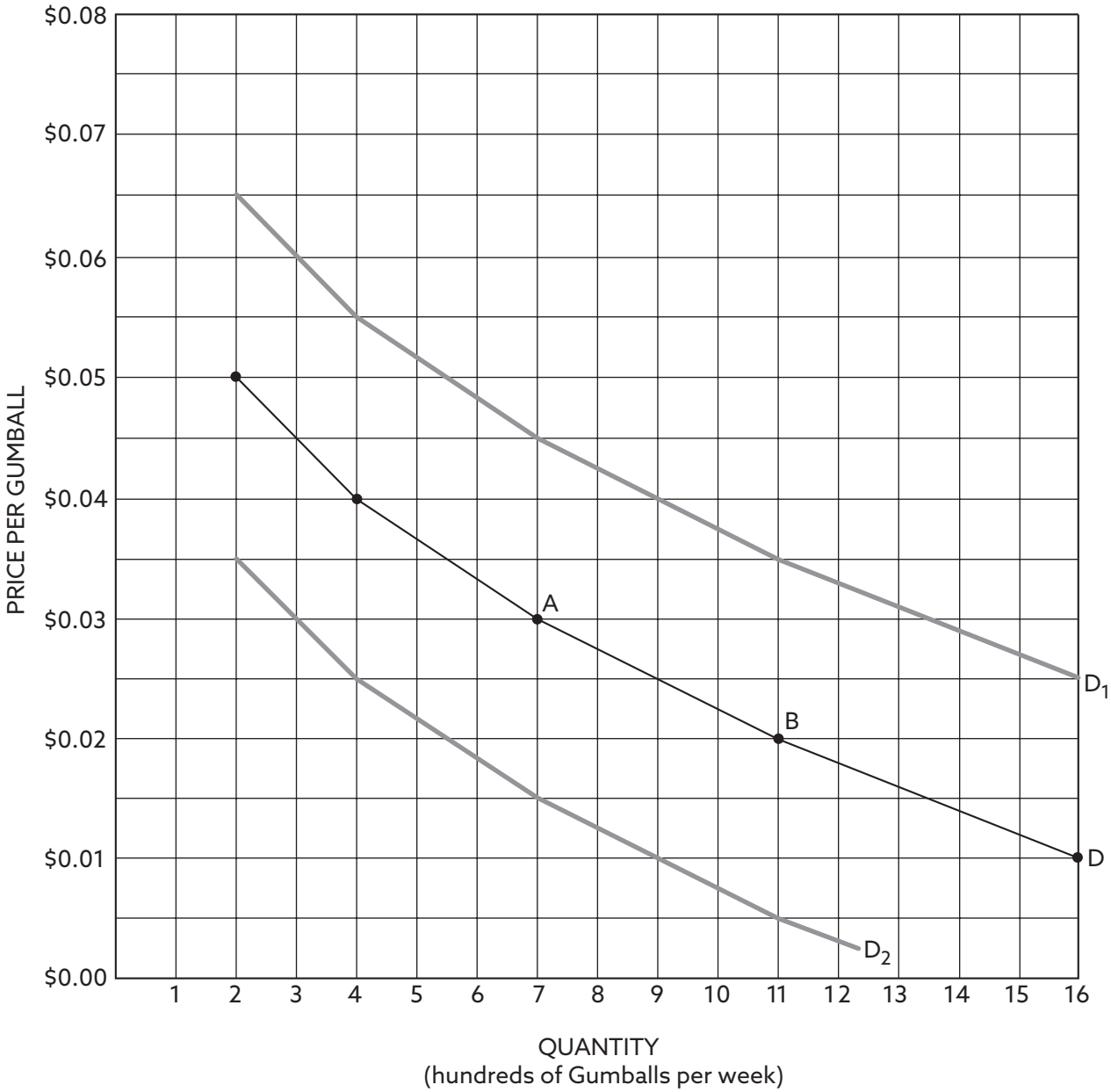
Illustrating the Difference between a Change in Demand and a Change in Quantity Demanded



Determinants of Demand

Factors that Shift the Demand Curve

- Change in consumer tastes
- Change in the number of buyers
- Change in consumer incomes
- Change in the prices of complementary and substitute goods
- Change in consumer expectations

