# MFP SET

Lecture 3

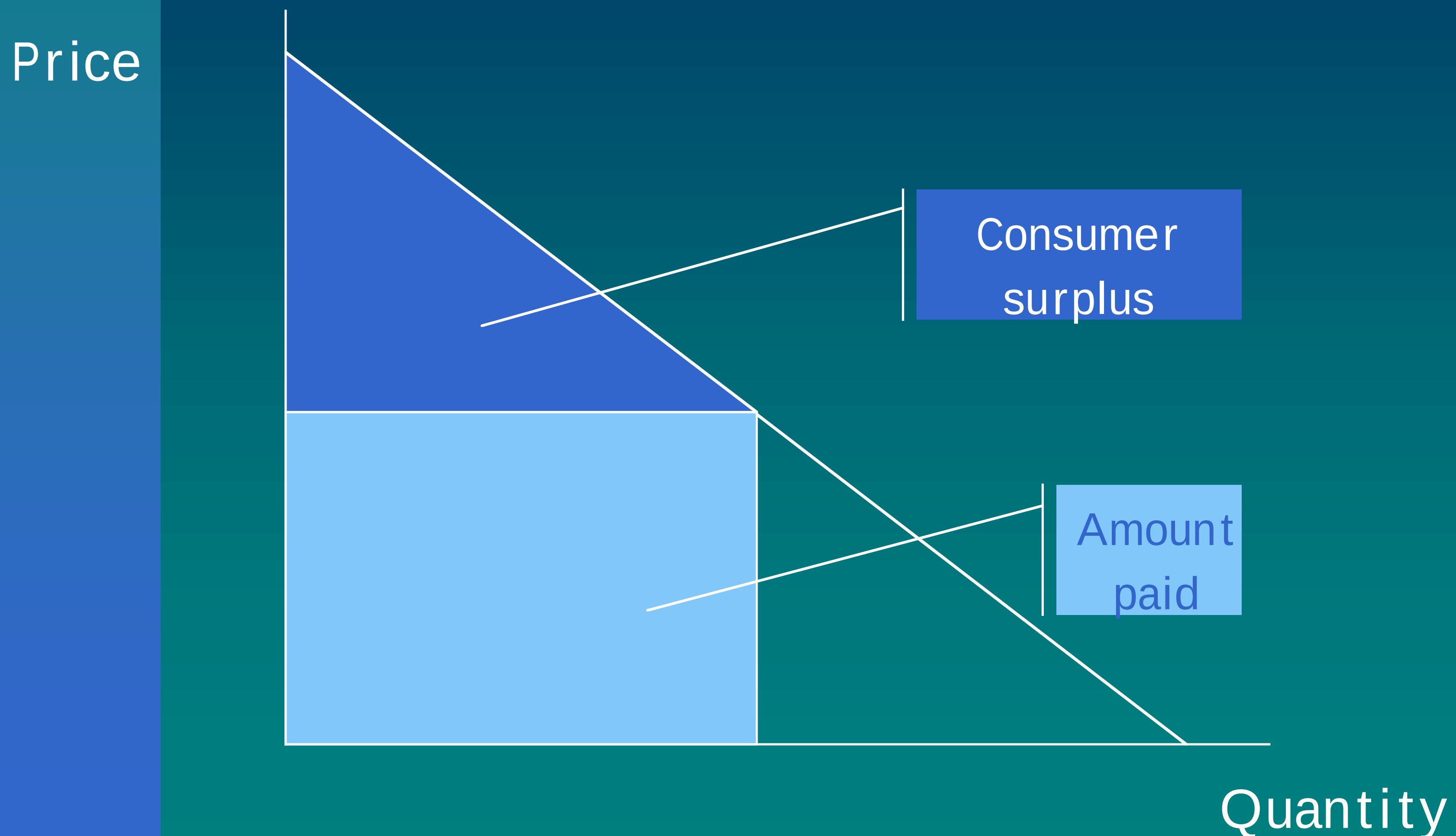
Surplus: Consumer & producer

Elasticity & its applications

# Consumer surplus

- *Willingness to pay*: the maximum amount that a consumer will pay for a good
- *Consumer surplus*: the difference between a consumer's willingness to pay and the amount the consumer actually pays

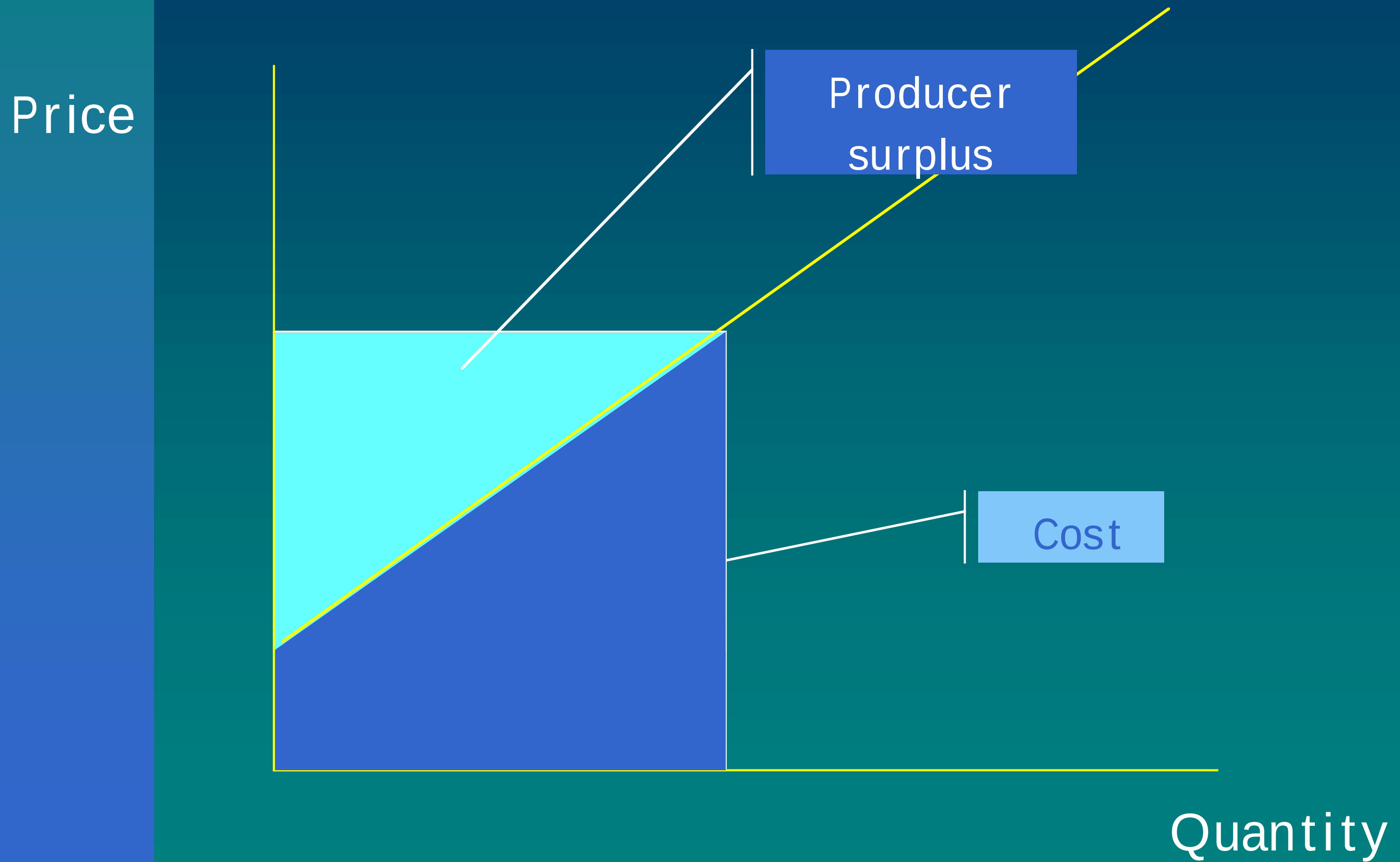
# Consumer surplus



# Producer surplus

- *Cost*: the value of everything a seller must give up (use) to produce a good
  - Remember opportunity cost
- *Producer surplus*: the amount seller is paid for a good minus the cost of the good

# Consumer surplus



# Elasticity . . .

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

. . . allows us to analyse supply and demand with greater precision

# Three Types of Elasticities

- Price elasticity of demand
- Income elasticity of demand
- Price elasticity of supply

# Price Elasticity of Demand

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

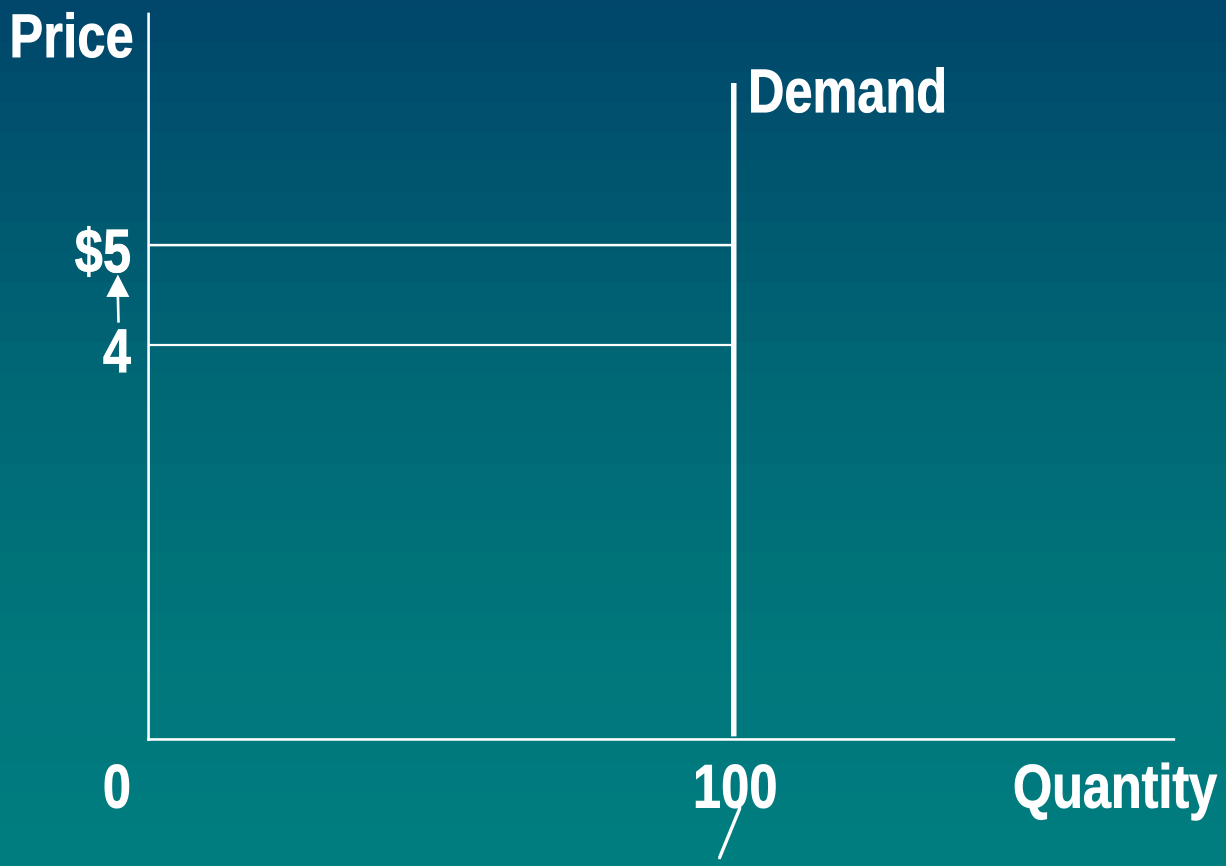
# Ranges of Elasticity

- Inelastic Demand
  - ➢ Quantity demanded does not respond strongly to price changes
- Elastic Demand
  - ➢ Quantity demanded responds strongly to changes in price.

