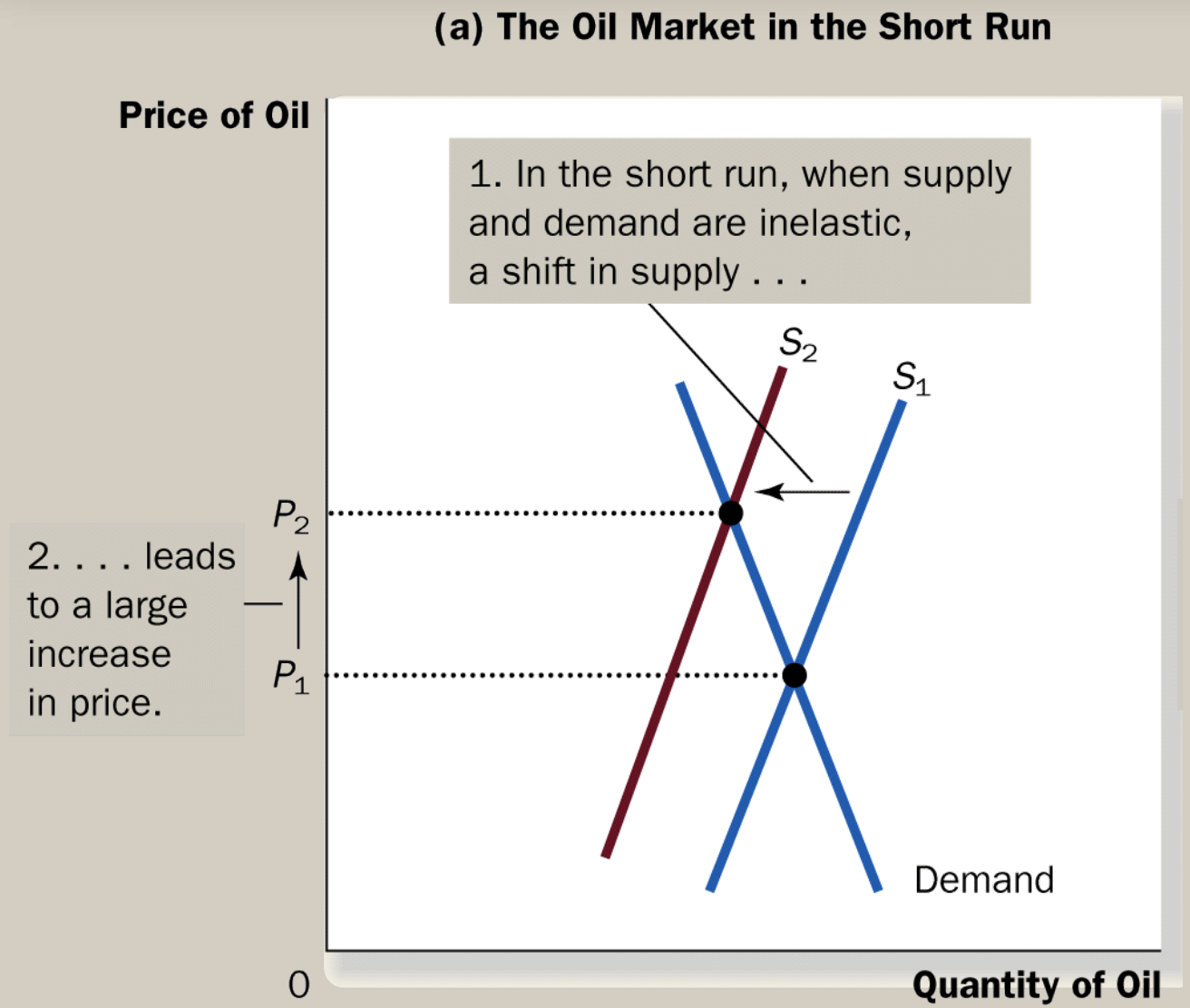
Compute the Price Elasticity of Supply

$$E_D = \frac{\dfrac{100 - 110}{(100 + 110)/2}}{\dfrac{3.00 - 2.00}{(3.00 + 2.00)/2}}$$

$$= \frac{-0.095}{0.4} \approx -0.24$$

Supply is inelastic

Why did OPEC fail to keep the price of oil high?