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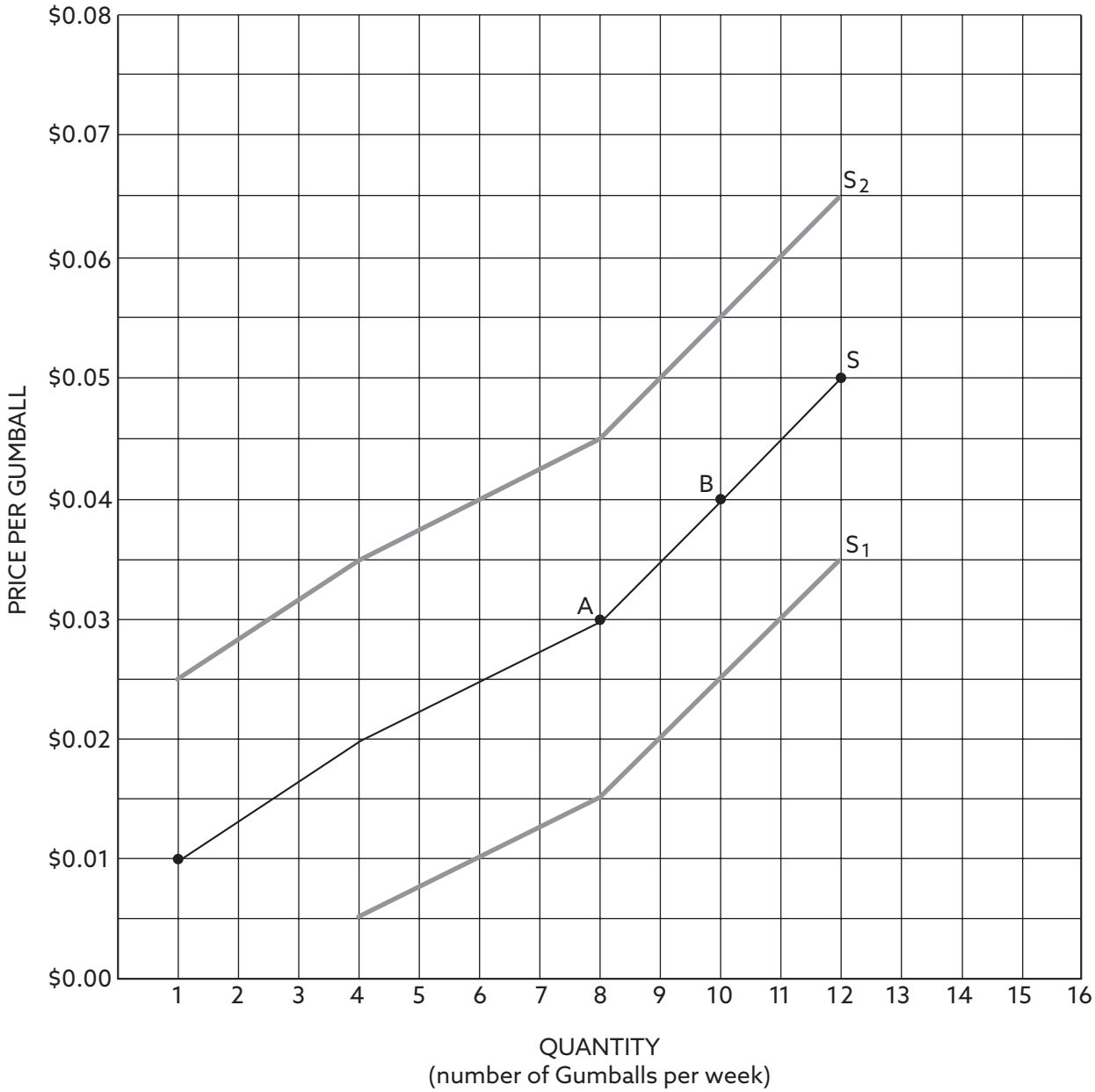
Illustrating the Difference between a Change in Supply and a Change in Quantity Supplied



Determinants of Supply

Factors that Shift the Supply Curve

- Change in resource prices or input prices
- Change in technology
- Change in taxes and subsidies
- Change in the prices of other goods
- Change in producer expectations
- Change in the number of suppliers

Any factor that *increases* the cost of production *decreases* supply.

Any factor that *decreases* the cost of production *increases* supply.