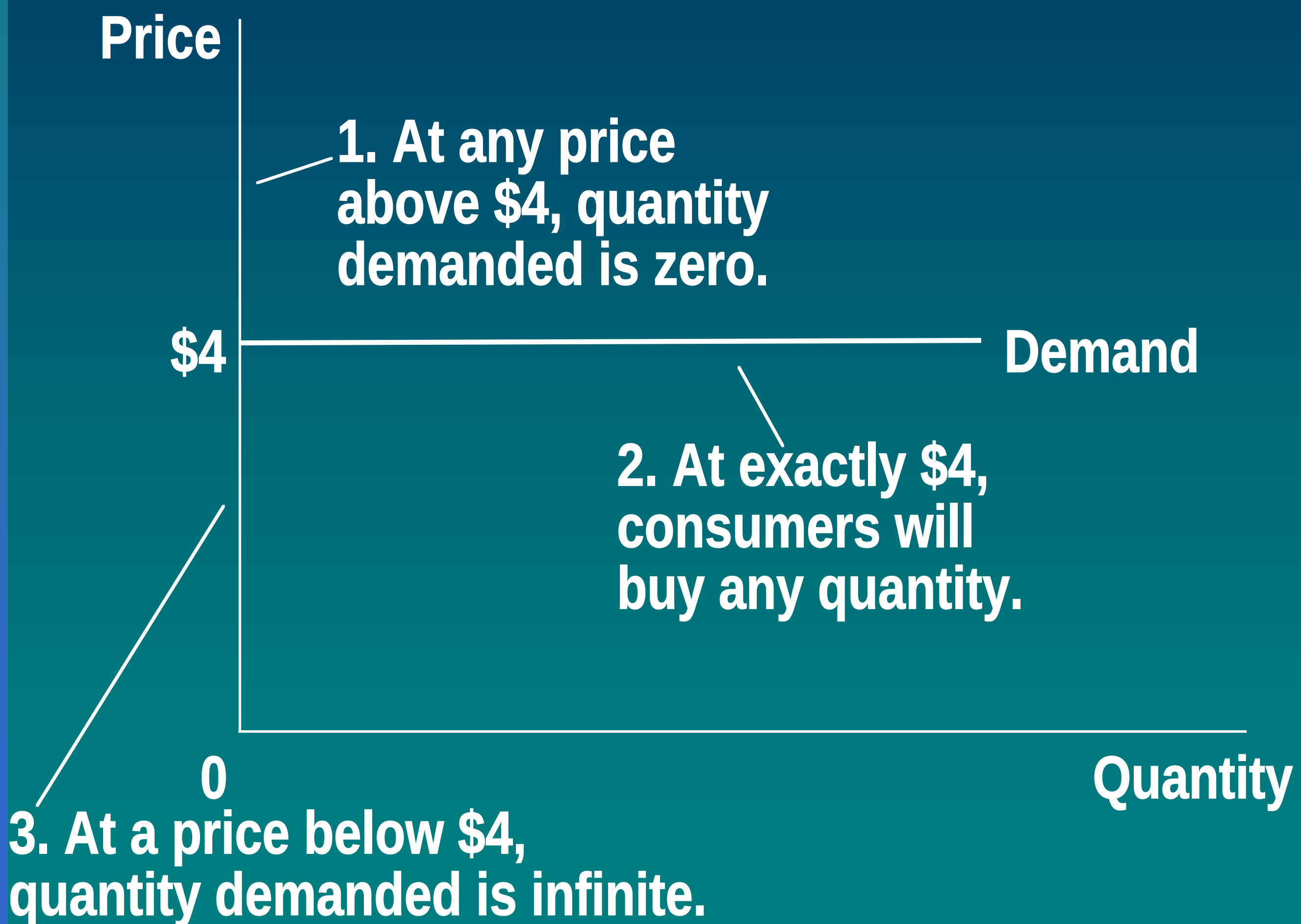
# Ranges of Elasticity

- 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

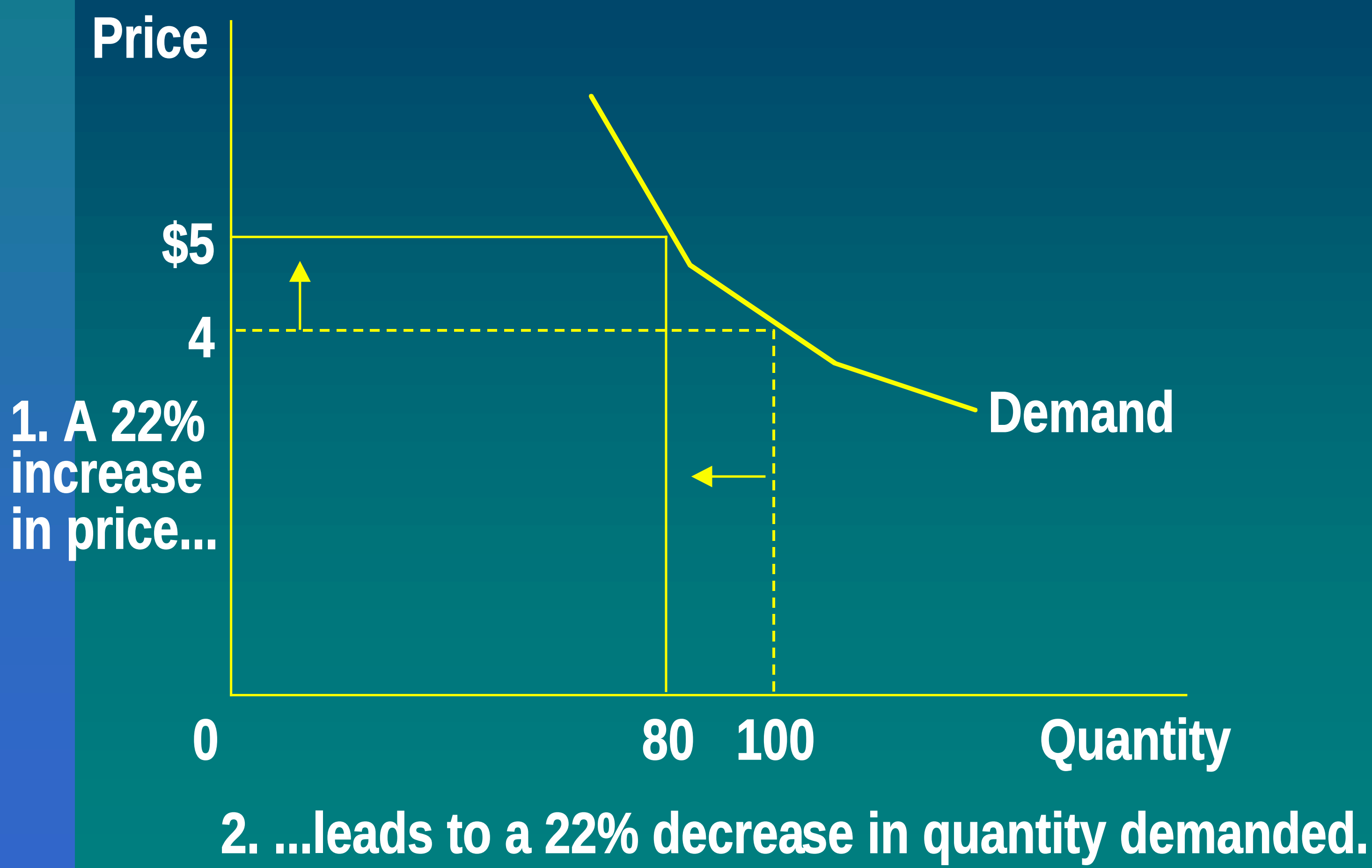
# The Price Elasticity of Demand: Perfectly Inelastic



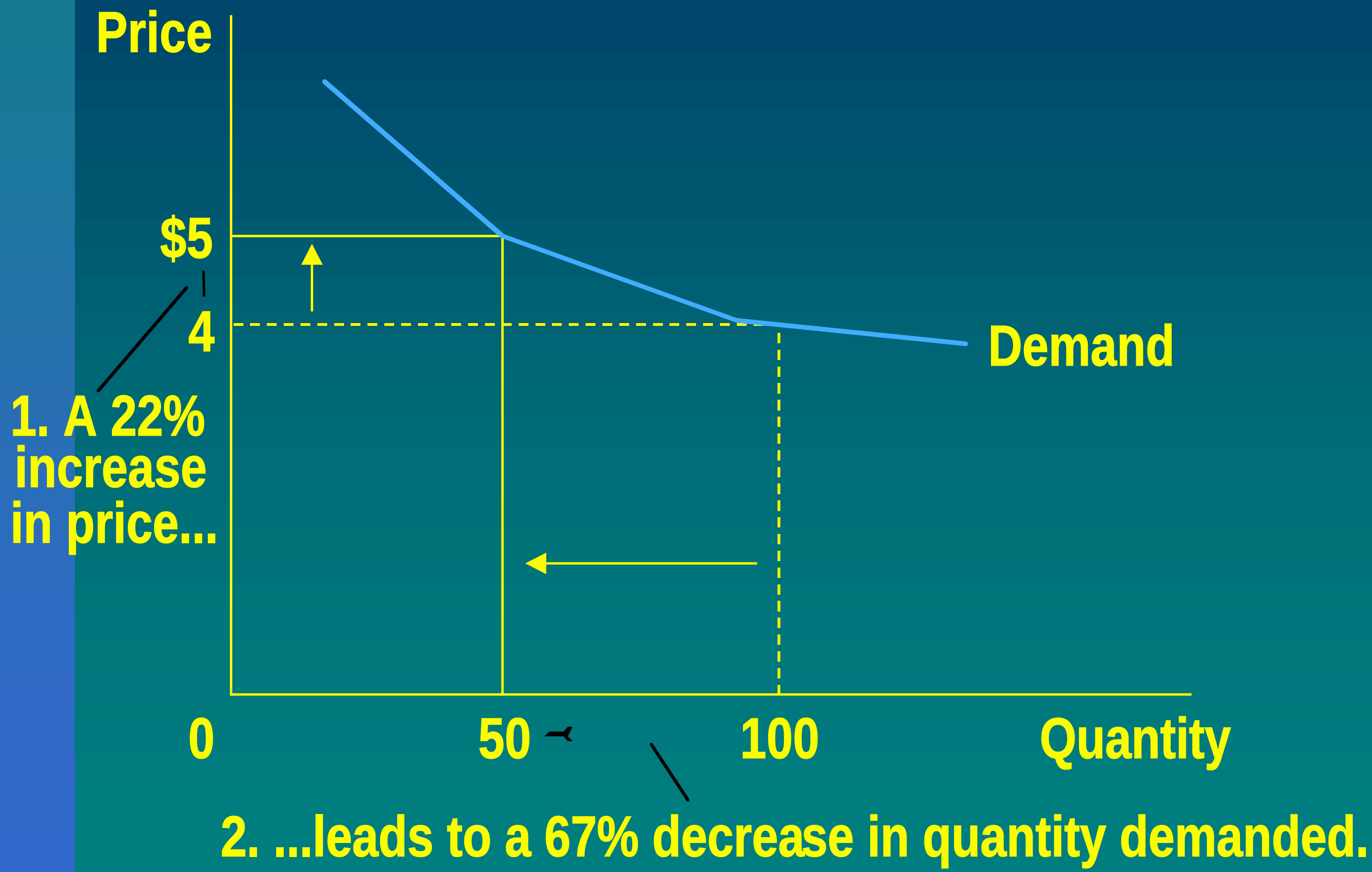
# The Price Elasticity of Demand: Perfectly Elastic



