Elasticity and Its Applications

Elasticity . . .

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

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

THE ELASTICITY OF DEMAND

- **Price elasticity of demand** is a measure of how much the quantity demanded of a good responds to a change in the price of that good.

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

- Availability of Close Substitutes
- Necessities versus Luxuries
- Definition of the Market
- Time Horizon

- Demand tends to be more elastic :
  - the larger the number of close substitutes.
  - if the good is a luxury.
  - the more narrowly defined the market.
  - the longer the time period.

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

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

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- Example: If the price of a cup of coffee increases from $2.00 to $2.20 and the amount you buy falls from 10 to 8 cups (per week), then your elasticity of demand would be calculated as:

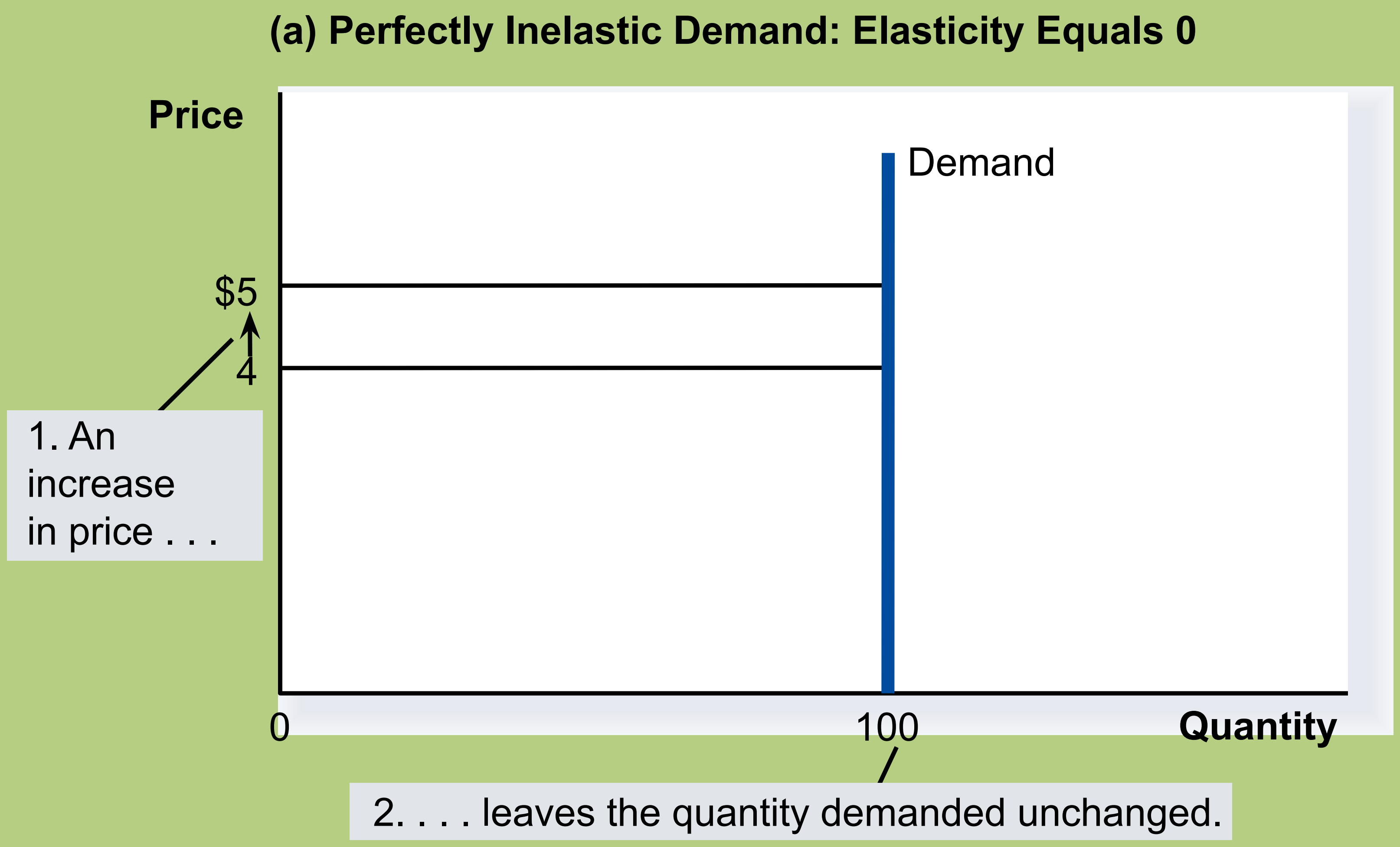
$$\frac{\frac{(10-8)}{10} \times 100}{\frac{(2.20-2.00)}{2.00} \times 100} = \frac{20\%}{10\%} = 2$$

- Inelastic Demand
  - Quantity demanded does not respond strongly to price changes.
  - Price elasticity of demand is less than one.
- Elastic Demand
  - Quantity demanded responds strongly to changes in price.
  - Price elasticity of demand is greater than one.