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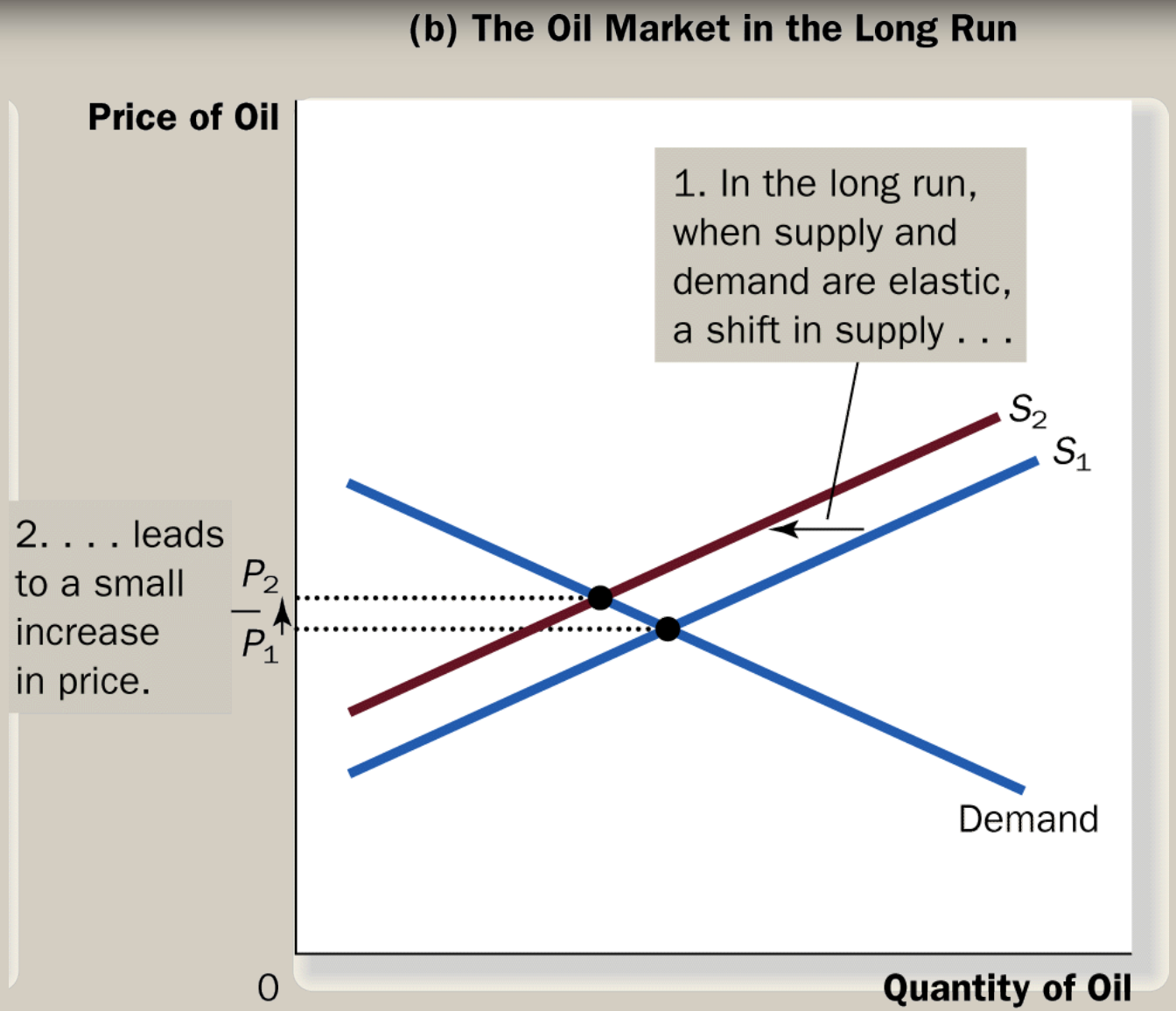
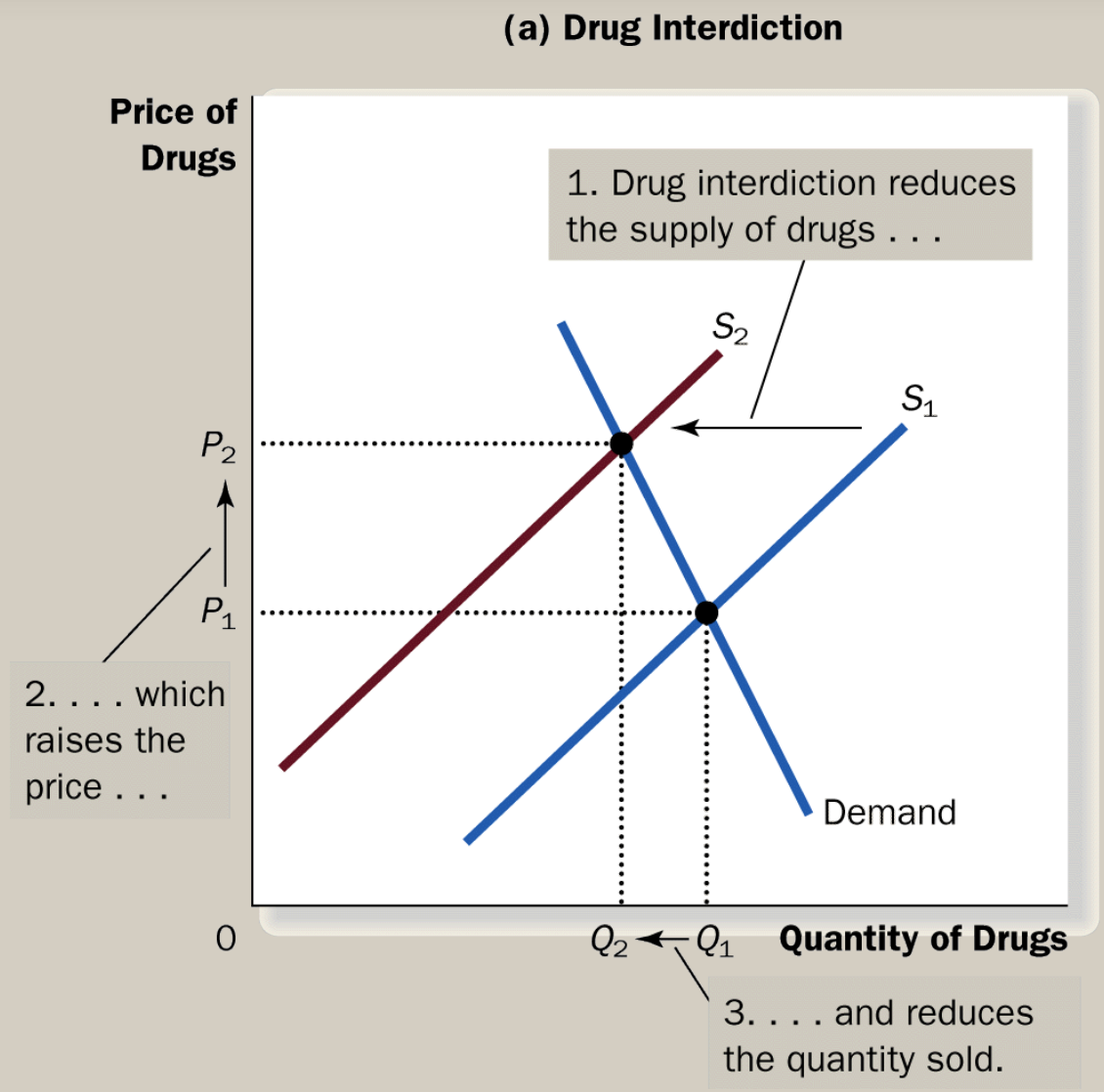
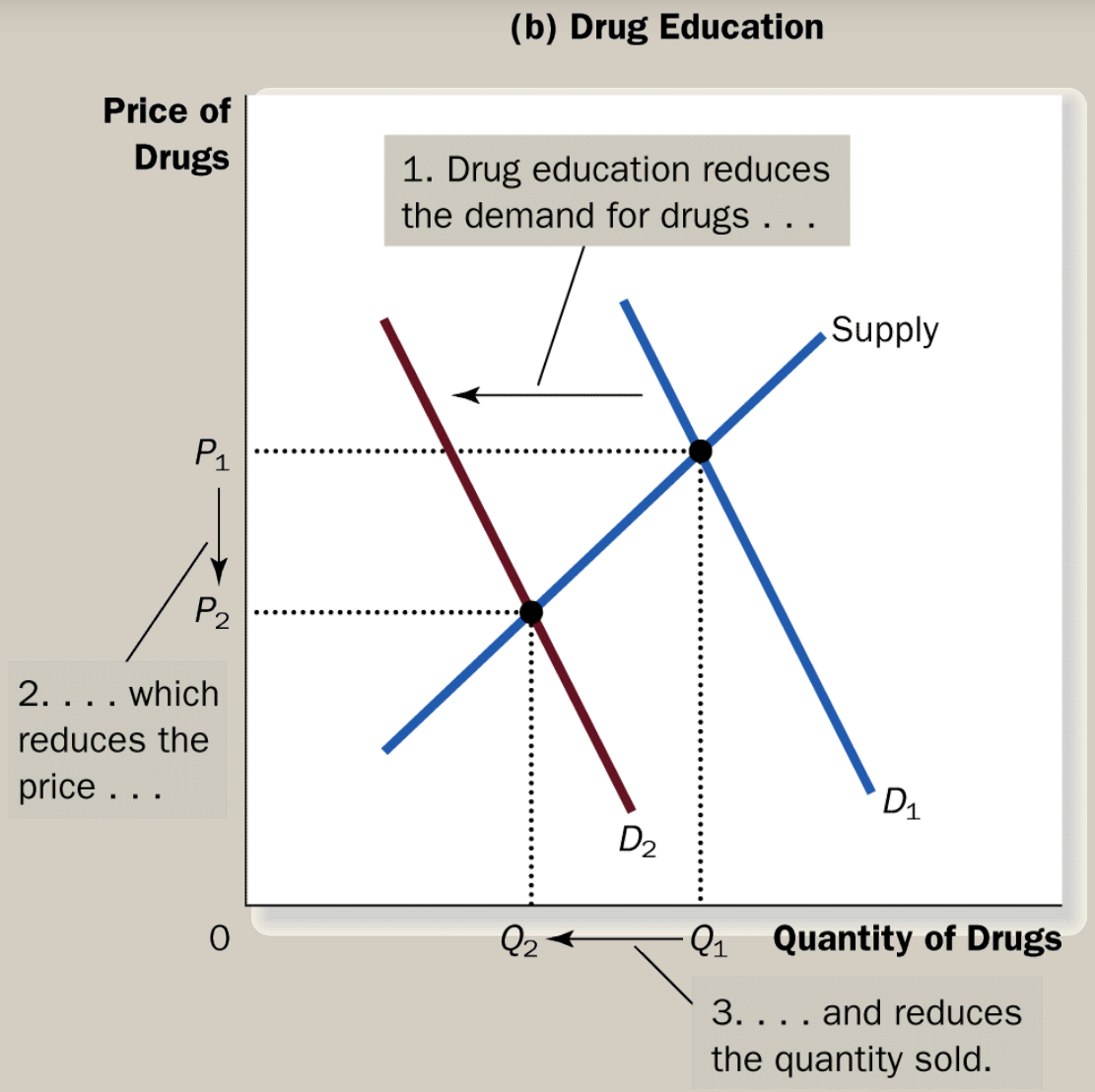


Does drug interdiction increase or decrease drug-related crime?



Policies to Reduce the Use of Illegal Drugs



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Supply, Demand, and Government Policies

Supply, Demand, and Government Policies

- In a free, unregulated market system, market forces establish equilibrium prices and exchange quantities.
- While equilibrium conditions may be efficient, it may be true that not everyone is satisfied.
- One of the roles of economists is to use their theories to assist in the development of policies.

CONTROLS ON PRICES

- Are usually enacted when policymakers believe the market price is unfair to buyers or sellers.
- Result in government-created price ceilings and floors.

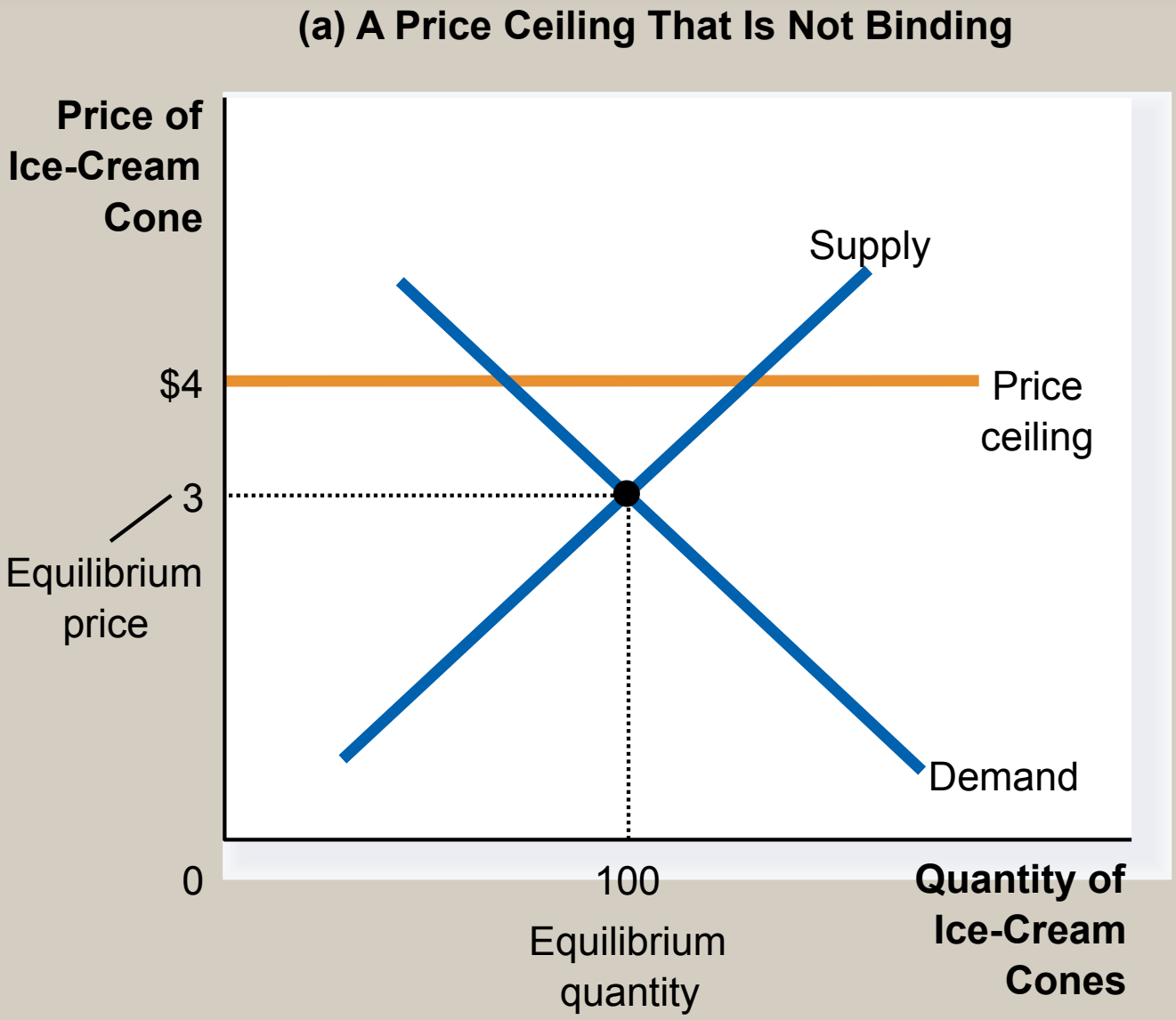
CONTROLS ON PRICES

- *Price Ceiling*
  - A legal *maximum* on the price at which a good can be sold.
- *Price Floor*
  - A legal *minimum* on the price at which a good can be sold.