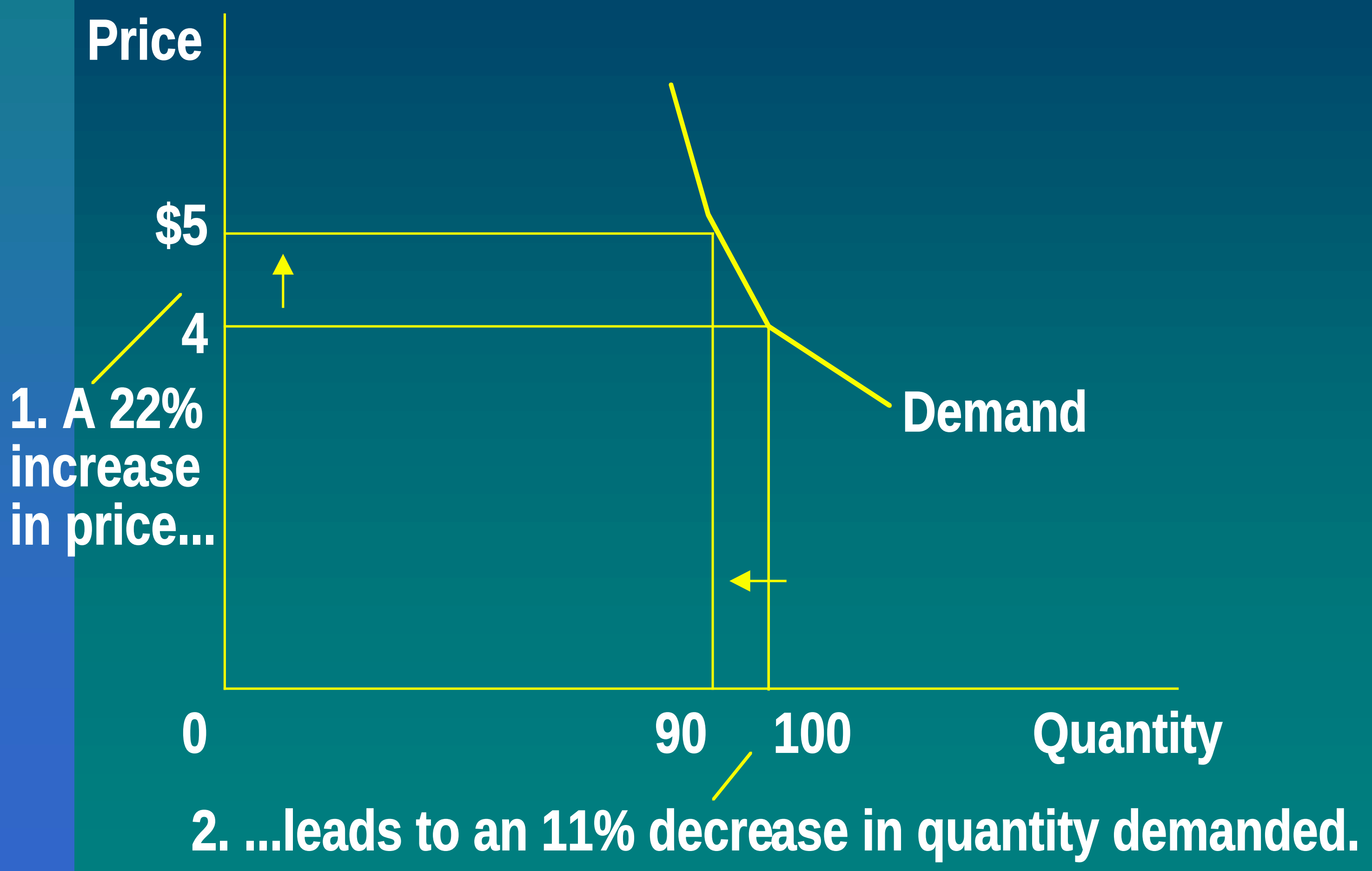
# The Price Elasticity of Demand: Unit Elastic



# The Price Elasticity of Demand: Elastic Demand



# The Price Elasticity of Demand: Inelastic Demand



# 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

# Determinants of Price Elasticity of Demand

- Demand tends to be more *inelastic* . . .
  - if the good is a necessity
  - the shorter the time period
  - the fewer the number of close substitutes
  - the more broadly defined the market

# 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.

# 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.

$$\text{Price Elasticity of Demand} = \frac{\begin{array}{c}\text{Percentage Change}\\ \text{in Quantity Demanded}\end{array}}{\begin{array}{c}\text{Percentage Change}\\ \text{in Price}\end{array}}$$