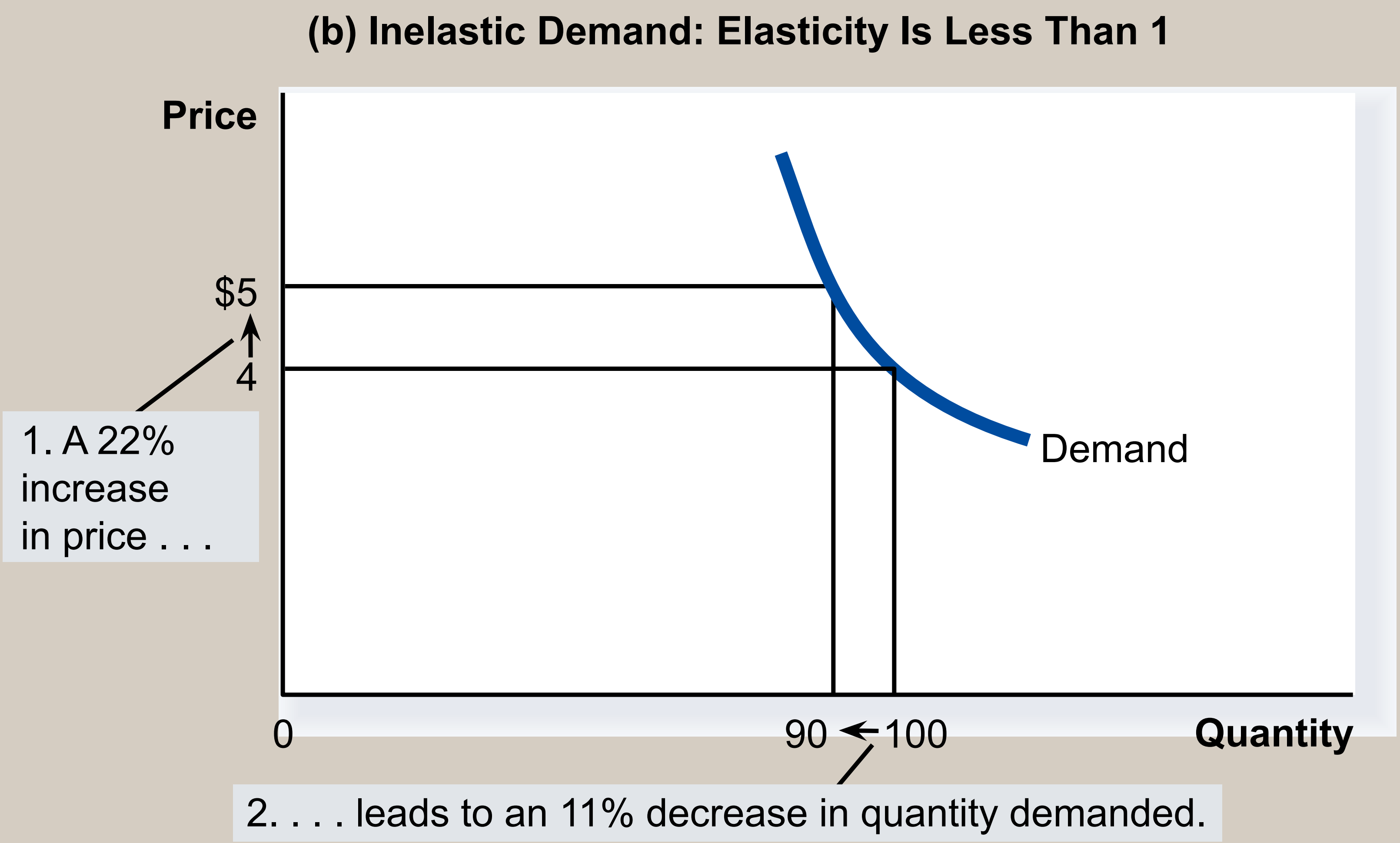
- Perfectly Inelastic
  - Quantity demanded does not respond to price changes.
- Perfectly Elastic
  - Quantity demanded changes infinitely with any change in price.
- Unit Elastic
  - Quantity demanded changes by the same percentage as the price.

- 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.