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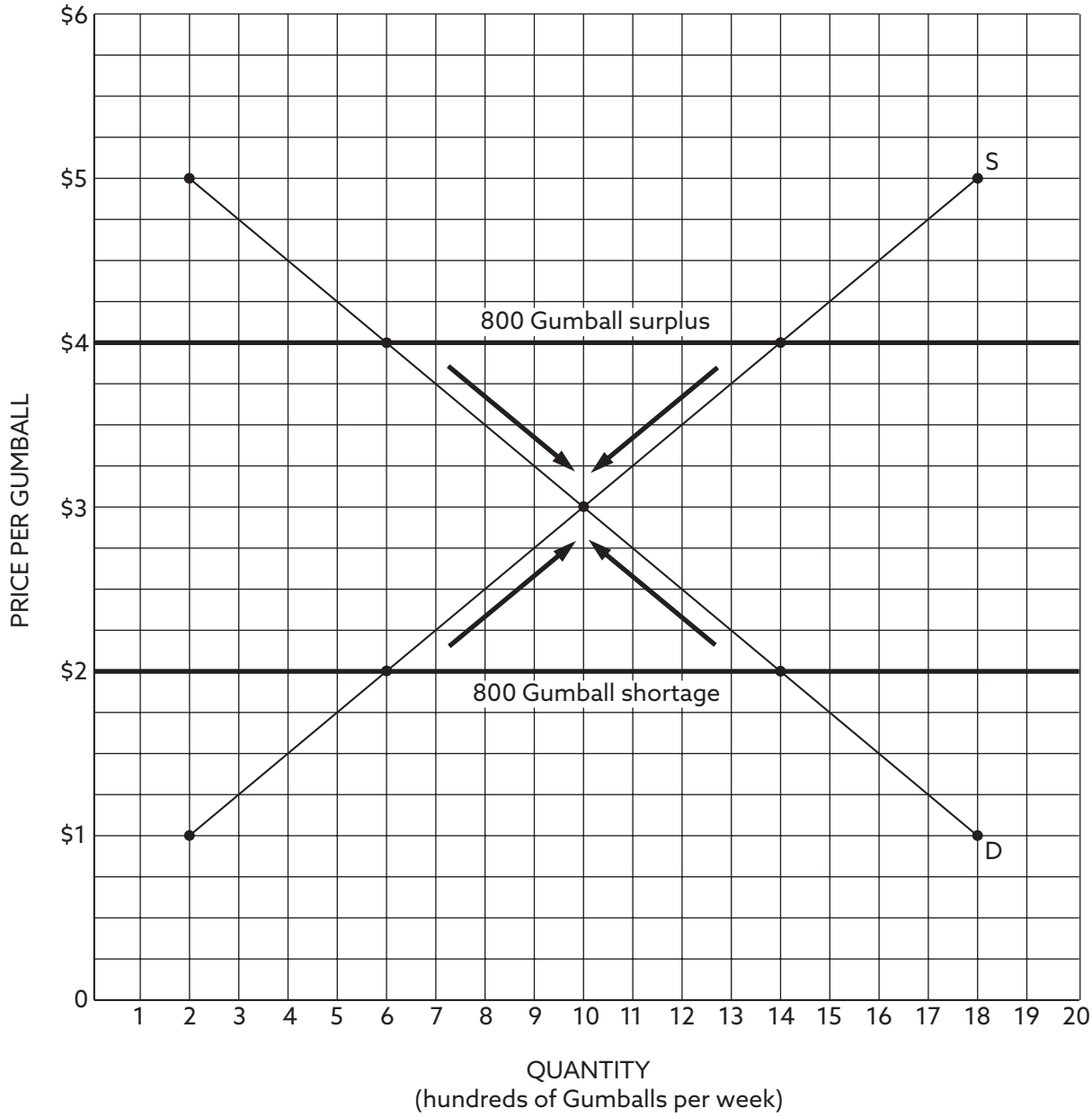
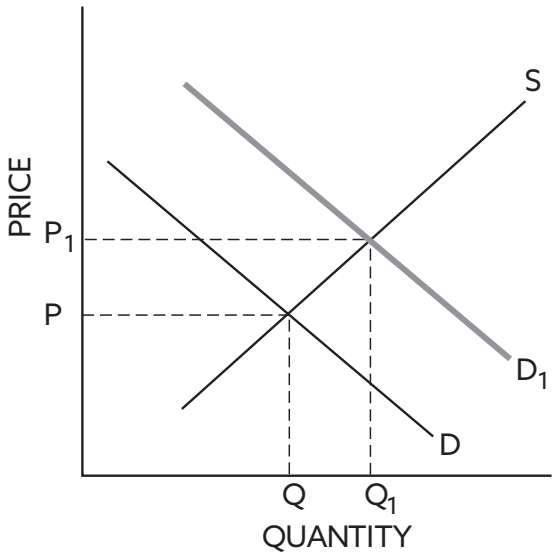
Equilibrium and Disequilibrium