How Price Ceilings Affect Market Outcomes

- Two outcomes are possible when the government imposes a price ceiling:
  - The price ceiling *is not* binding if set *above* the equilibrium price.
  - The price ceiling *is* binding if set *below* the equilibrium price, leading to a shortage.

Figure 1 A Market with a Price Ceiling



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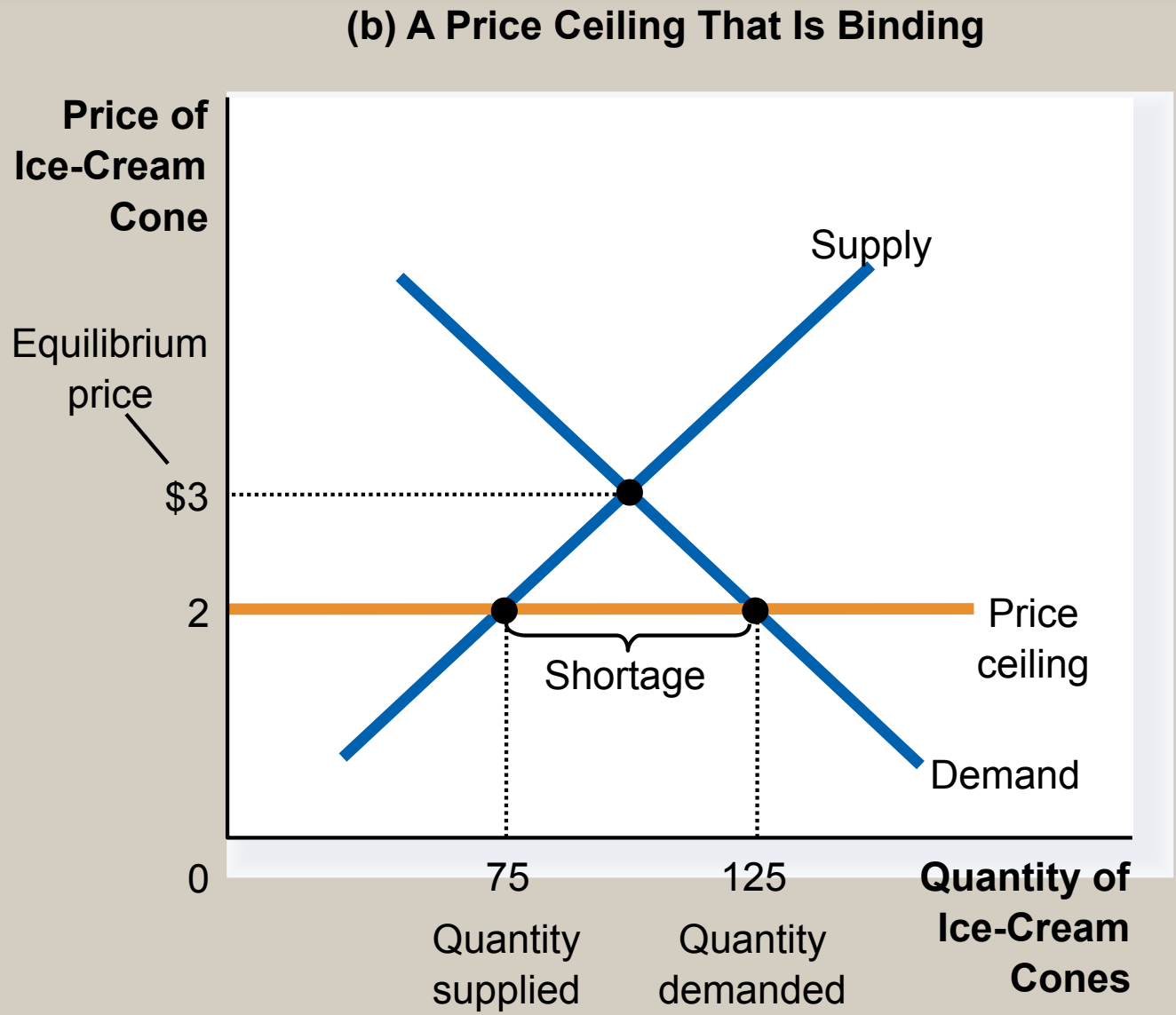


How Price Ceilings Affect Market Outcomes

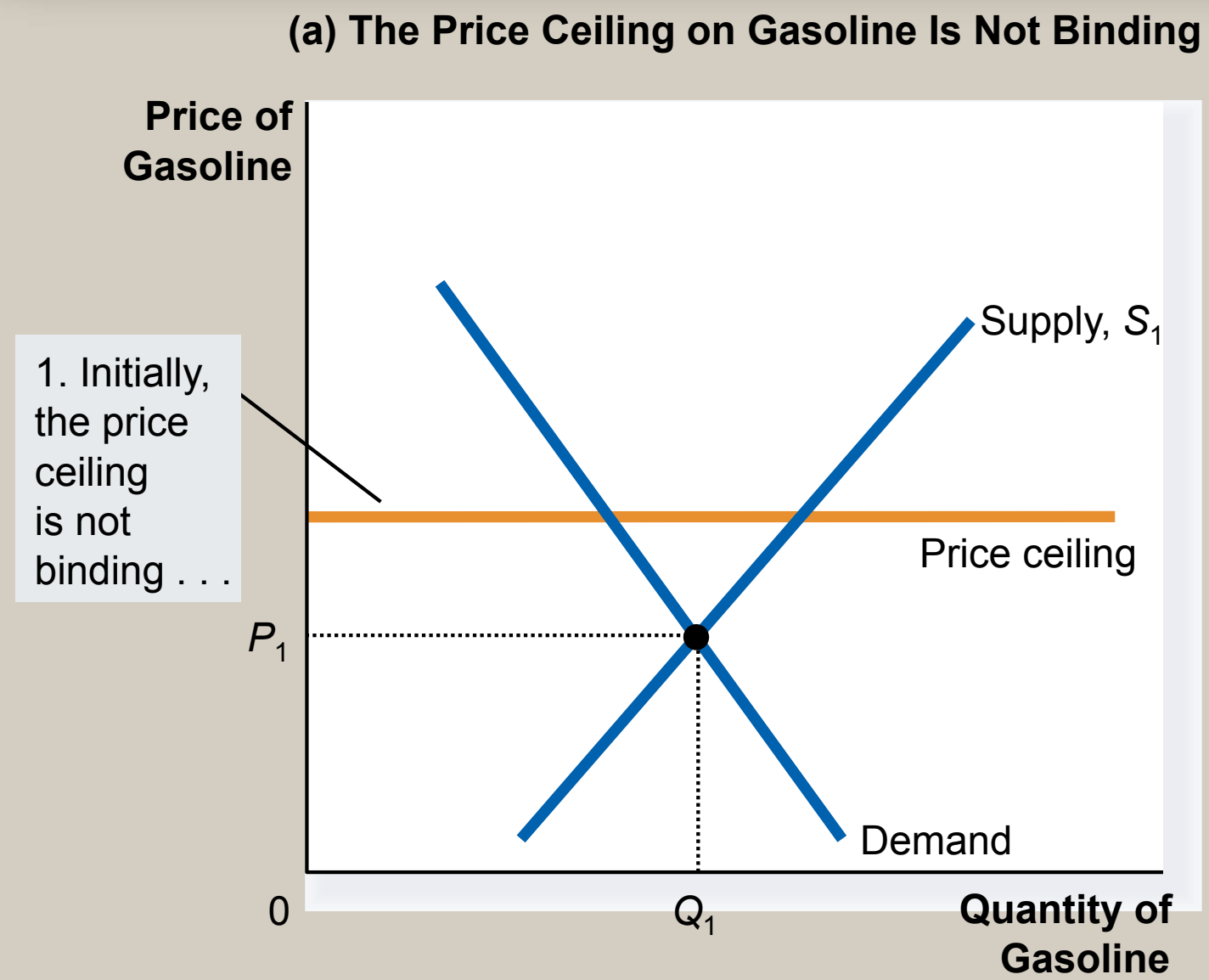
- Effects of Price Ceilings
- A binding price ceiling creates
  - shortages because $Q_D > Q_S$.
    - Example: Gasoline shortage of the 1970s
  - nonprice rationing
    - Examples: Long lines, discrimination by sellers

CASE STUDY: Lines at the Gas Pump

- In 1973, OPEC raised the price of crude oil in world markets. Crude oil is the major input in gasoline, so the higher oil prices reduced the supply of gasoline.
- What was responsible for the long gas lines?

- Economists blame government regulations that limited the price oil companies could charge for gasoline.