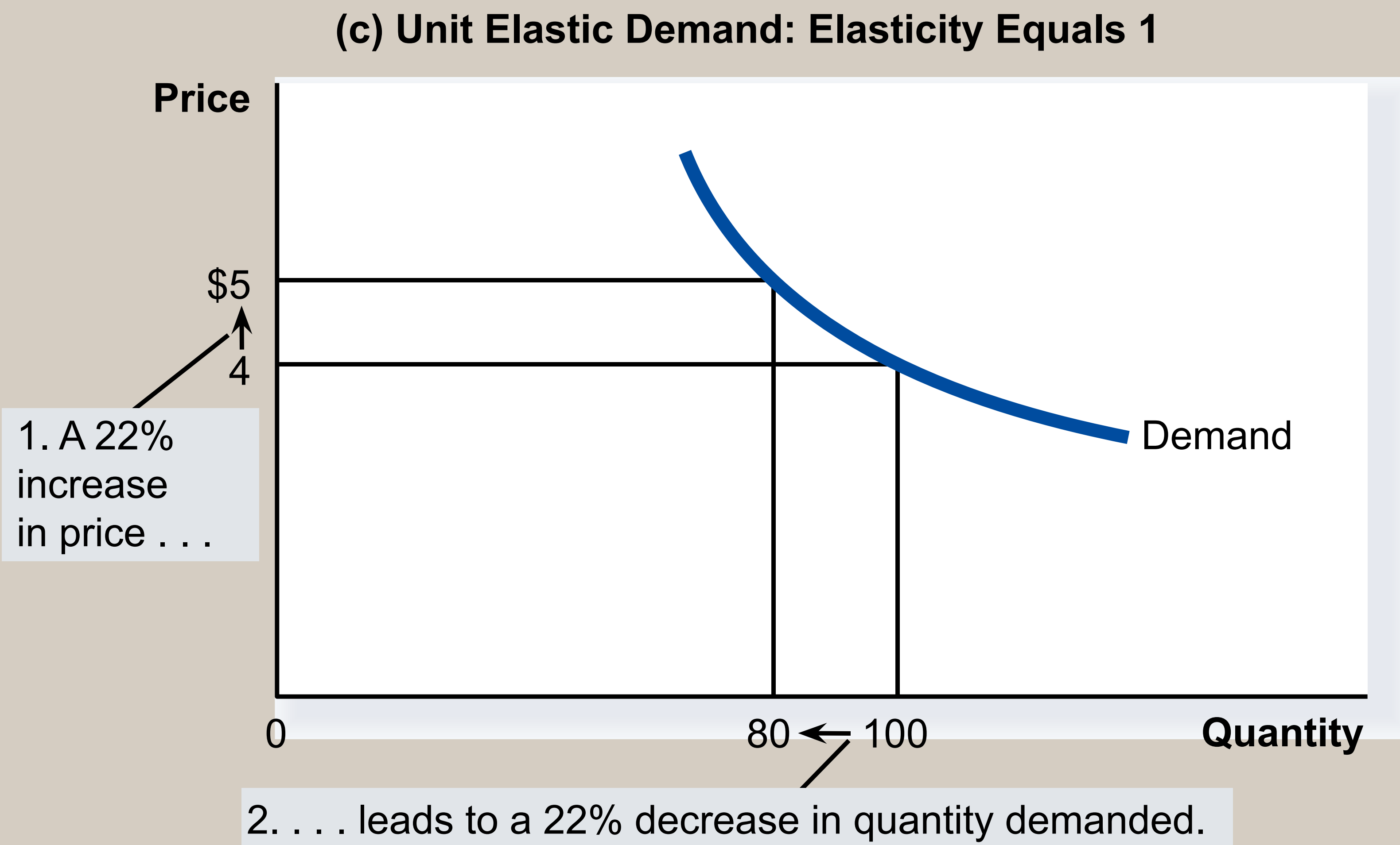
The Price Elasticity of Demand



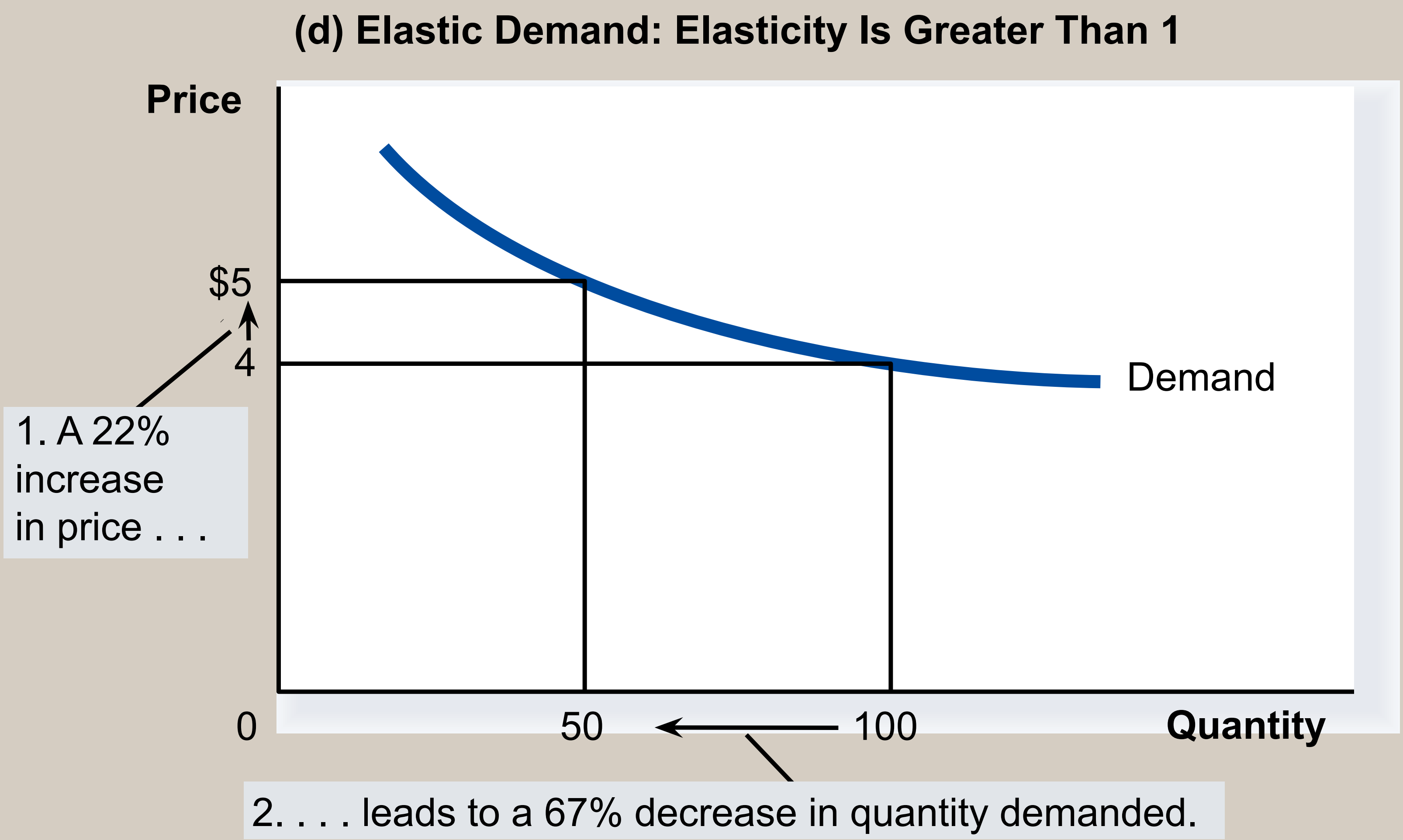
The Price Elasticity of Demand



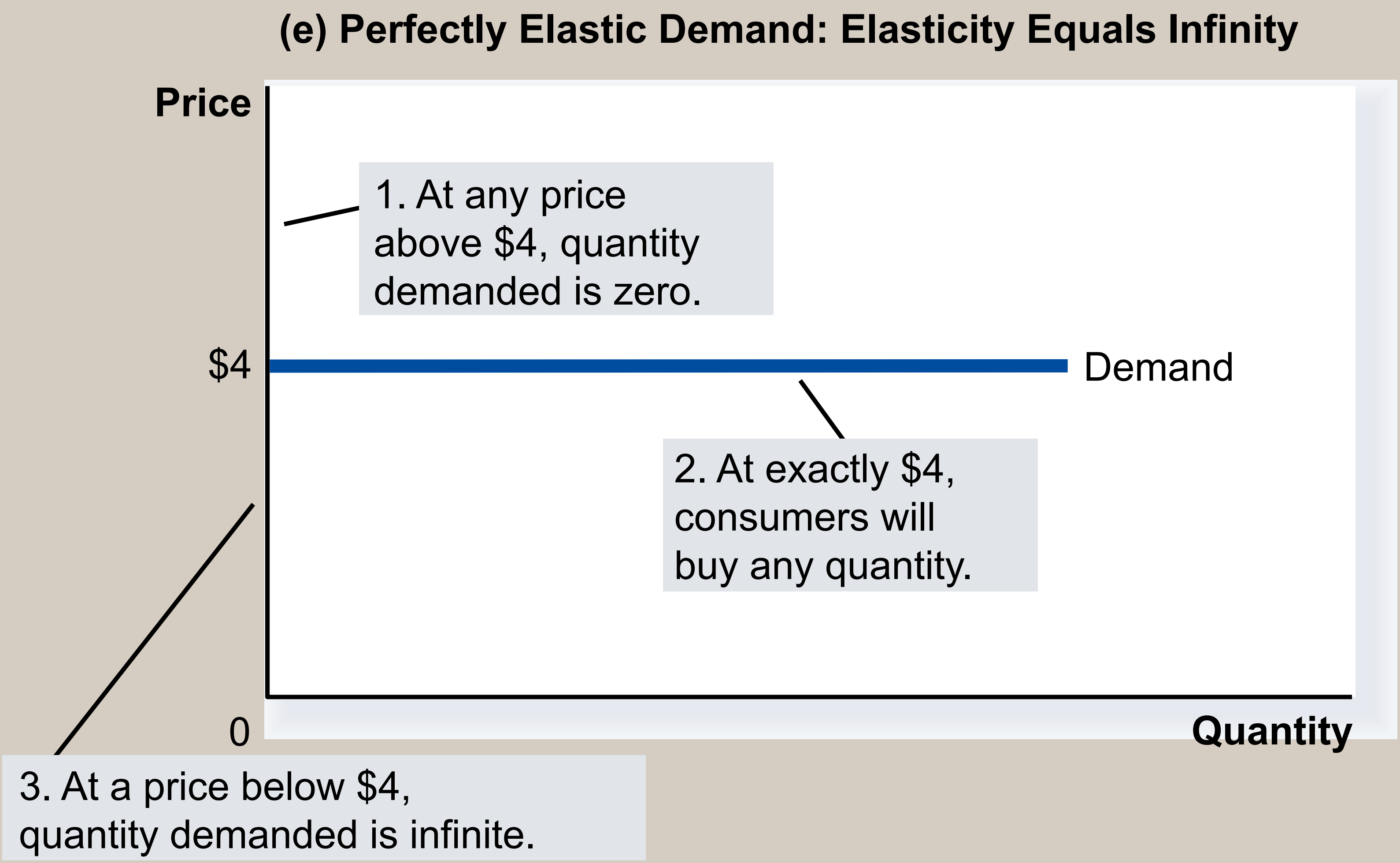