# Computing the Price Elasticity of Demand


$$E_D = \frac{(100-50)/100}{(4.00-5.00)/4.00}$$

$$= \frac{50\ percent}{-25\ percent} = -2$$

*Demand is price elastic*

# Changing elasticity along the demand curve

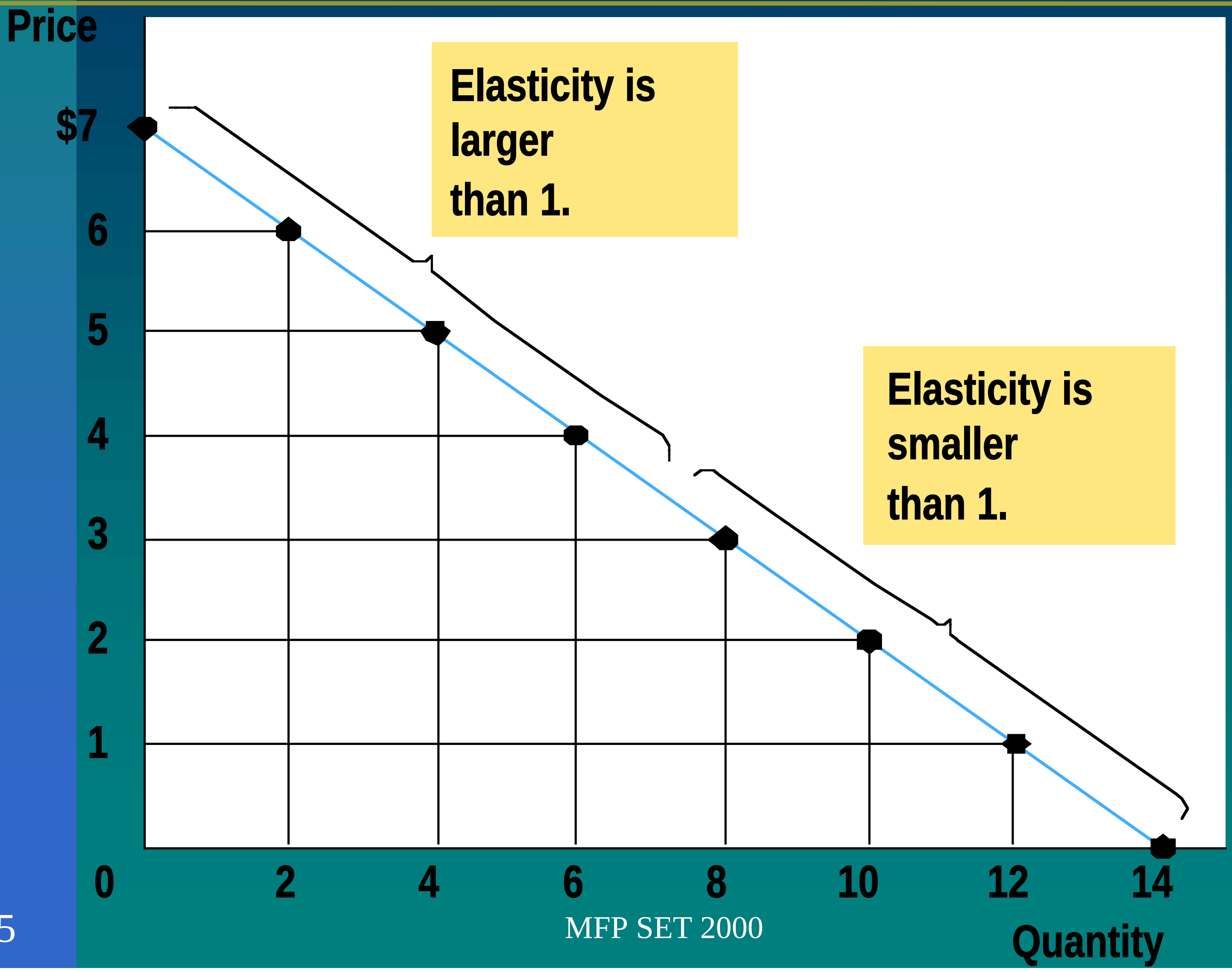


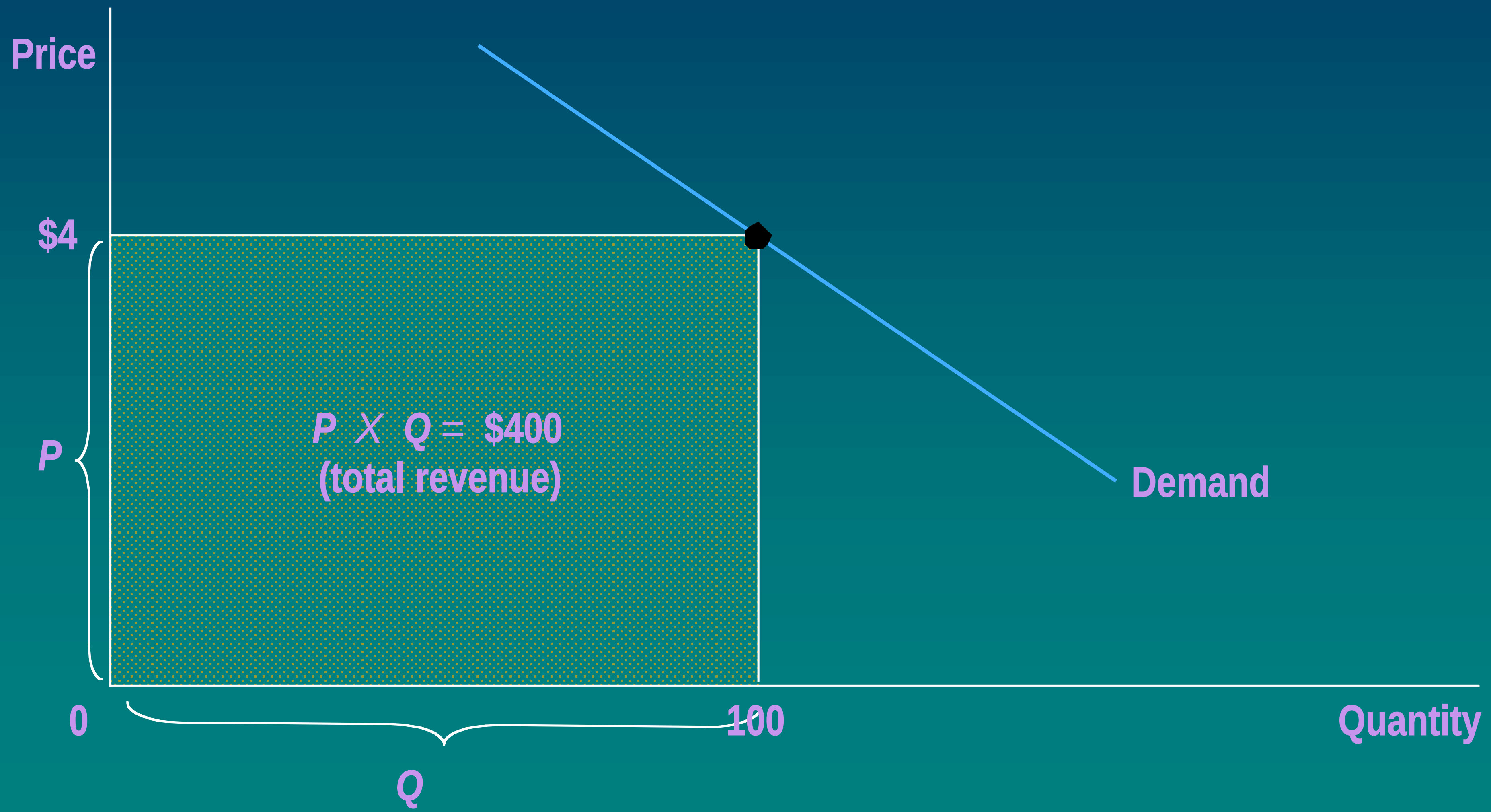

Figure 5-5

# 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.

$$TR = P \times Q$$

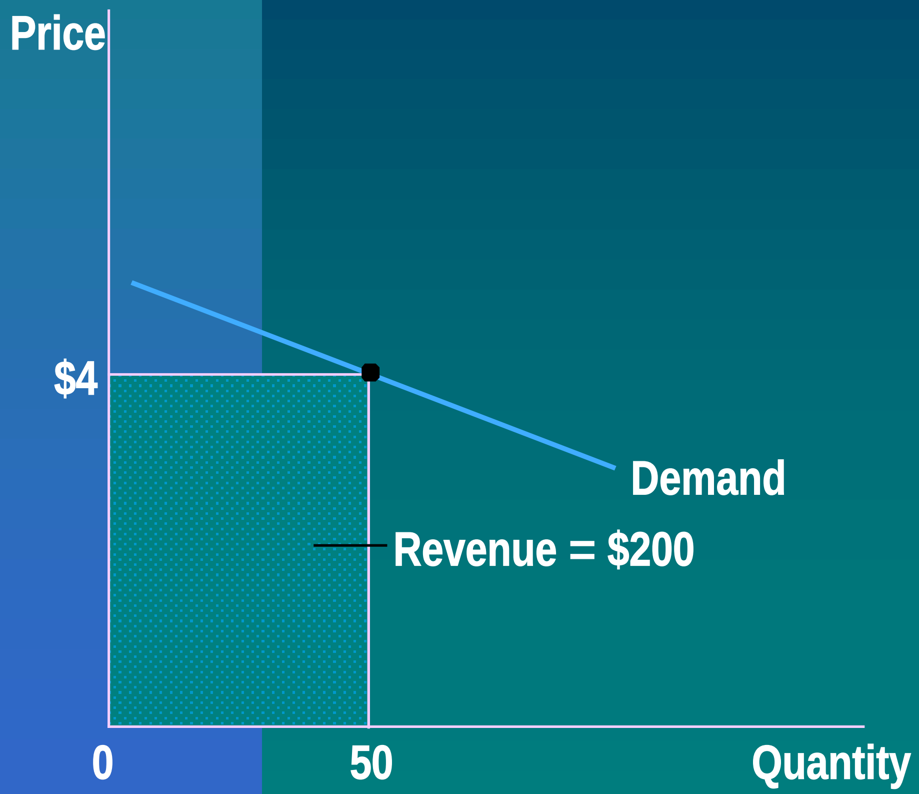
# Elasticity and Total Revenue

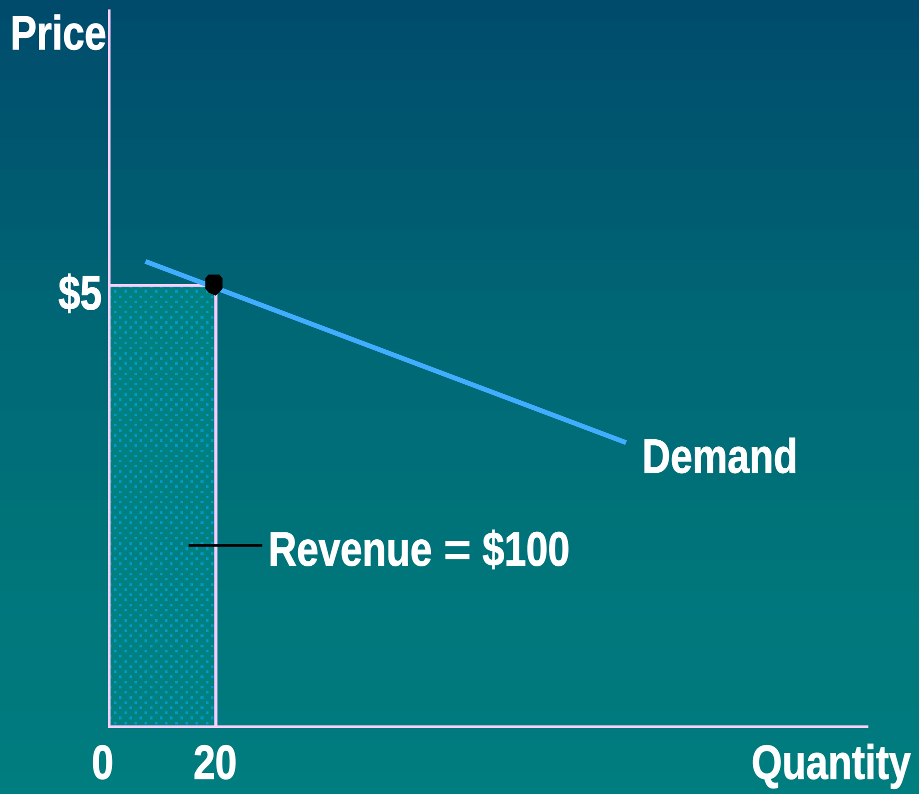


# Elasticity and Total Revenue

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

# Elasticity and Total Revenue: Elastic Demand

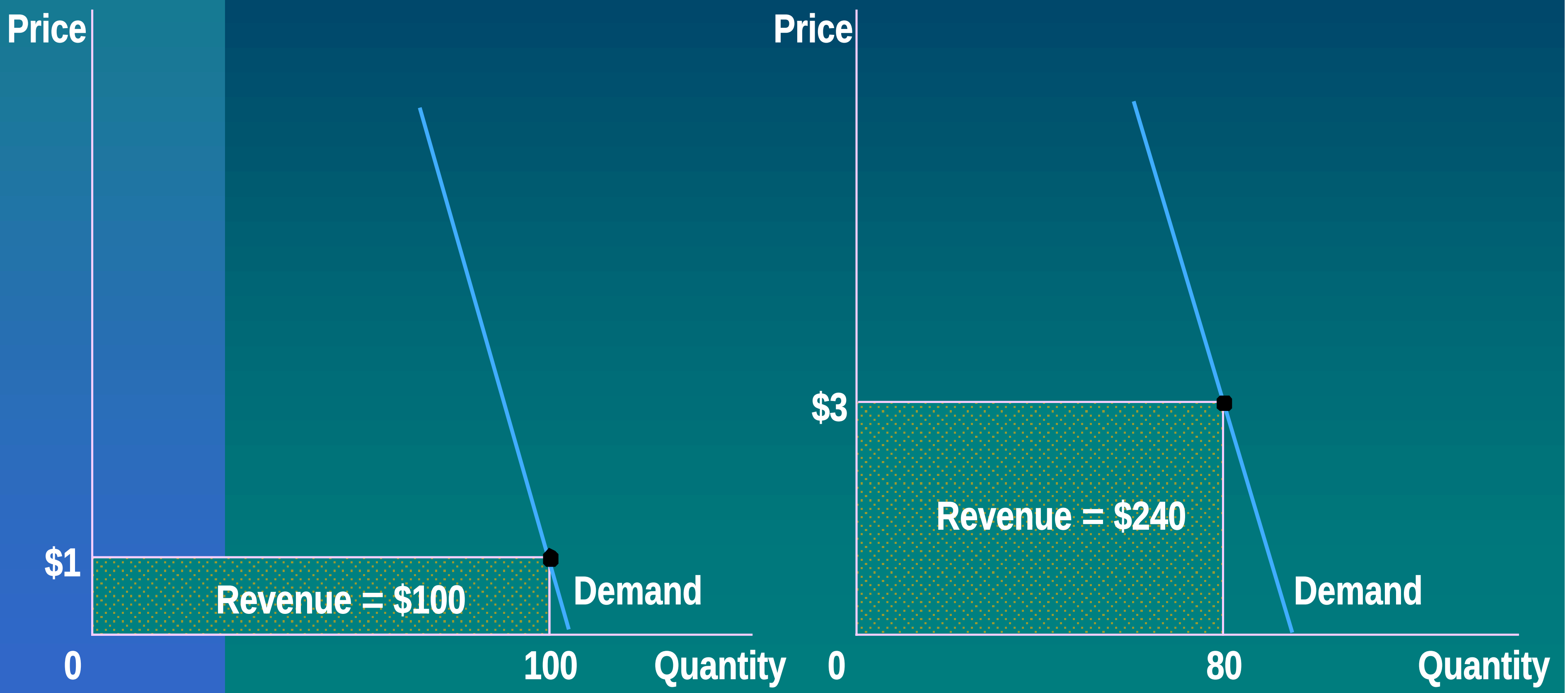


# Elasticity and Total Revenue

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

# Elasticity and Total Revenue: 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

$$\text{Income Elasticity of Demand} = \frac{\begin{array}{c}\text{Percentage Change in}\\ \text{Quantity Demanded}\end{array}}{\begin{array}{c}\text{Percentage Change}\\ \text{in Income}\end{array}}$$

# Income Elasticity... Types

- Higher income *raises* the quantity demanded for normal goods but *lowers* the quantity demanded for inferior goods
- Goods regarded as necessities tend to be income inelastic
  - food, fuel, clothing, utilities, & medical services
- Goods regarded as luxuries tend to be income elastic
  - sports cars, expensive foods