Figure 2 The Market for Gasoline with a Price Ceiling



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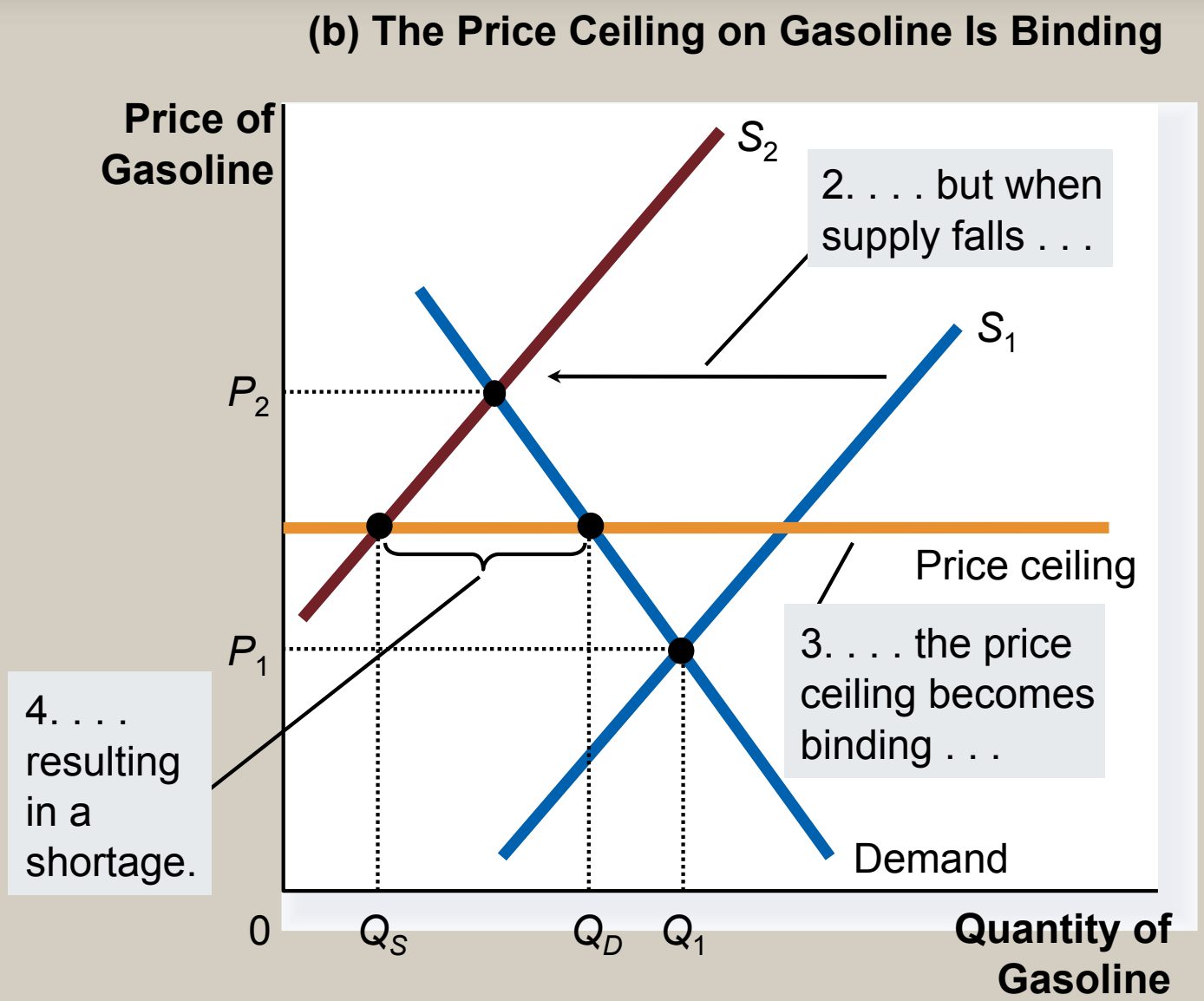
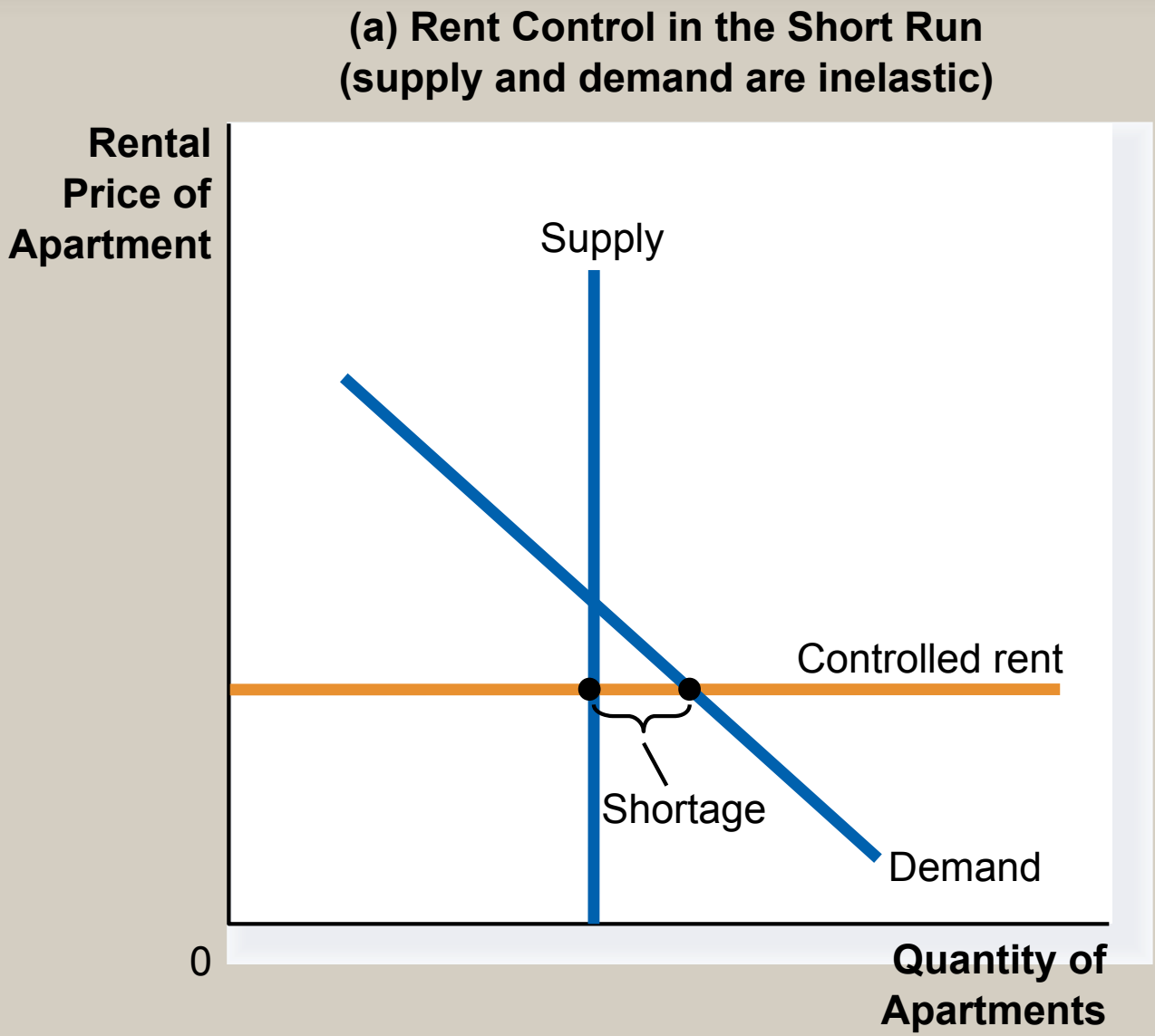


CASE STUDY: Rent Control in the Short Run and Long Run

- Rent controls are ceilings placed on the rents that landlords may charge their tenants.
- The goal of rent control policy is to help the poor by making housing more affordable.
- One economist called rent control “the best way to destroy a city, other than bombing.”