The Price Elasticity of Demand



The Price Elasticity of Demand



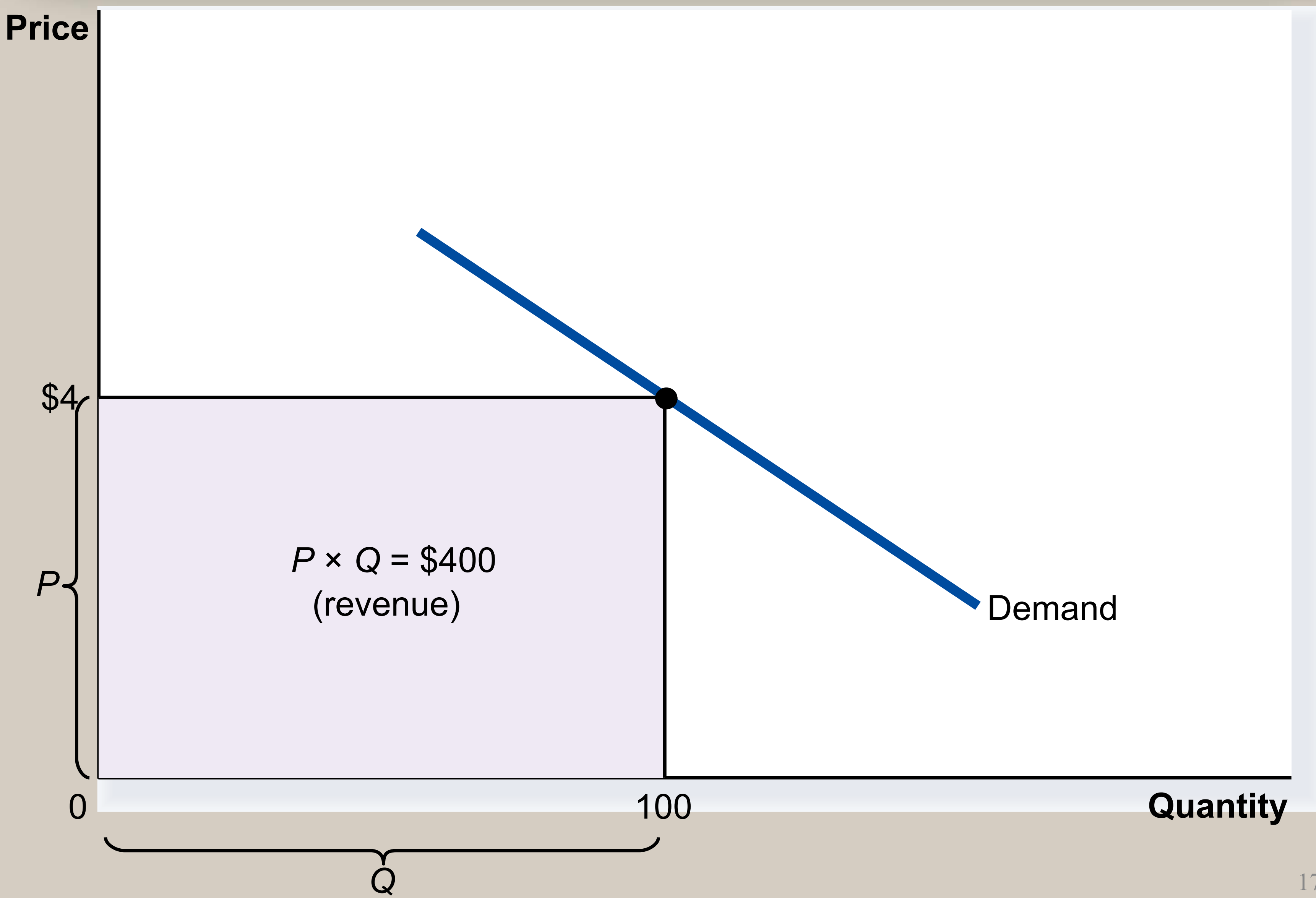
The Price Elasticity of Demand



- ***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.