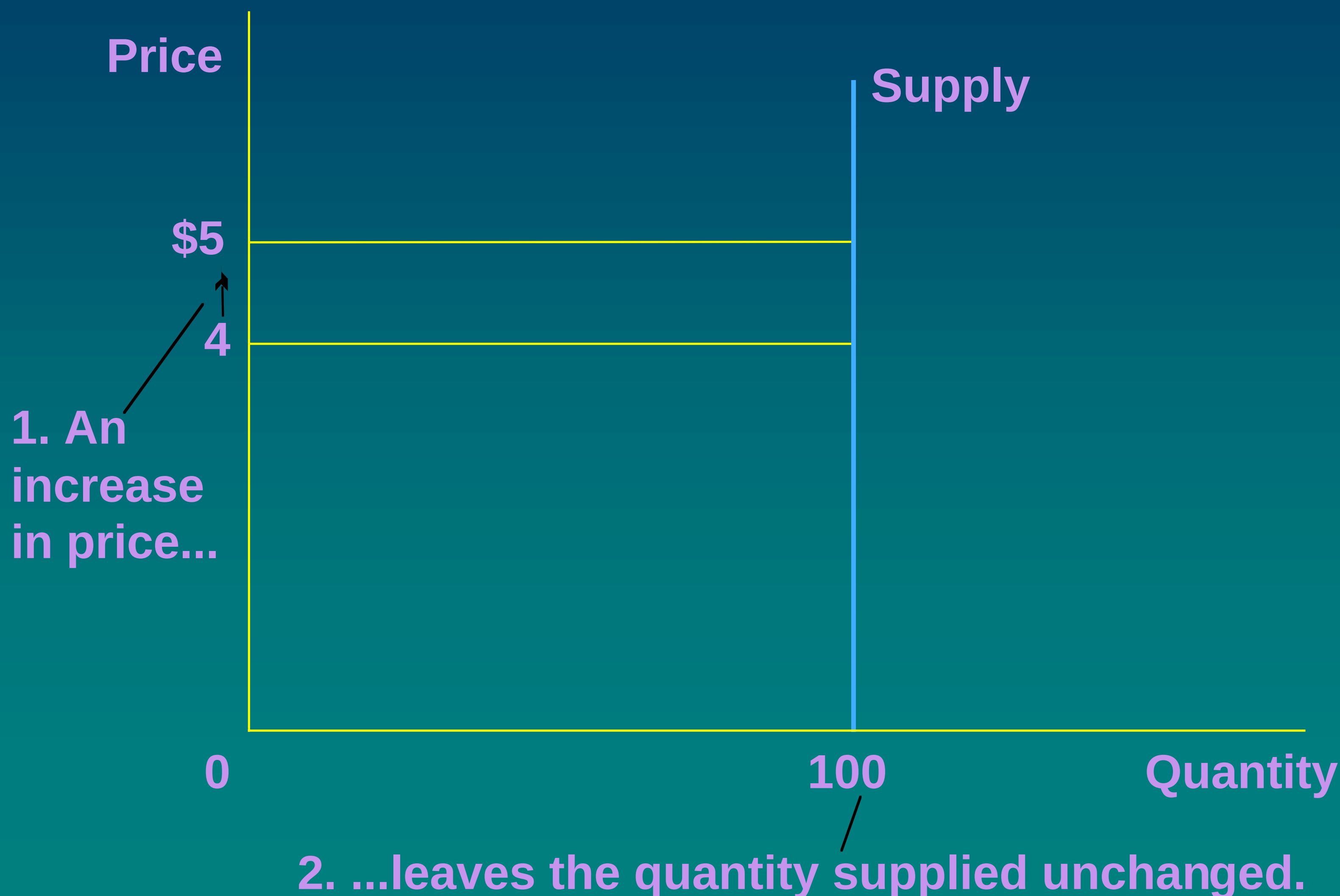
# Price Elasticity of Supply

- Price elasticity of supply is the percentage change in quantity supplied resulting from a one percent change in price

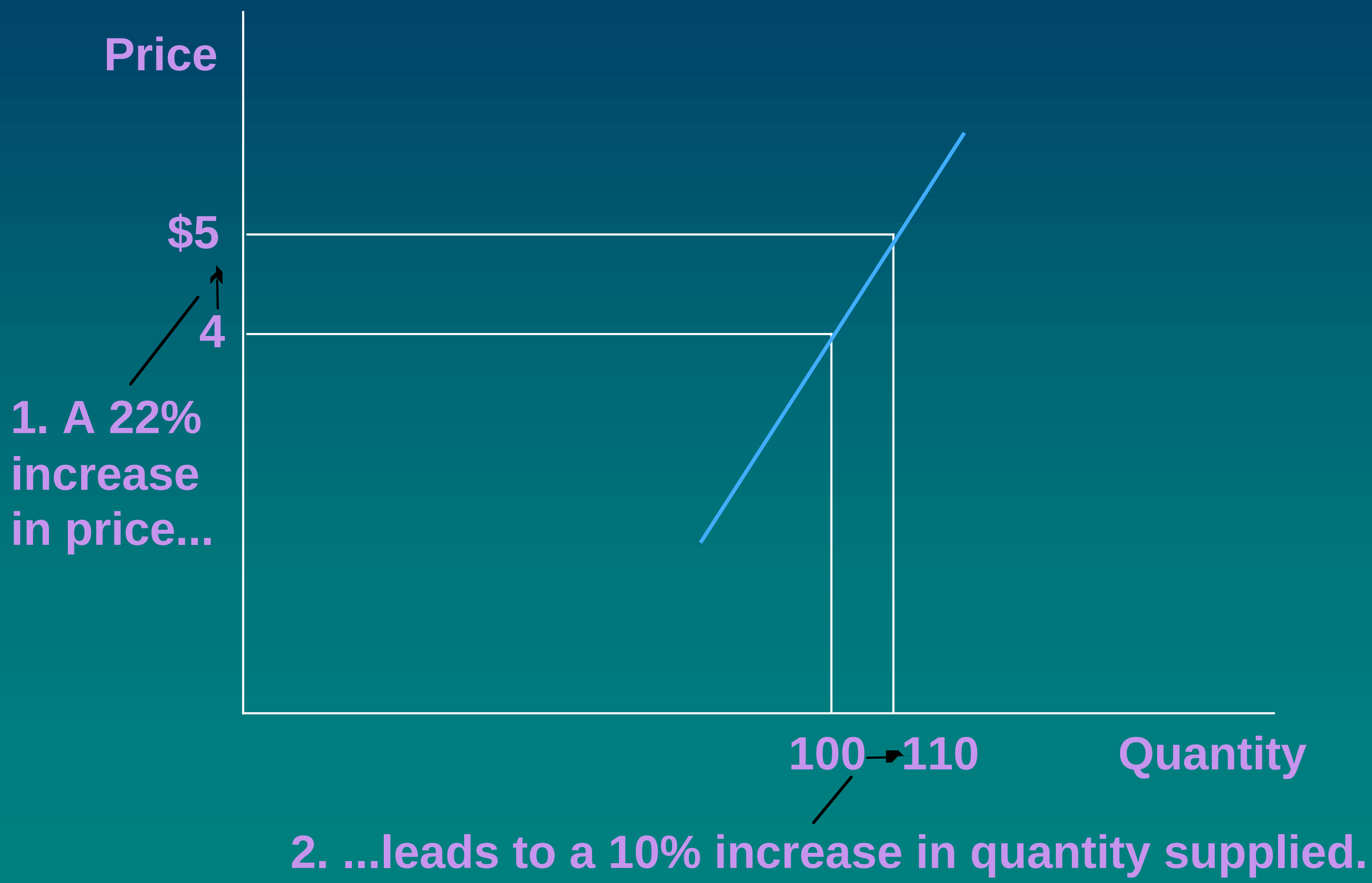
# Ranges of Elasticity

- Perfectly Elastic
  $E_S = \infty$
- Relatively Elastic
  $E_S > 1$
- Unit Elastic
  $E_S = 1$
- Relatively Inelastic
  $E_S < 1$
- Perfectly Inelastic
  $E_S = 0$

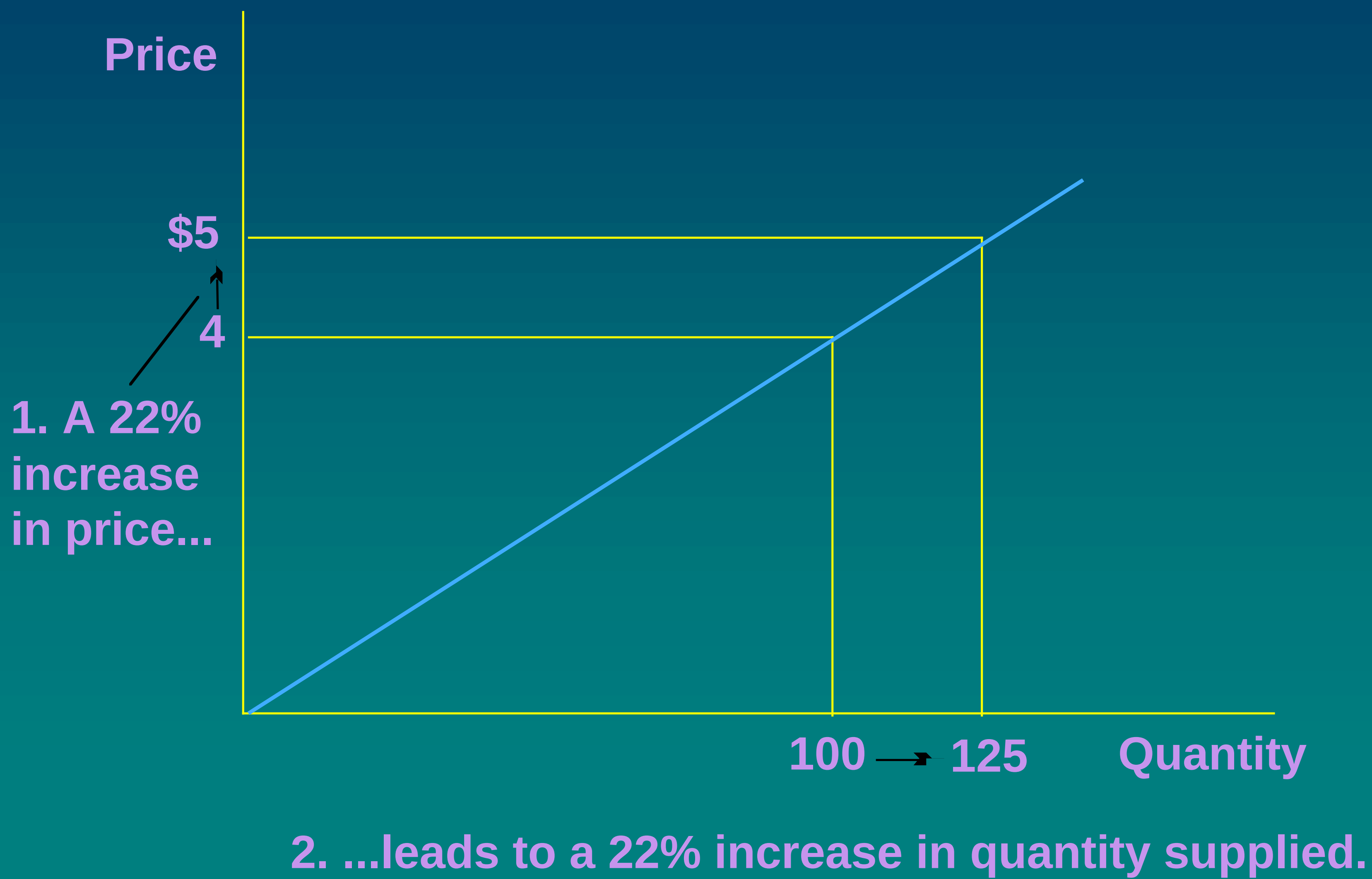
# Price Elasticity of Supply: Perfectly Inelastic Supply