Figure 3 Rent Control in the Short Run and in the Long Run



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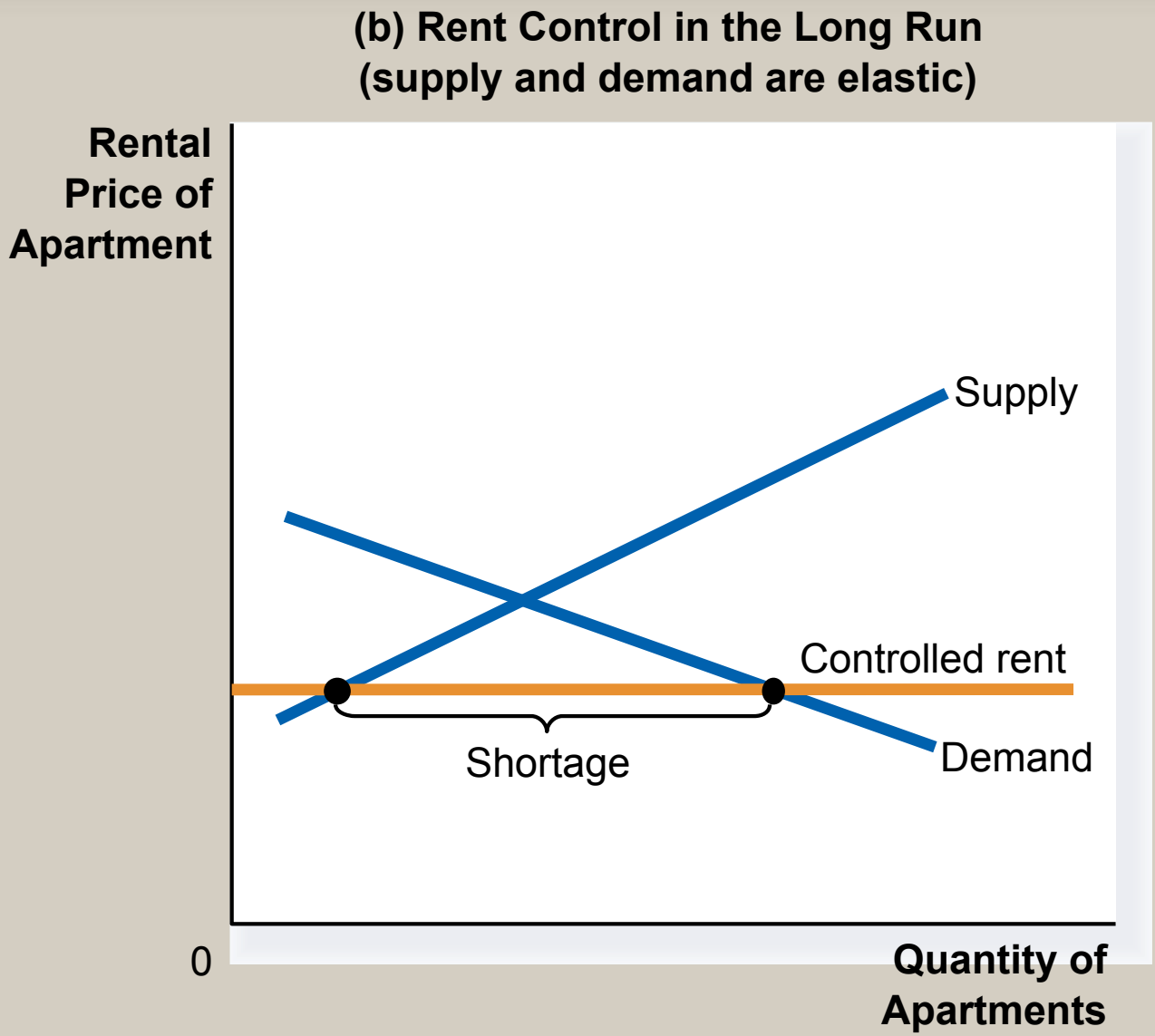
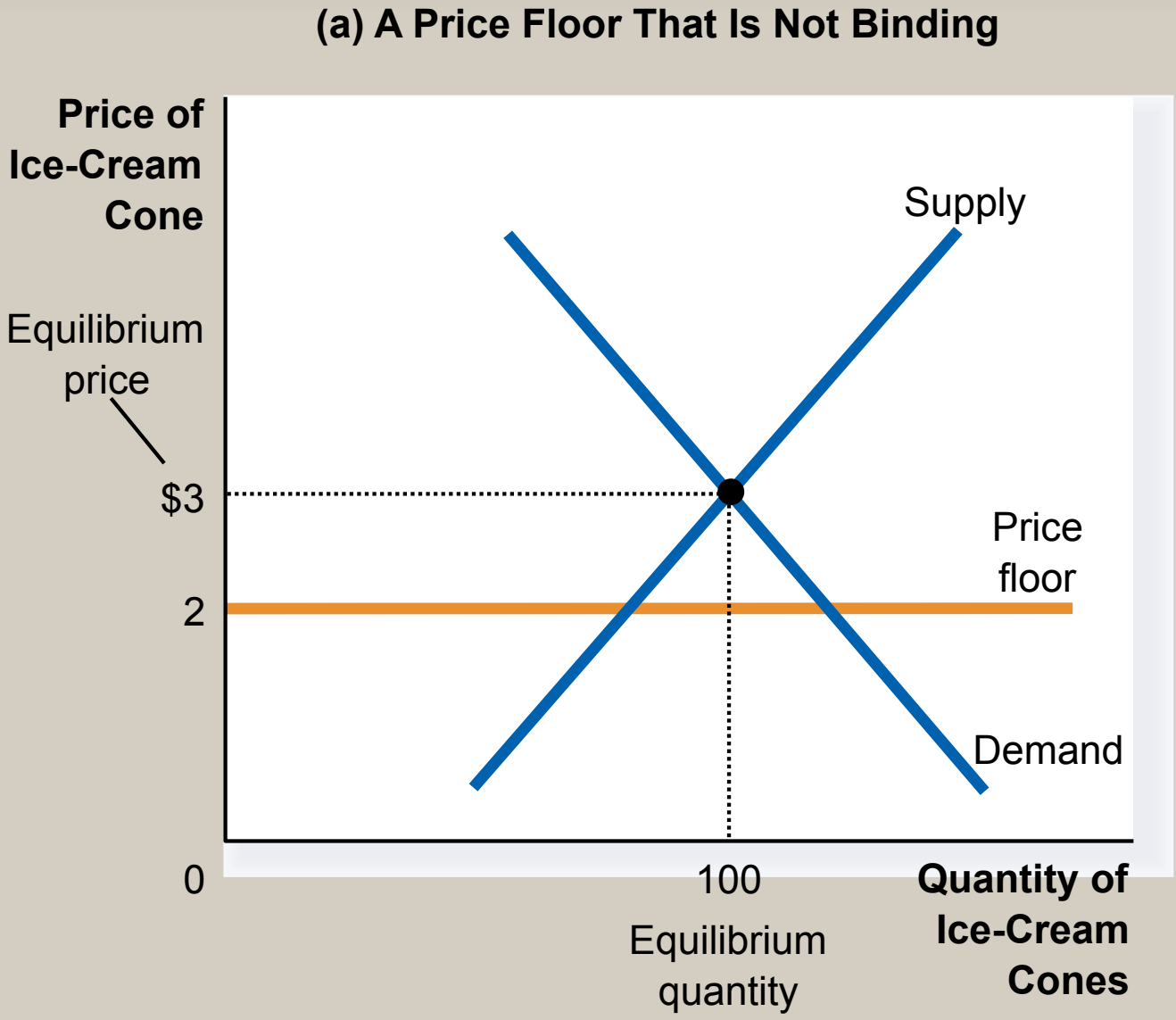


How Price Floors Affect Market Outcomes

- When the government imposes a price floor, two outcomes are possible.
- The price floor *is not* binding if set *below* the equilibrium price.
- The price floor *is* binding if set *above* the equilibrium price, leading to a surplus.

Figure 4 A Market with a Price Floor



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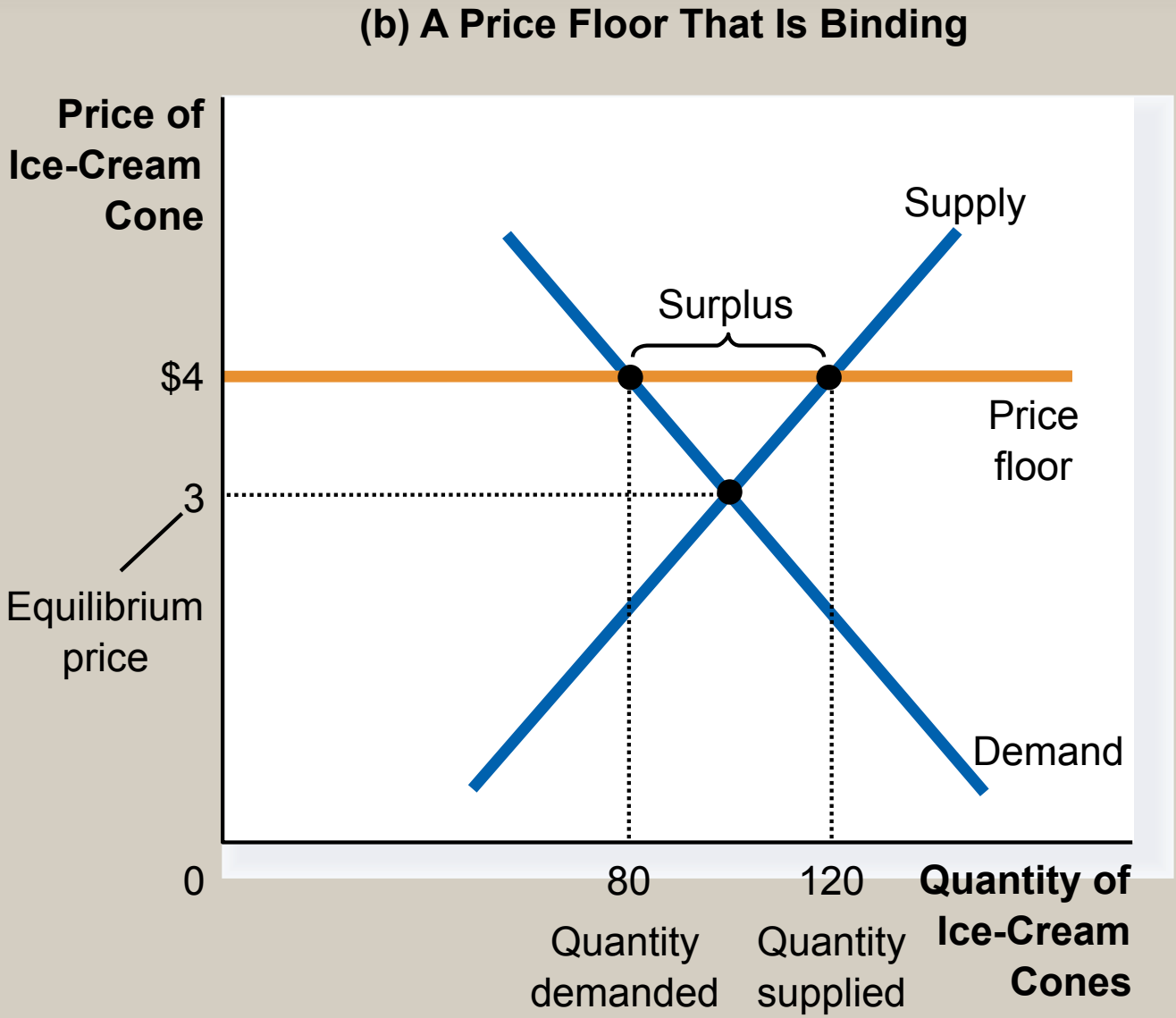


How Price Floors Affect Market Outcomes

- A price floor prevents supply and demand from moving toward the equilibrium price and quantity.
- When the market price hits the floor, it can fall no further, and the market price equals the floor price.