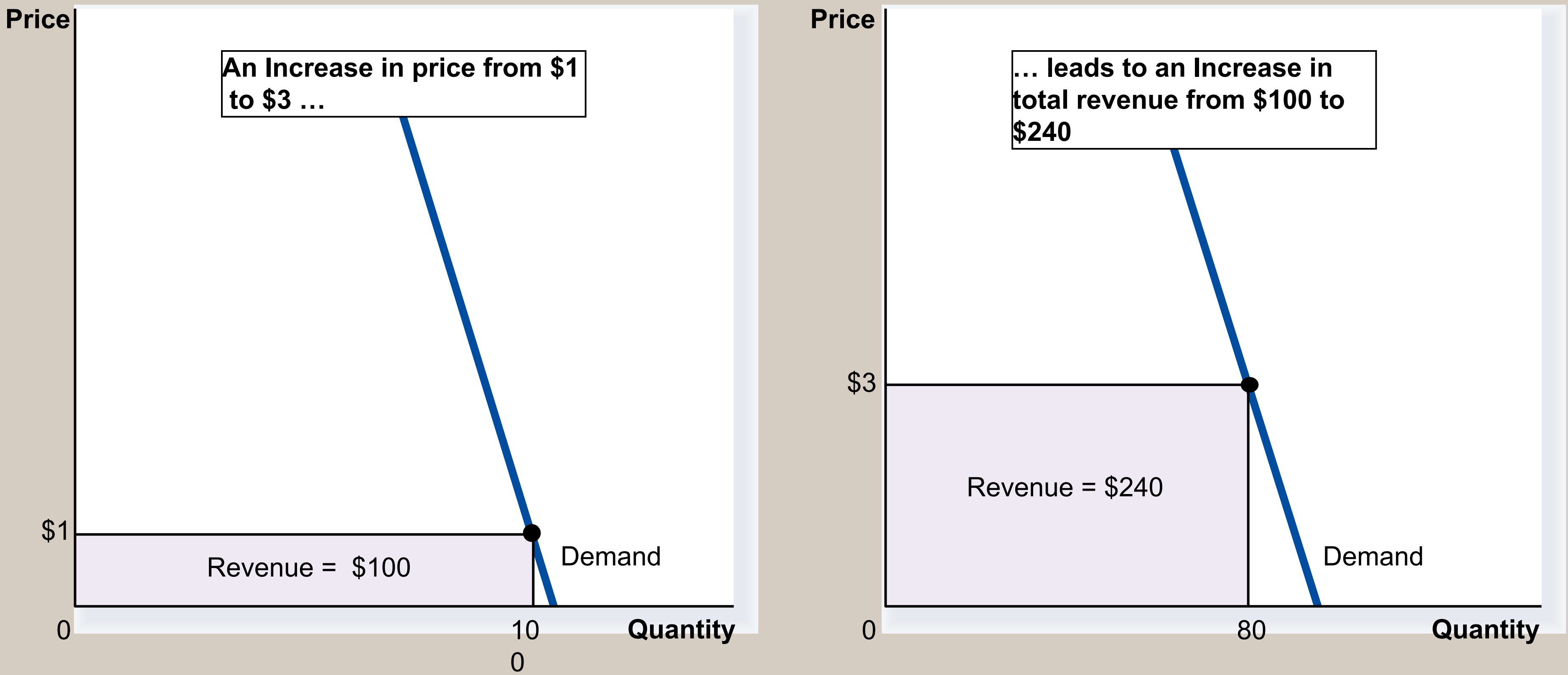
$$TR = P \times Q$$

Total Revenue



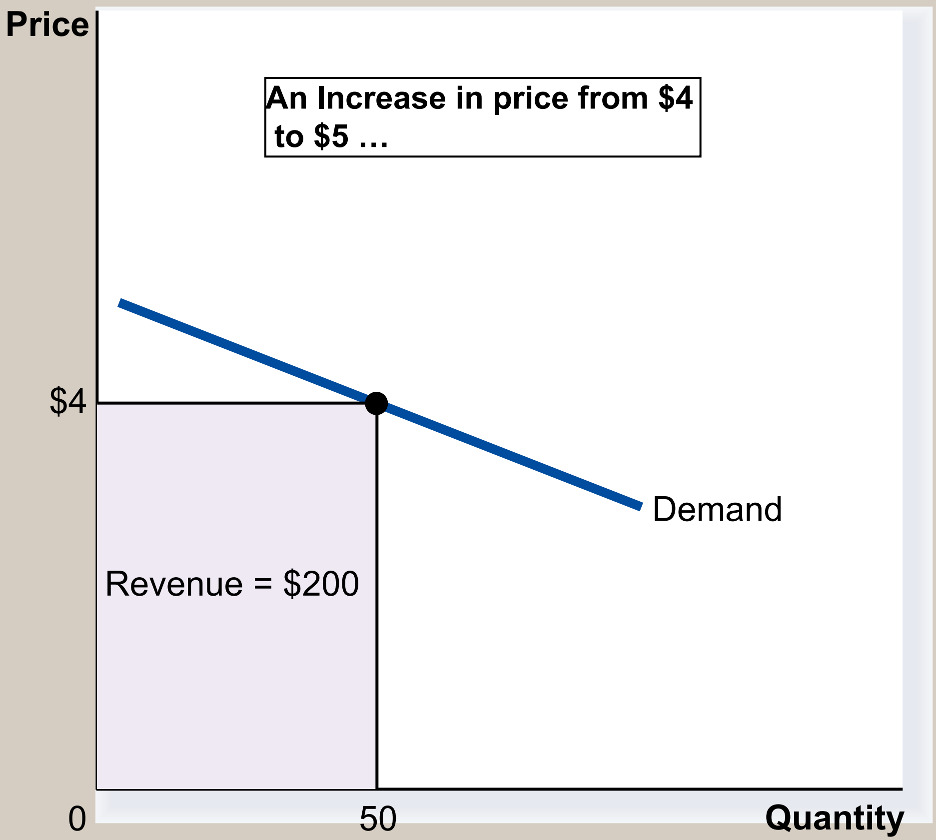
- With an inelastic demand curve, an increase in price leads to a decrease in quantity that is proportionately smaller. Thus, *total revenue increases.*

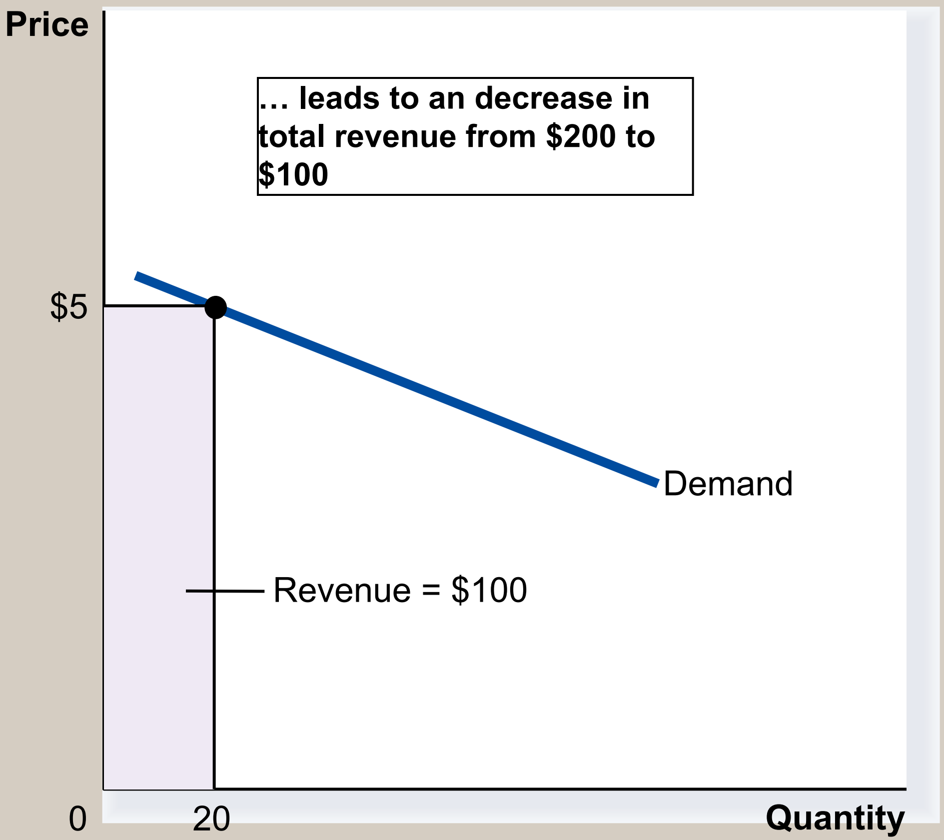
How Total Revenue Changes When Price Changes: Inelastic Demand



- 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.*

How Total Revenue Changes When Price Changes: Elastic 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.

$$\text{Income elasticity of demand} = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in income}}$$