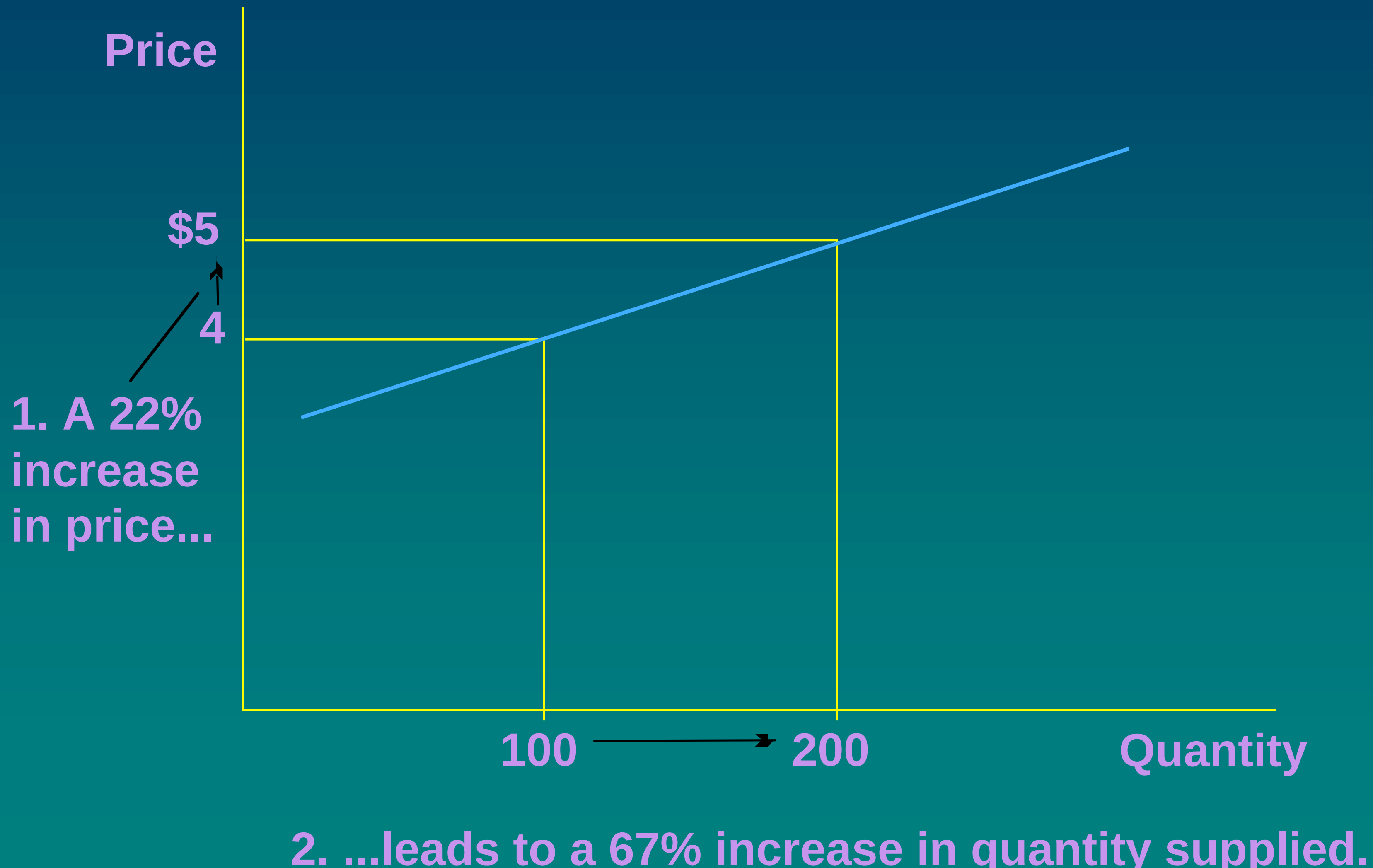
# Price Elasticity of Supply: Inelastic Supply



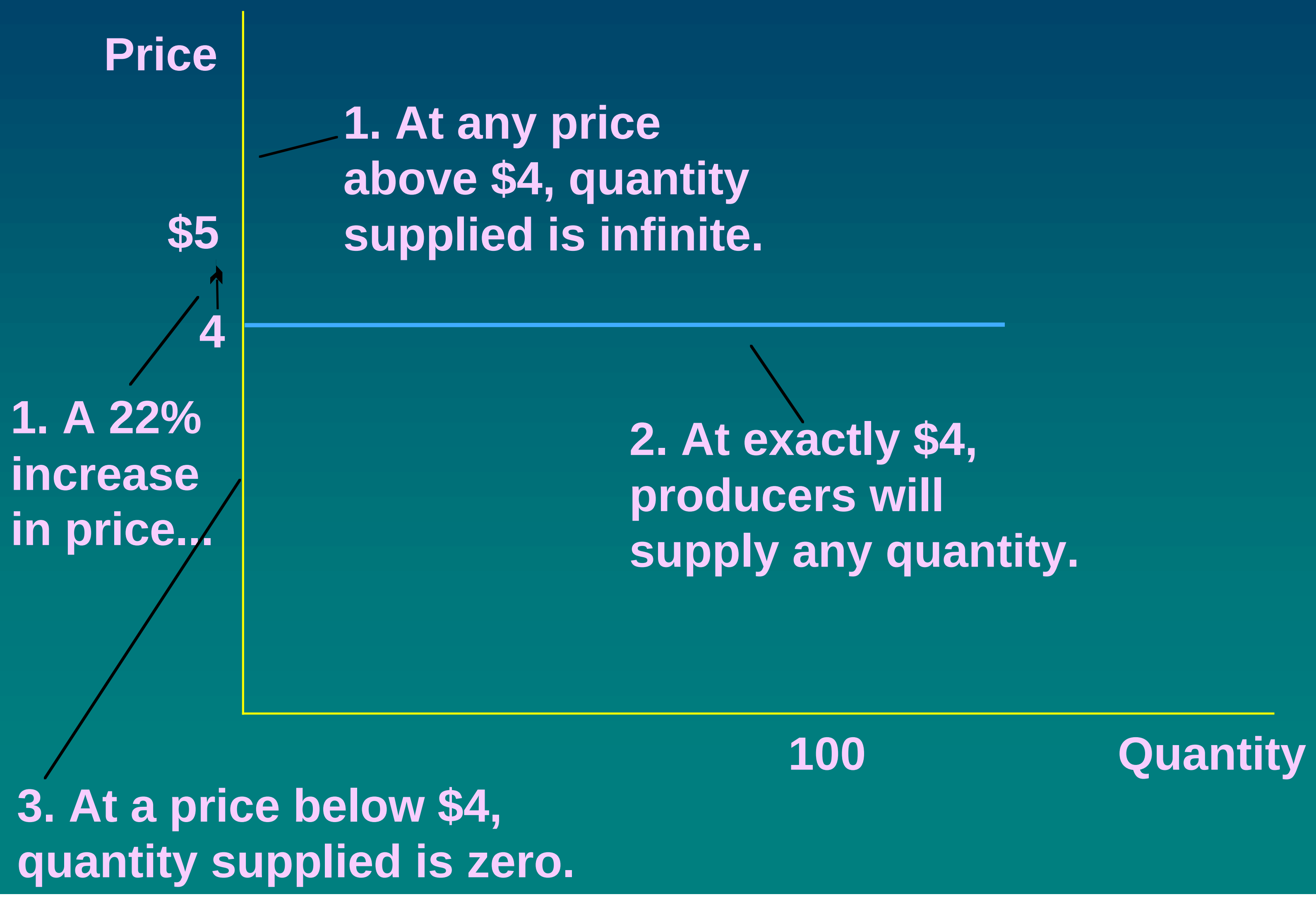
# Price Elasticity of Supply: Unit Elastic Supply



# Price Elasticity of Supply: Elastic Supply



# Price Elasticity of Supply: Perfectly Elastic Supply



# 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

# Computing the Price Elasticity of Supply

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

$$\text{Elasticity of Supply} = \frac{\text{Percentage Change in Quantity Supplied}}{\text{Percentage Change in Price}}$$

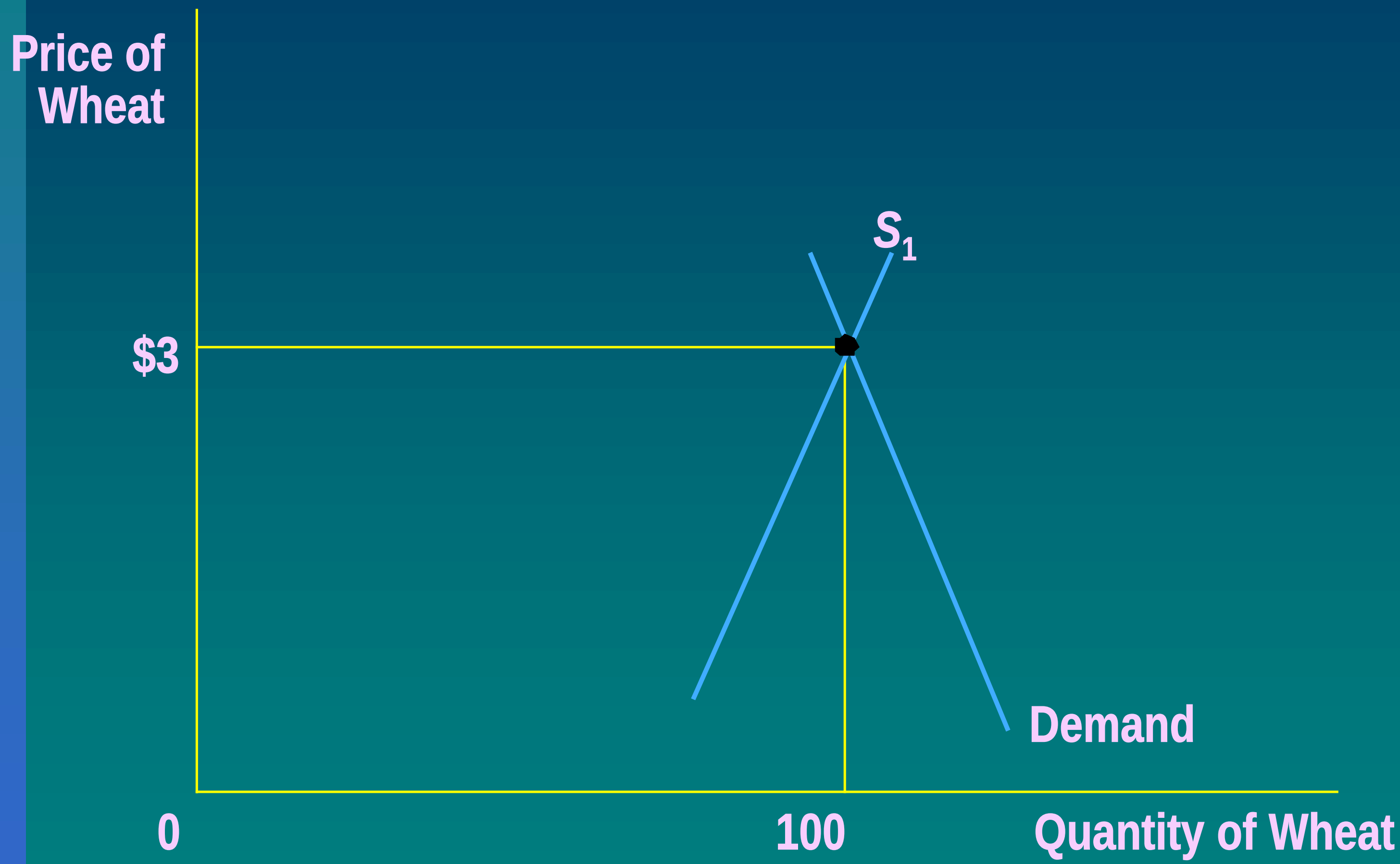
# Application of Elasticity

- 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?