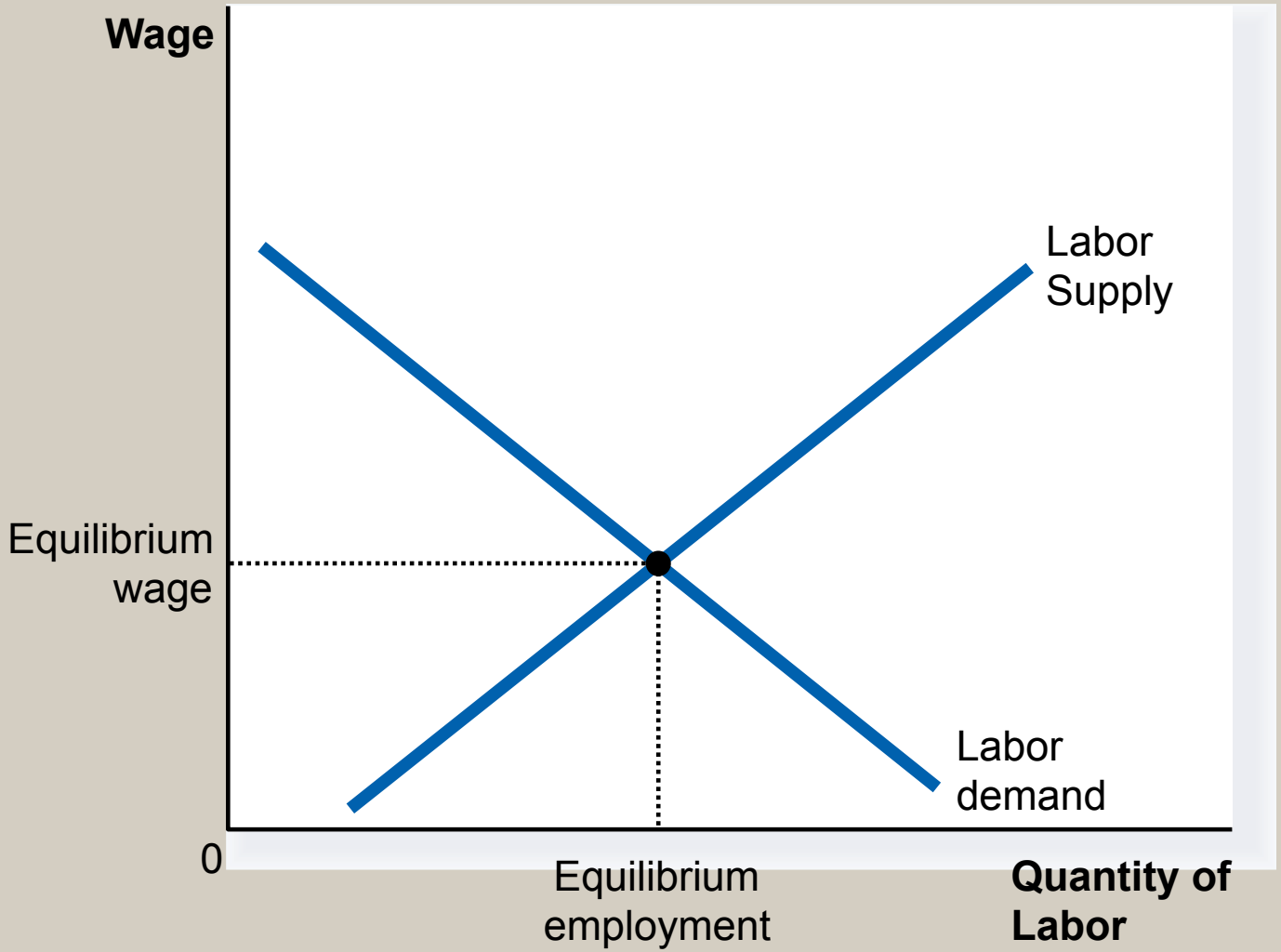
How Price Floors Affect Market Outcomes

- A binding price floor causes . . .
  - a surplus because $Q_S > Q_D$.
  - *nonprice rationing* is an alternative mechanism for rationing the good, using discrimination criteria.
    - Examples: The minimum wage, agricultural price supports

The Minimum Wage

- An important example of a price floor is the minimum wage. Minimum wage laws dictate the lowest price possible for labor that any employer may pay.

Figure 5 How the Minimum Wage Affects the Labor Market



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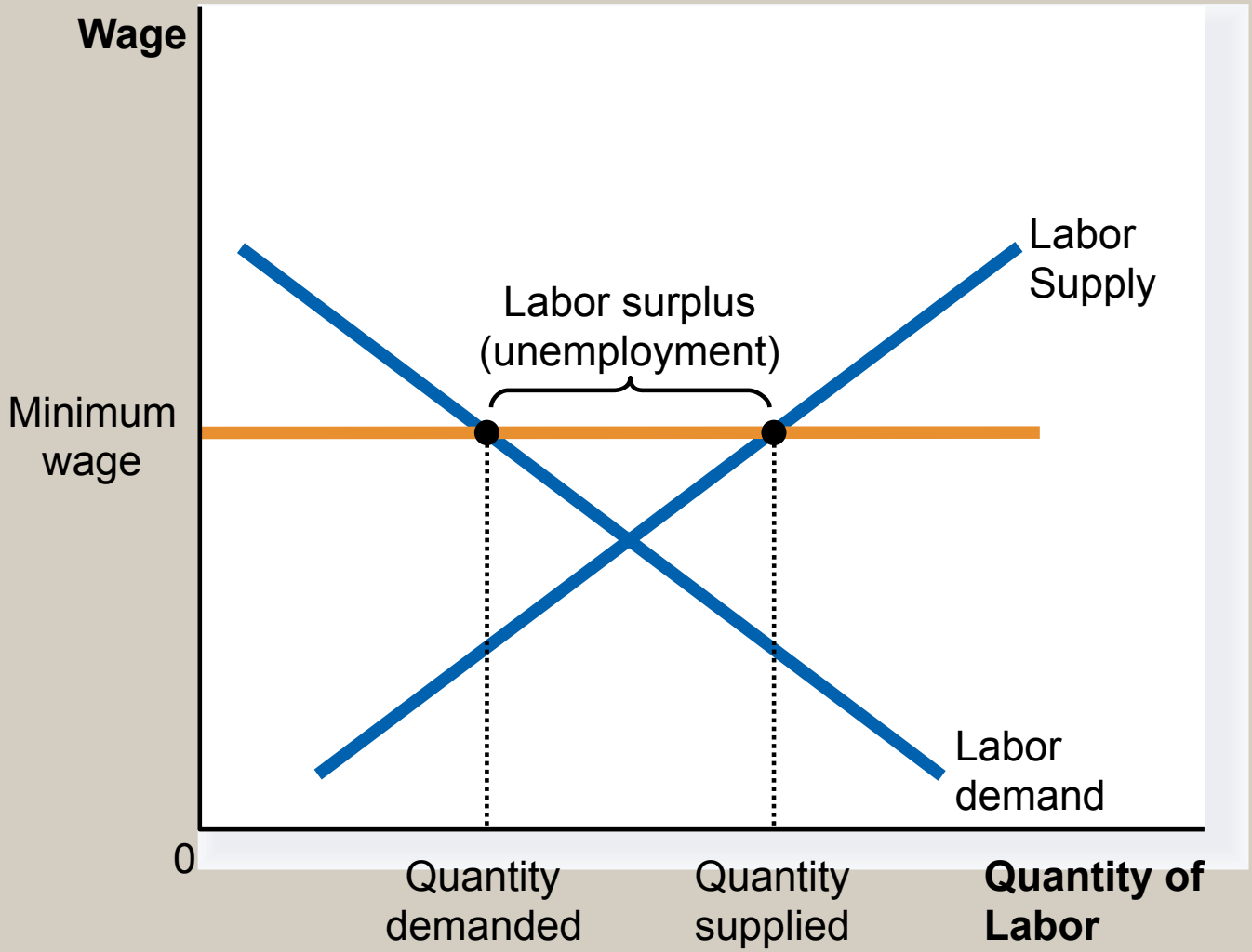
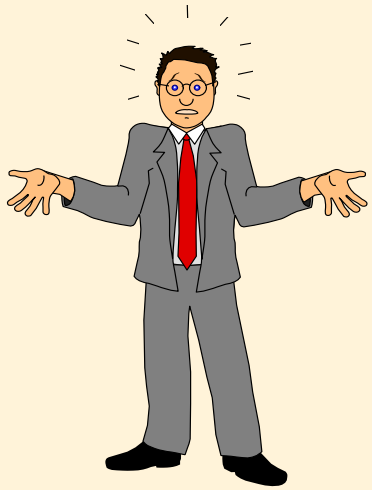


TAXES

- Governments levy taxes to raise revenue for public projects.

How Taxes on Buyers (and Sellers) Affect Market Outcomes

- Taxes discourage market activity.
- When a good is taxed, the quantity sold is smaller.
- Buyers and sellers share the tax burden.