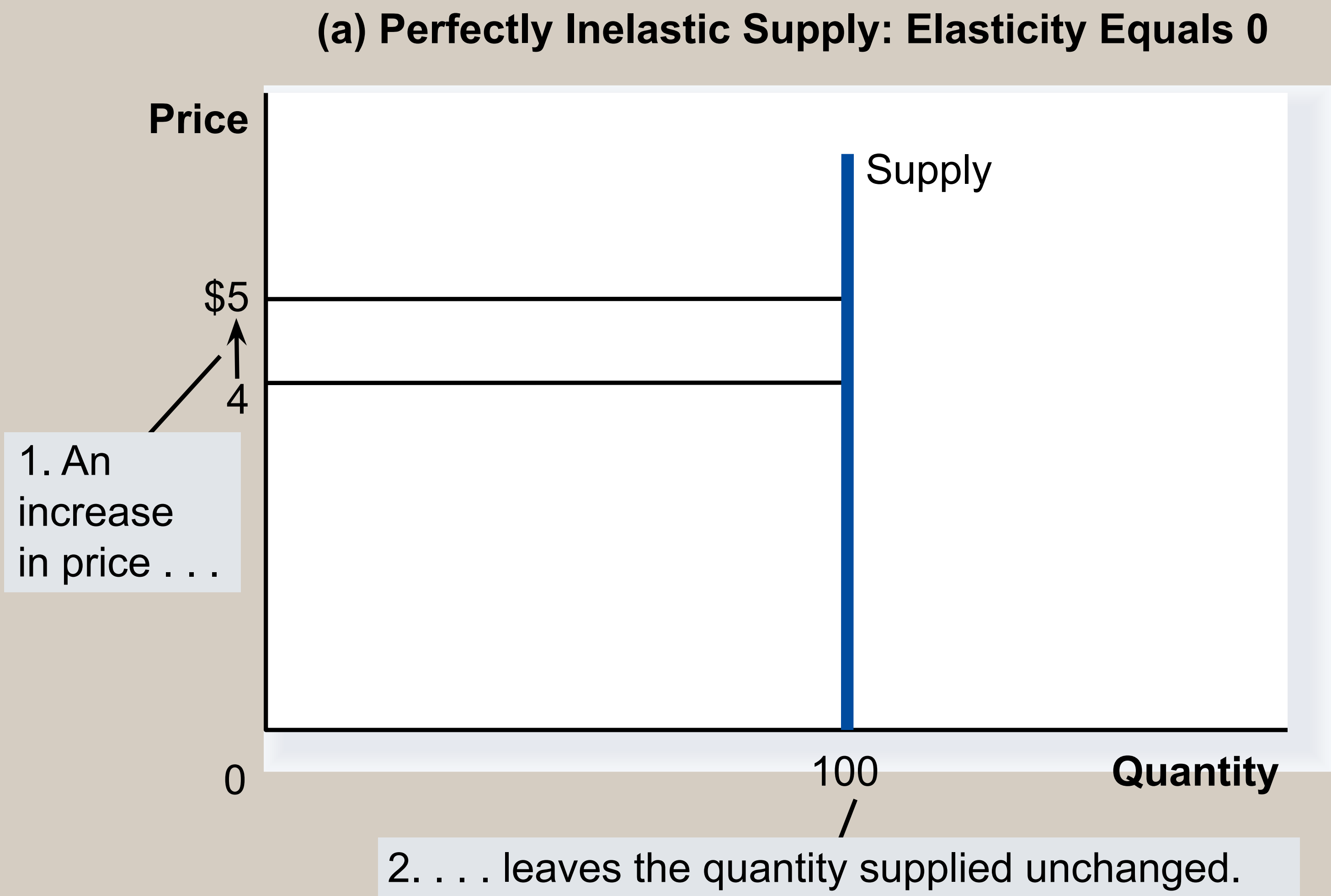
- Types of Goods
  - Normal Goods
  - Inferior Goods
- Higher income raises the quantity demanded for normal goods but lowers the quantity demanded for inferior goods.

- Goods consumers regard as necessities tend to be income inelastic
  - Examples include food, fuel, clothing, utilities, and medical services.
- Goods consumers regard as luxuries tend to be income elastic.
  - Examples include sports cars, furs, and expensive foods.

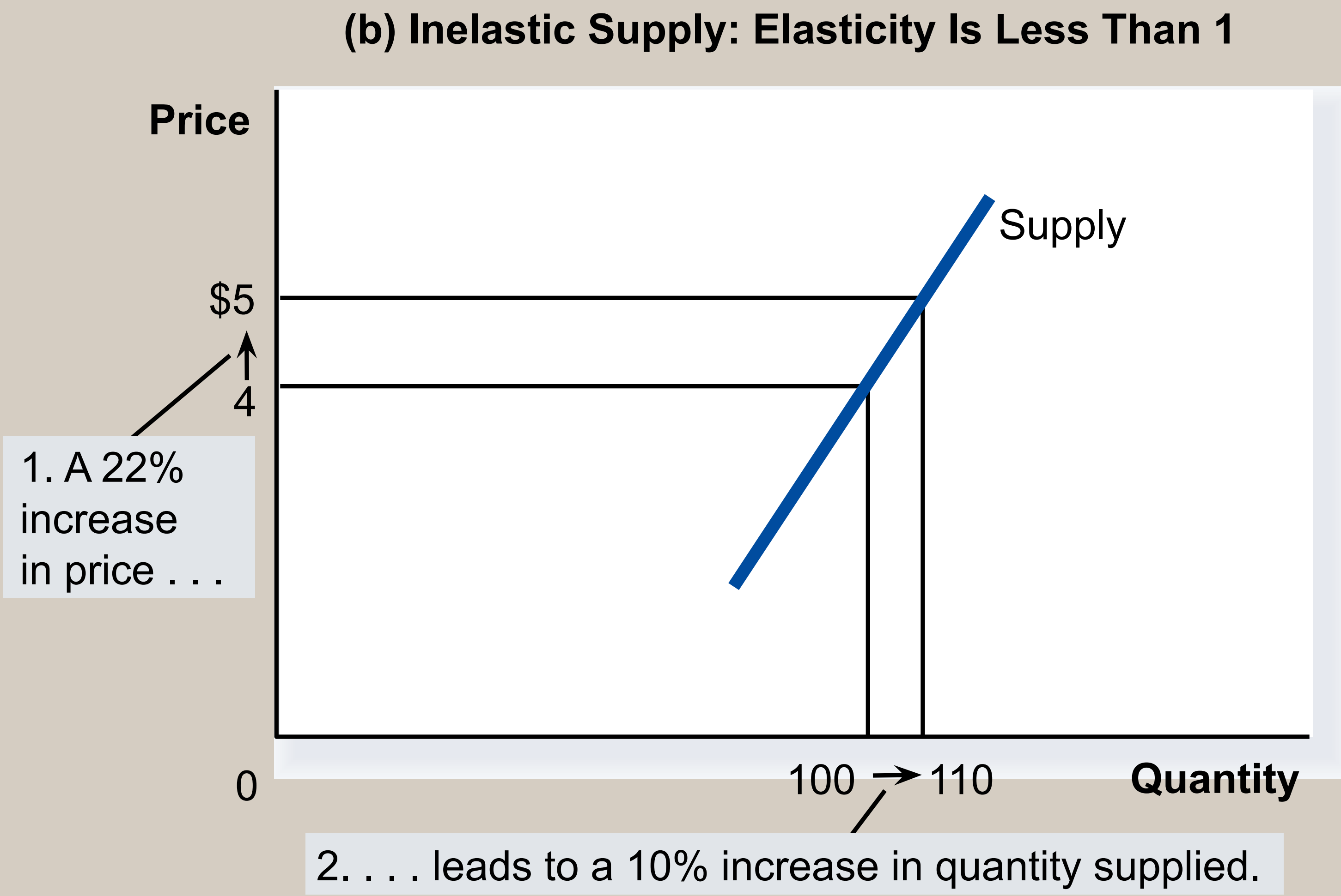
THE ELASTICITY OF SUPPLY

- ***Price elasticity of supply*** is a measure of how much the quantity supplied of a good responds to a change in the price of that good.
- Price elasticity of supply is the percentage change in quantity supplied resulting from a percent change in price.