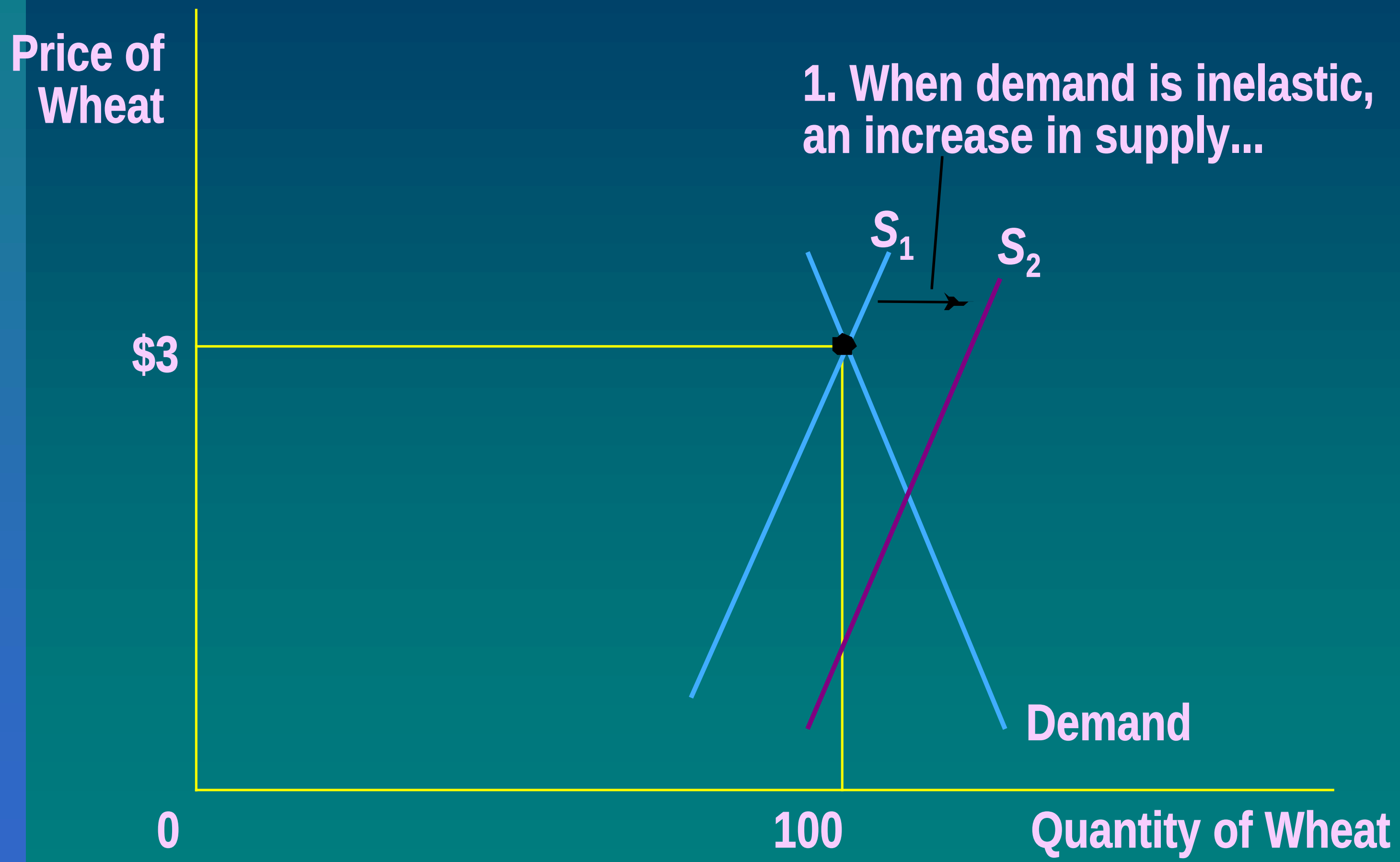
# Application of Elasticity

- 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

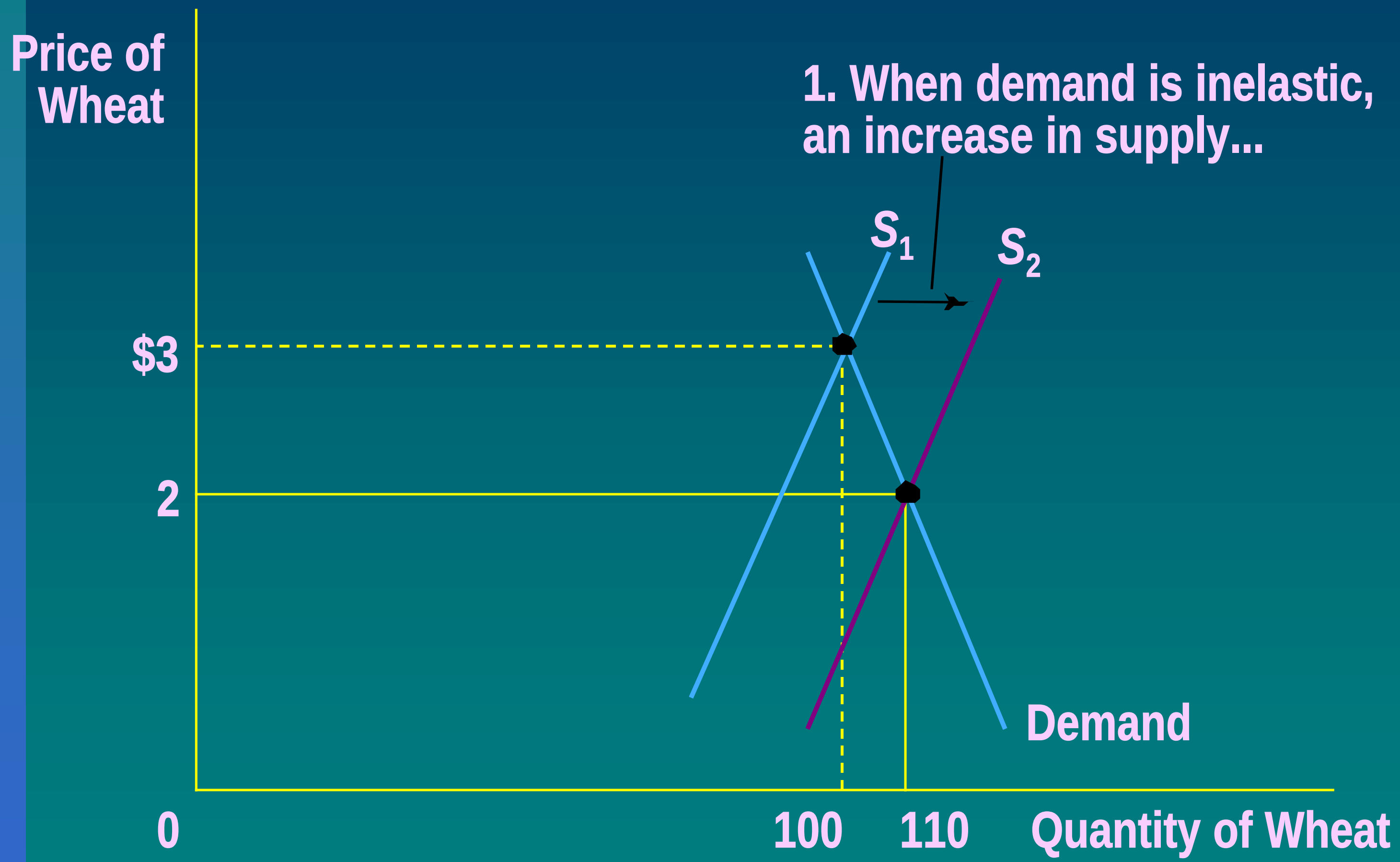
# An Increase in Supply in the Market for Wheat



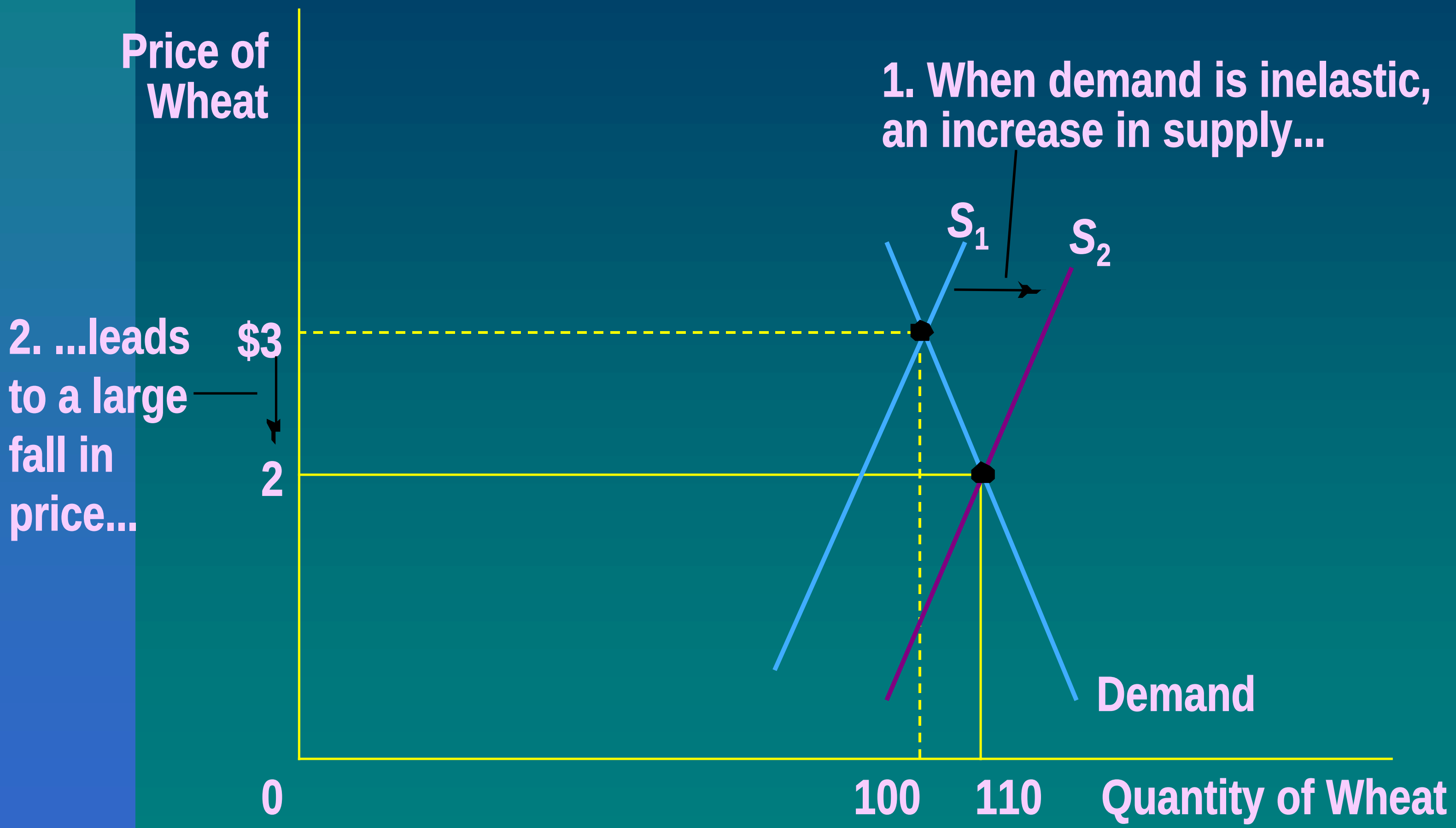
# An Increase in Supply in the Market for Wheat