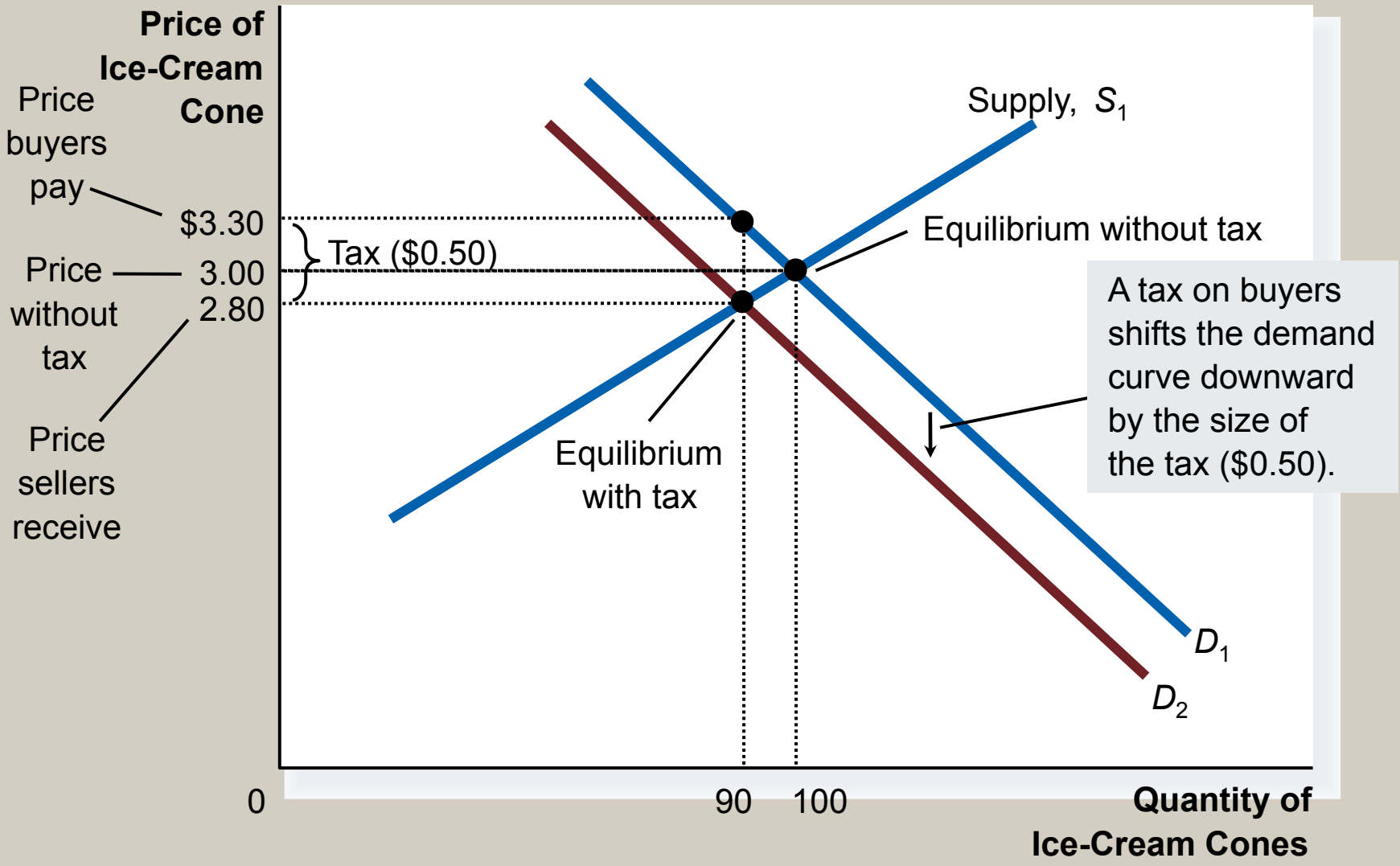
Elasticity and Tax Incidence

- *Tax incidence* is the manner in which the burden of a tax is shared among participants in a market.

Elasticity and Tax Incidence

- Tax incidence is the study of who bears the burden of a tax.
- Taxes result in a change in market equilibrium.
- Buyers pay more and sellers receive less, regardless of whom the tax is levied on.

Figure 6 A Tax on Buyers



Elasticity and Tax Incidence

- What was the impact of tax?
  - Taxes discourage market activity.
  - When a good is taxed, the quantity sold is smaller.
  - Buyers and sellers share the tax burd

Figure 7 A Tax on Sellers

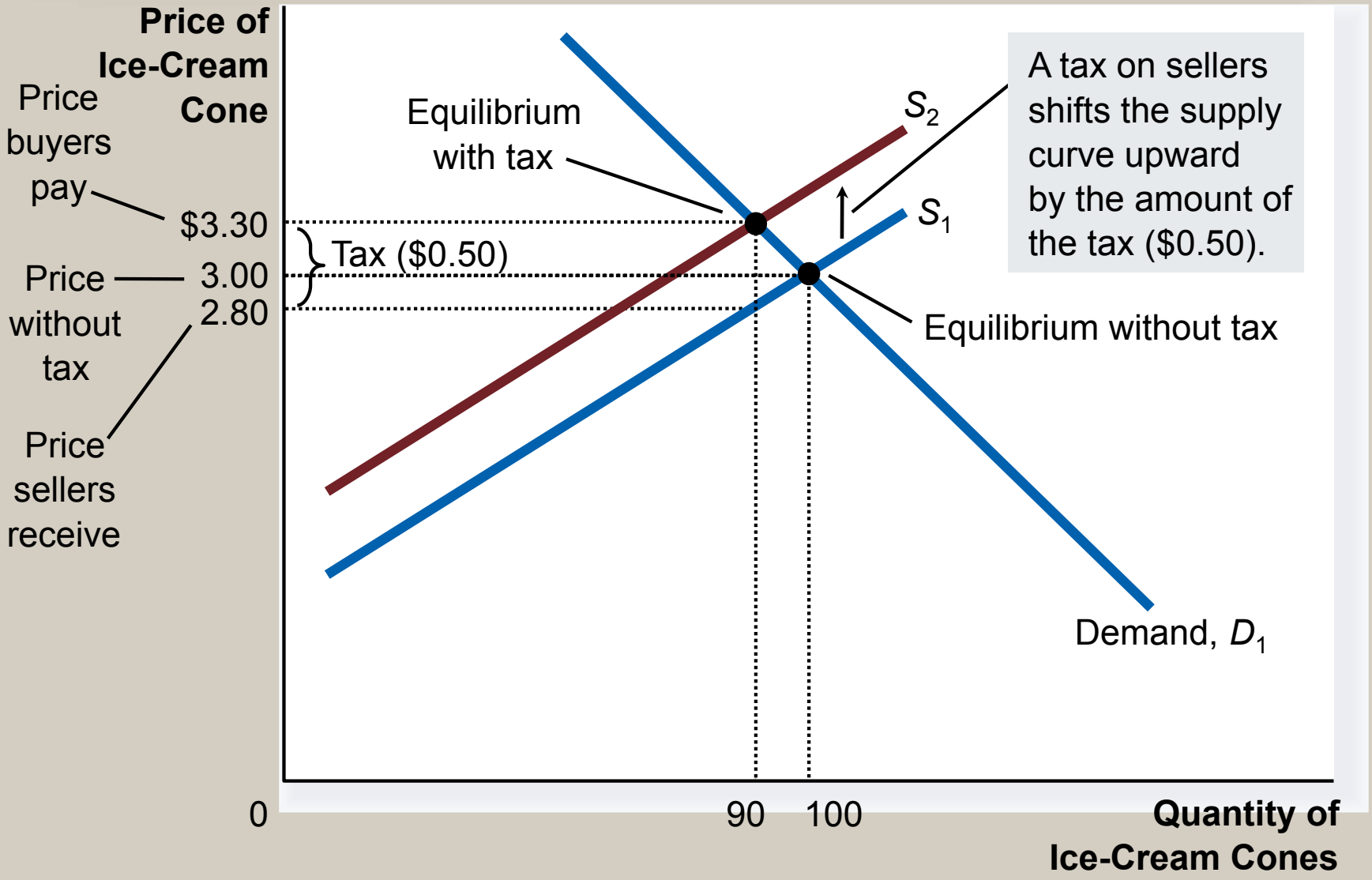
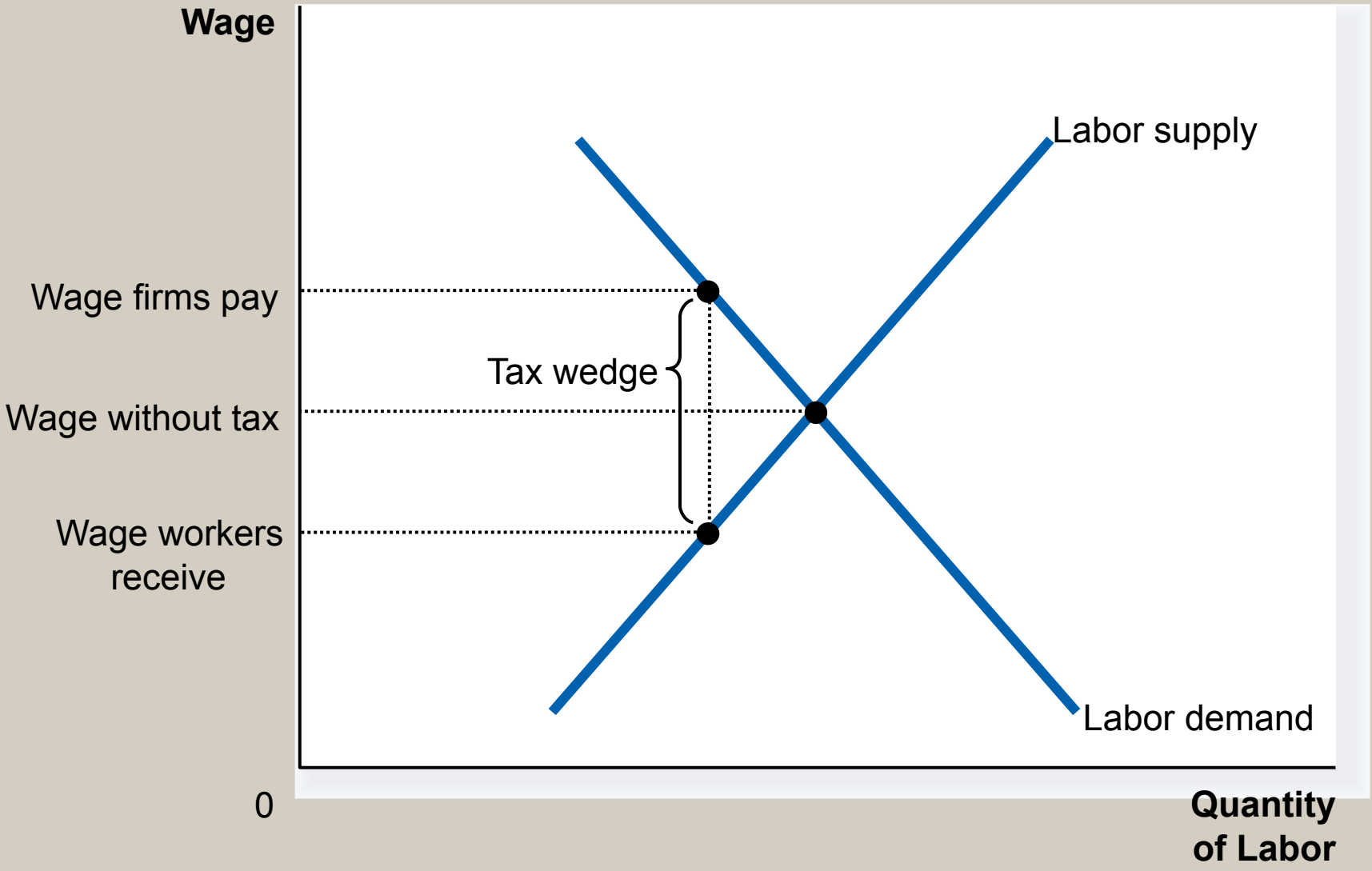


Figure 8 A Payroll Tax



Elasticity and Tax Incidence

- In what proportions is the burden of the tax divided?
- How do the effects of taxes on sellers compare to those levied on buyers?
- The answers to these questions depend on the elasticity of demand and the elasticity of supply.