The Price Elasticity of Supply

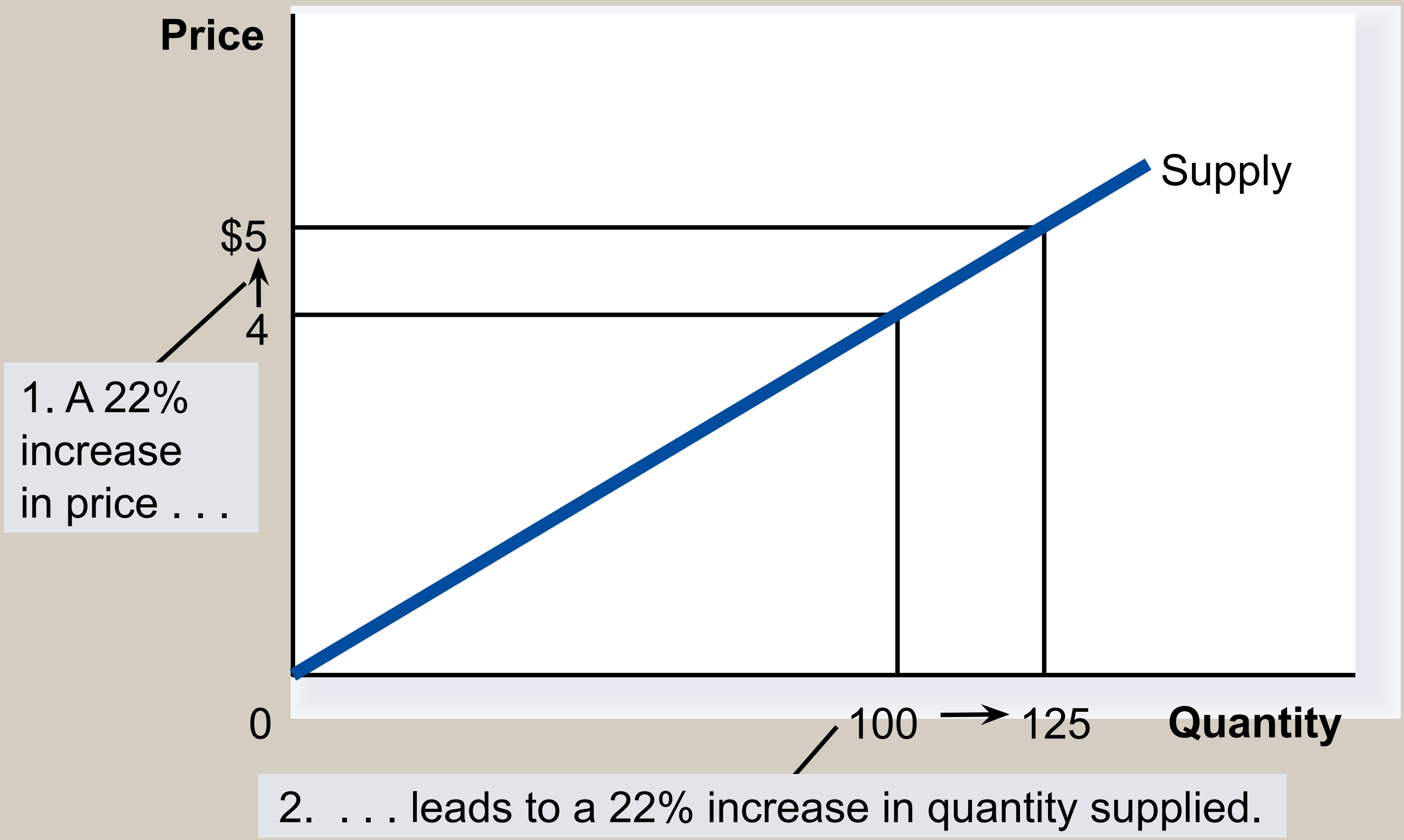


The Price Elasticity of Supply

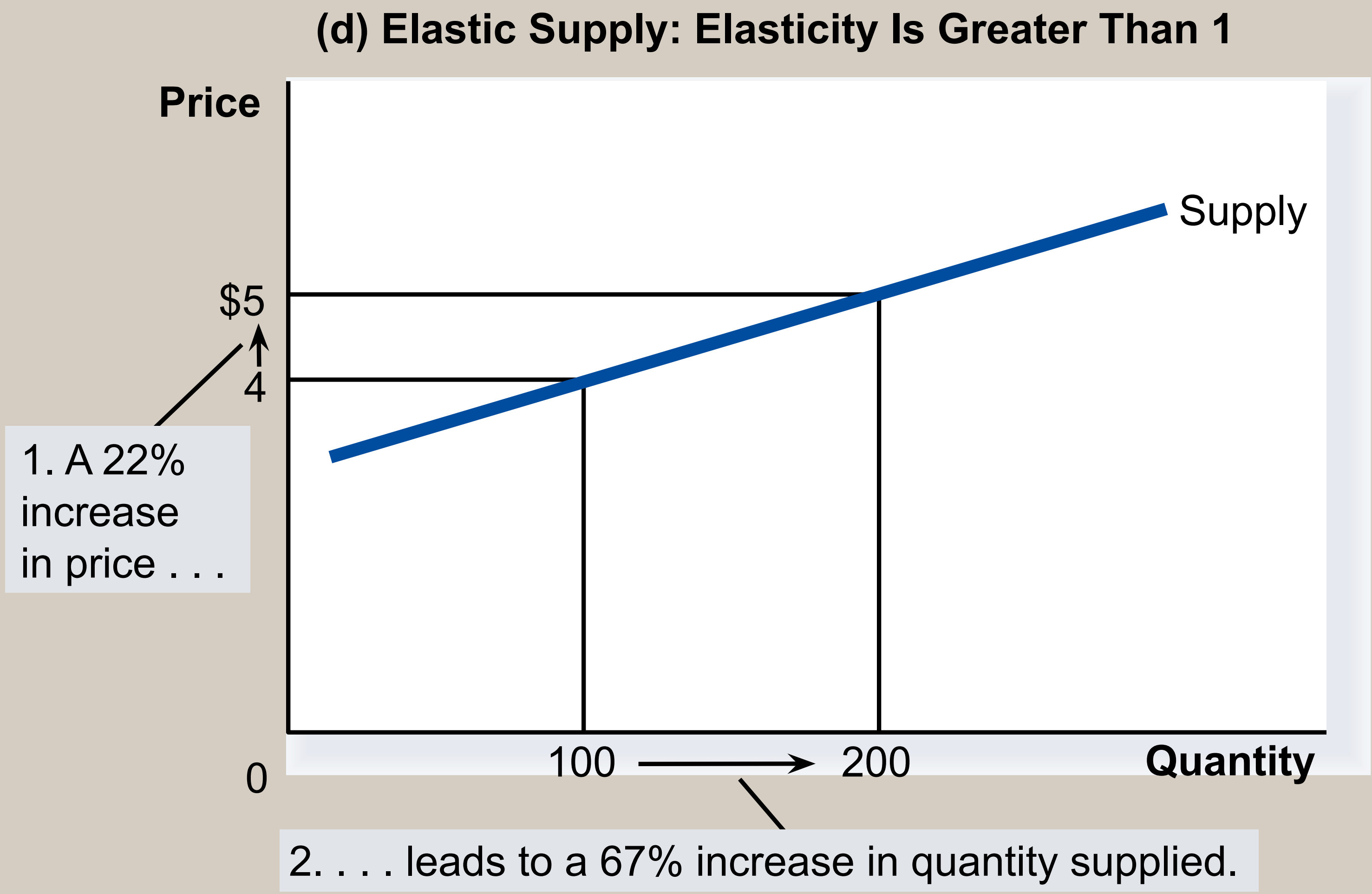


The Price Elasticity of Supply

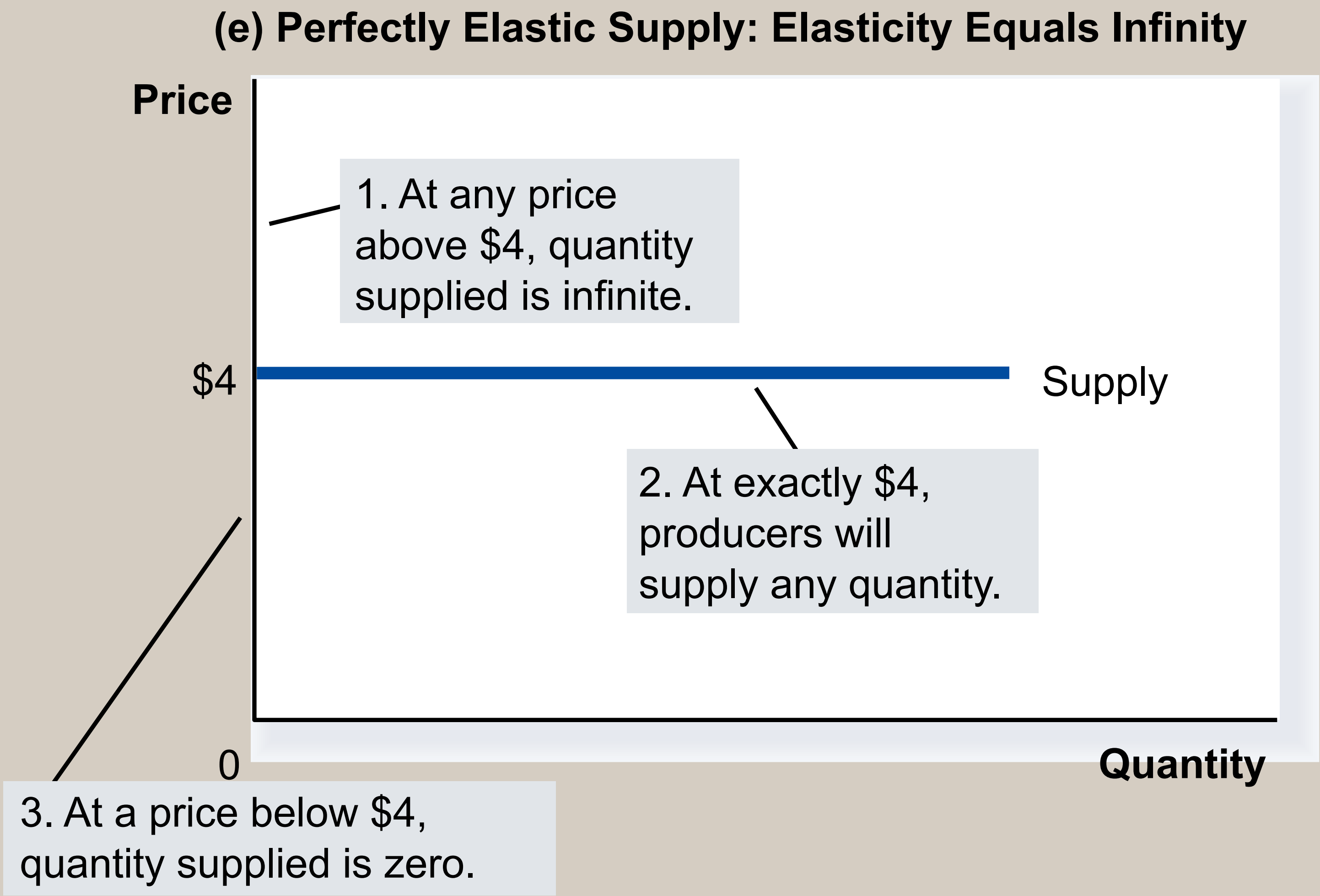
(c) Unit Elastic Supply: Elasticity Equals 1



The Price Elasticity of Supply



The Price Elasticity of Supply



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

- The price elasticity of supply is computed as the percentage change in the quantity supplied divided by the percentage change in price.

$$\text{Price elasticity of supply} = \frac{\begin{array}{c}\text{Percentage change}\\ \text{in quantity supplied}\end{array}}{\text{Percentage change in price}}$$

Summary

- Price elasticity of demand measures how much the quantity demanded responds to changes in the price.
- Price elasticity of demand is calculated as the percentage change in quantity demanded divided by the percentage change in price.
- If a demand curve is elastic, total revenue falls when the price rises.
- If it is inelastic, total revenue rises as the price rises.

Summary

- The income elasticity of demand measures how much the quantity demanded responds to changes in consumers' income.
- The price elasticity of supply measures how much the quantity supplied responds to changes in the price.

Summary

- In most markets, supply is more elastic in the long run than in the short run.
- The price elasticity of supply is calculated as the percentage change in quantity supplied divided by the percentage change in price.
- The tools of supply and demand can be applied in many different types of markets.