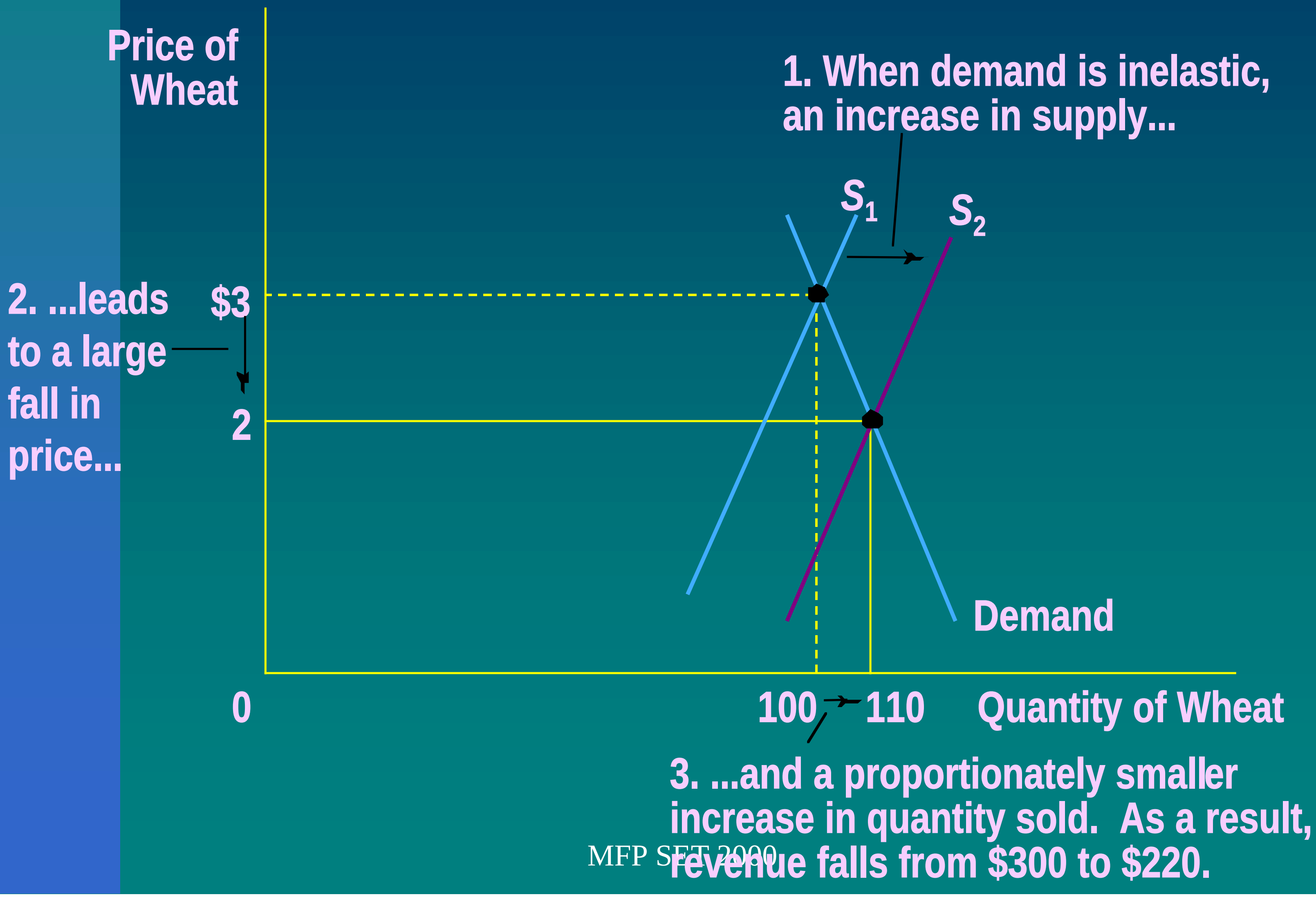
# An Increase in Supply in the Market for Wheat



# An Increase in Supply in the Market for Wheat



# An Increase in Supply in the Market for Wheat



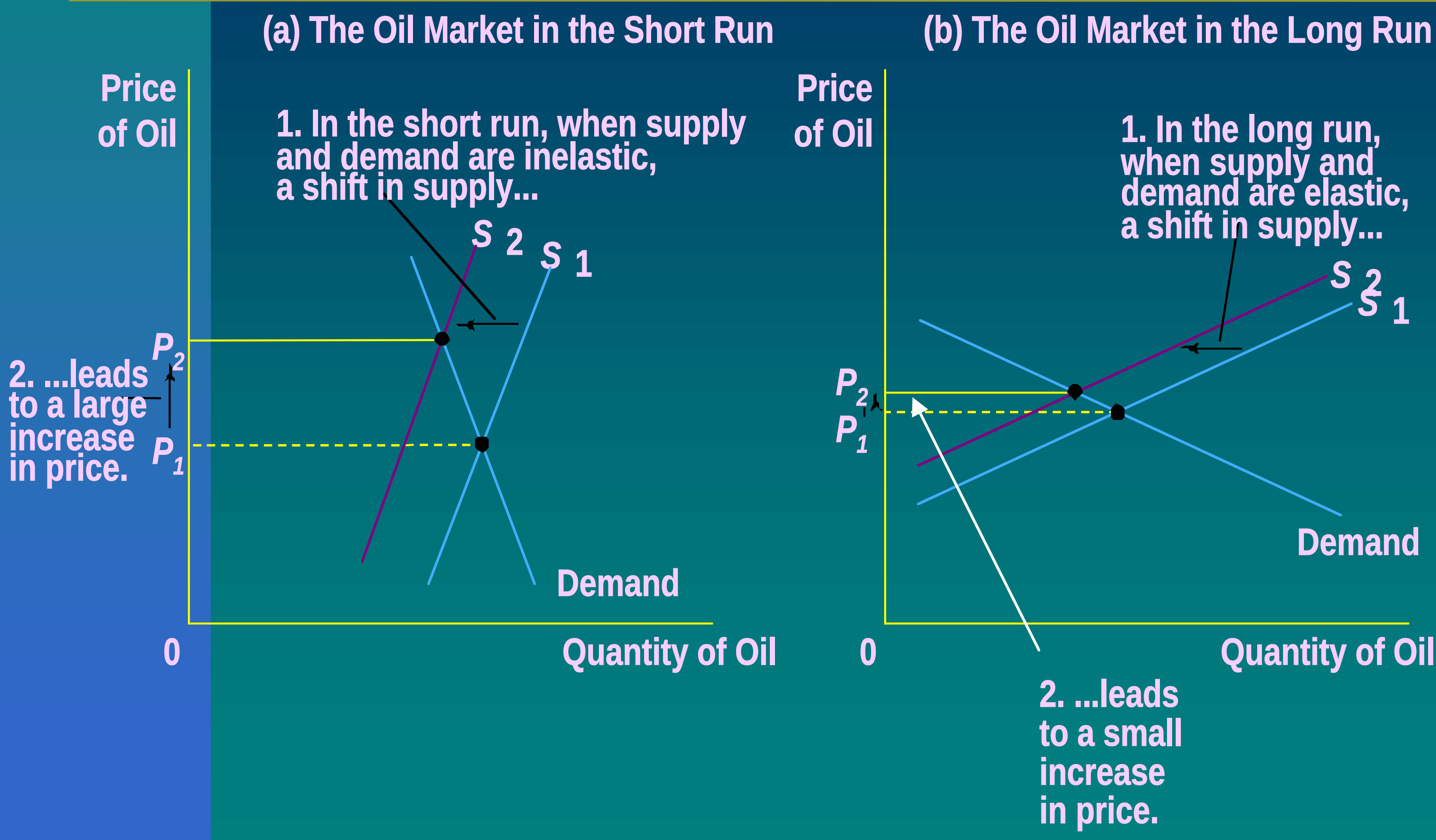
# Computing Elasticity

$$E_D = \frac{{}^{100-110}\!/_{100}}{{}^{3.00-2.00}\!/_{3.00}}$$

$$= \frac{-0.10}{0.33} \cup -0.30$$

*Demand is inelastic*

# Application: Oil price shocks



# Application: drug policy

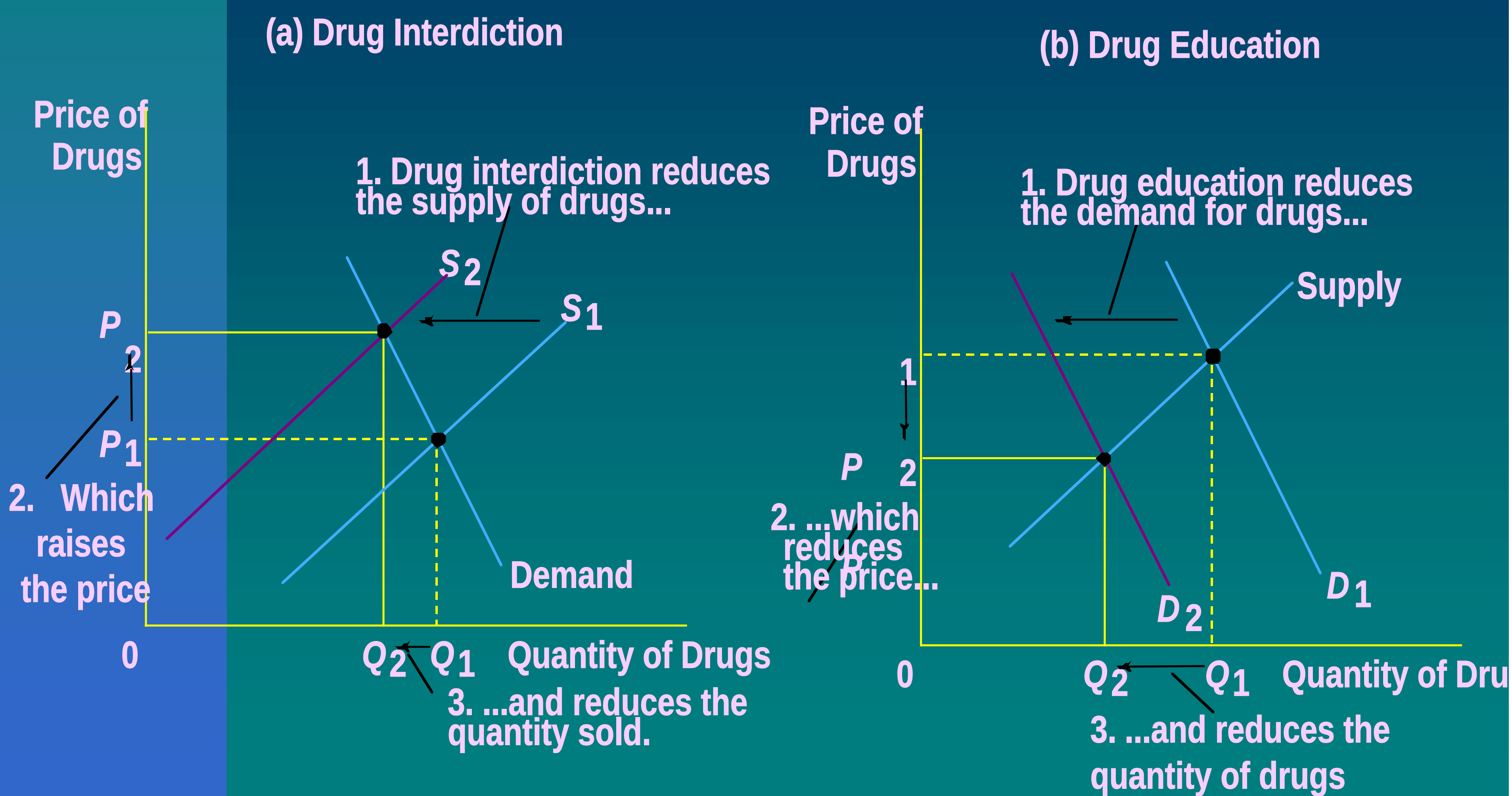



Figure 5-10

# Conclusion

- Price elasticity of demand measures how much the quantity demanded responds to changes in the 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
- The price elasticity of supply measures how much the quantity supplied responds to changes in the price
- In most markets, supply is more elastic in the long run than in the short run