Figure 9 How the Burden of a Tax Is Divided

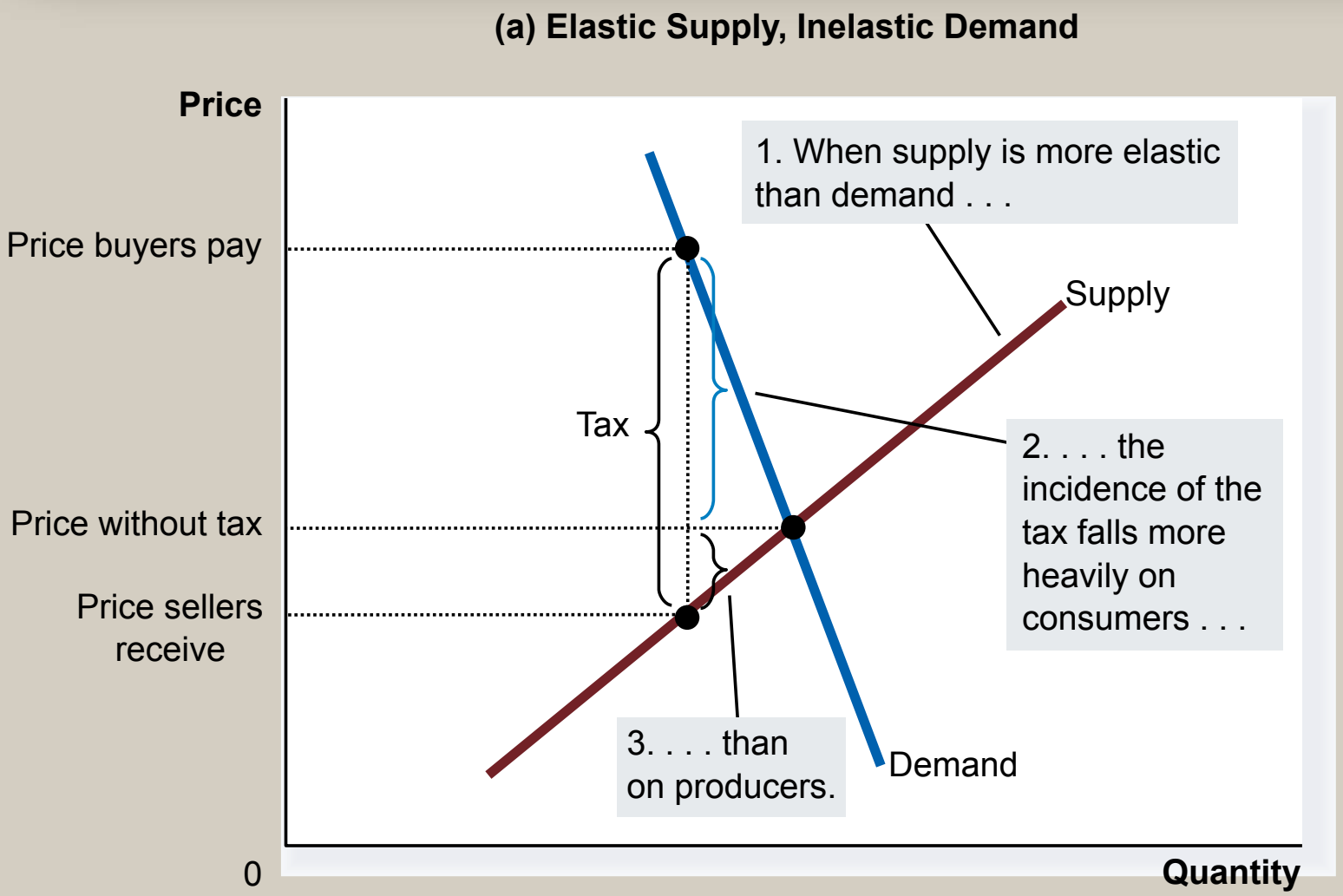
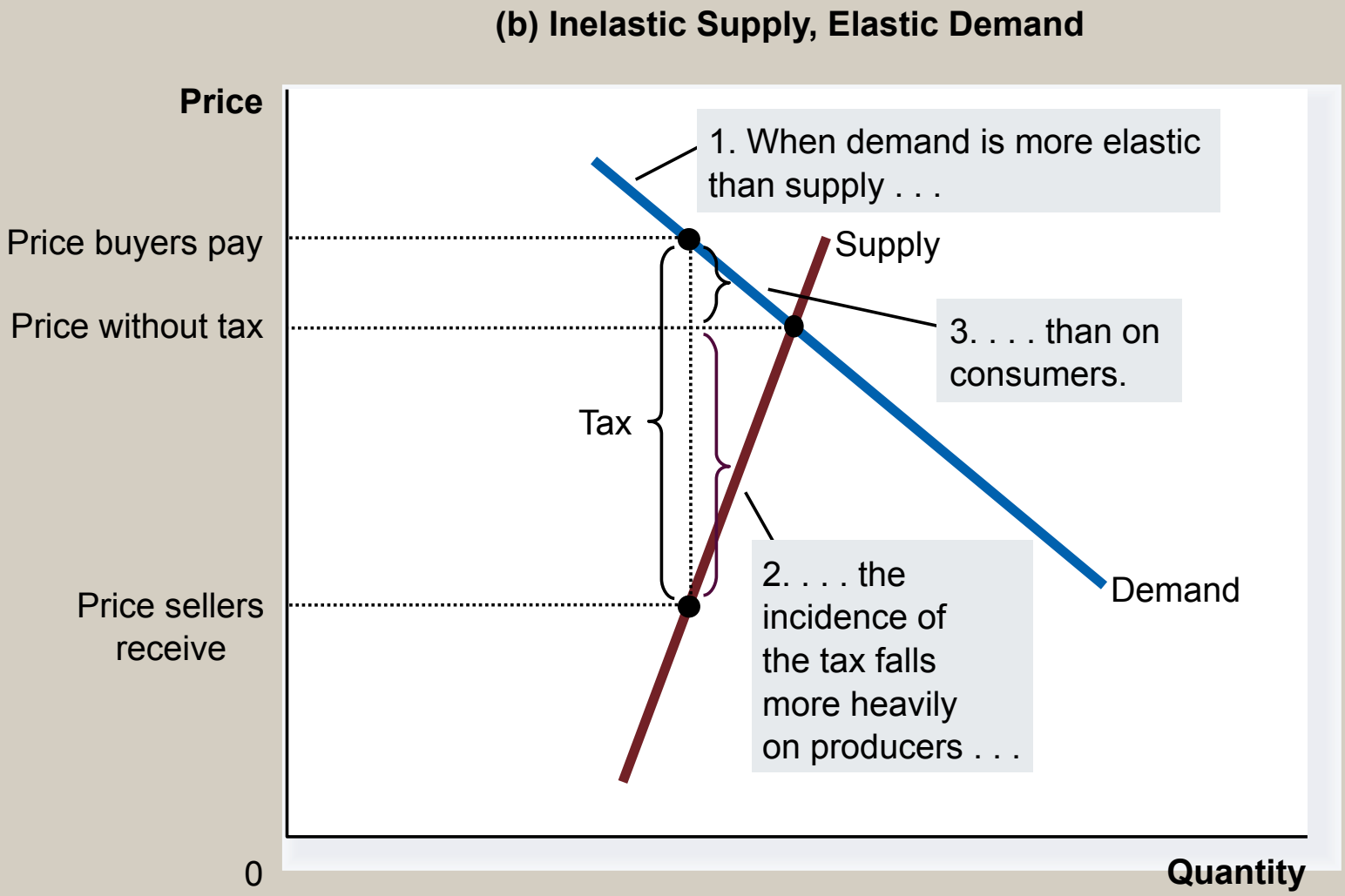
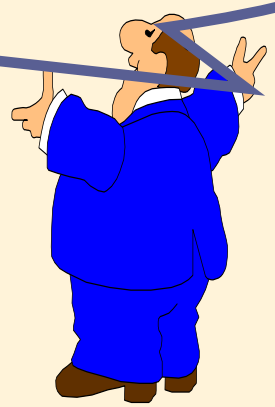


Figure 9 How the Burden of a Tax Is Divided



ELASTICITY AND TAX INCIDENCE

So, how is the burden of the tax divided?



- The burden of a tax falls more heavily on the side of the market that is less elastic.

Summary

- Price controls include price ceilings and price floors.
- A price ceiling is a legal maximum on the price of a good or service. An example is rent control.
- A price floor is a legal minimum on the price of a good or a service. An example is the minimum wage.

Summary

- Taxes are used to raise revenue for public purposes.
- When the government levies a tax on a good, the equilibrium quantity of the good falls.
- A tax on a good places a wedge between the price paid by buyers and the price received by sellers.

Summary

- The incidence of a tax refers to who bears the burden of a tax.
- The incidence of a tax does not depend on whether the tax is levied on buyers or sellers.
- The incidence of the tax depends on the price elasticities of supply and demand.
- The burden tends to fall on the side of the market that is less elastic.