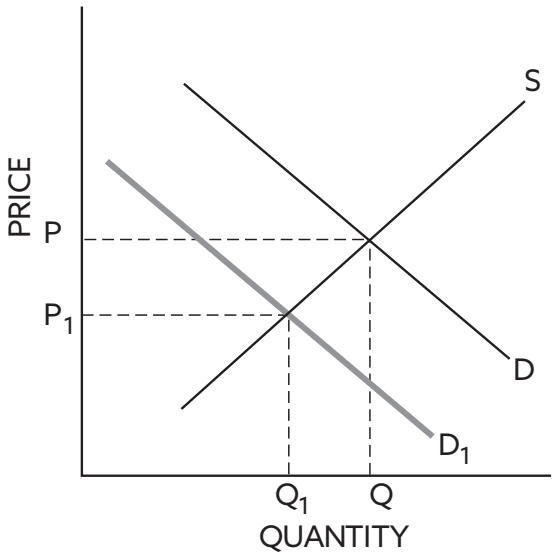


The Effects of Shifts in Demand or Supply



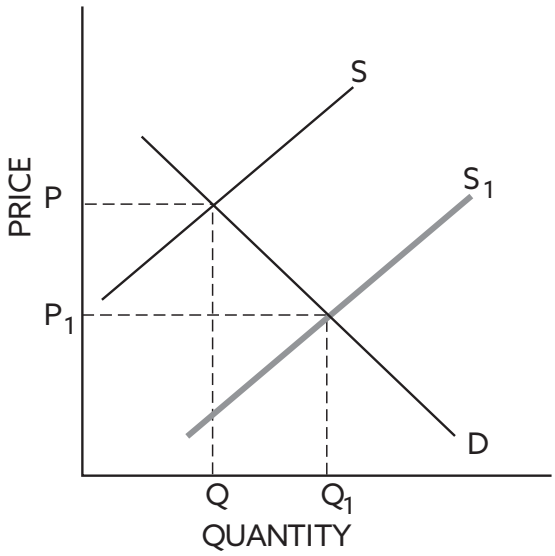
A. INCREASE IN DEMAND

D ↑
P ↑
Q ↑



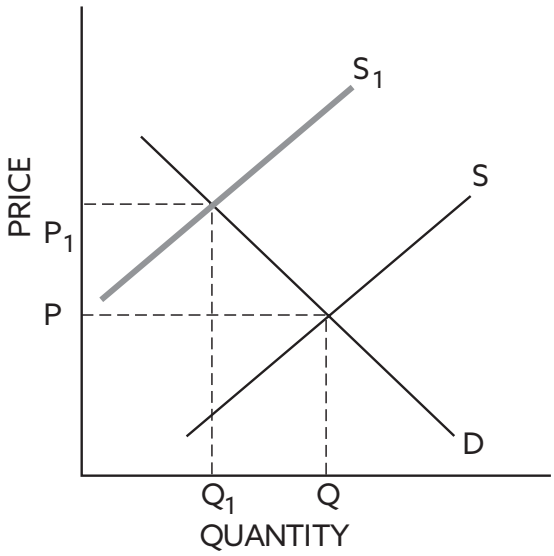
B. DECREASE IN DEMAND

D ↓
P ↓
Q ↓



C. INCREASE IN SUPPLY

S ↑
P ↓
Q ↑



D. DECREASE IN SUPPLY

S ↓
P ↑
Q ↓

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Price Elasticity of Demand

The four determinants or factors that affect price elasticity of demand are:

- Availability of substitutes
- Nature of the Good – a luxury or a necessity?
- Proportion of income spent on the good
- How much time has elapsed since the time the price changed

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Price Elasticity of Demand

(1) $$\varepsilon_d = \frac{\text{percentage change in quantity demanded of Good X}}{\text{percentage change in price of Good X}} = \frac{\%\Delta Q_d}{\%\Delta P}.$$

(2) The Midpoint or Arc Method:

$$\varepsilon_d = \frac{\left[\dfrac{(Q_2-Q_1)}{(Q_2-Q_1)/2}\right]}{\left[\dfrac{(P_2-P_1)}{(P_2-P_1)/2}\right]}.$$

Example: When price increases from $9 to $10, the quantity demanded decreases from 12 units to 10 units.

$$\varepsilon_d = \frac{\left[\dfrac{(10-12)}{(10-12)/2}\right]}{\left[\dfrac{(\$10-\$9)}{(1\$10-\$9)/2}\right]} = \frac{\left(\dfrac{-2}{11}\right)}{\left(\dfrac{+\$1}{\$9.50}\right)} = \frac{-18.2\%}{+10.5\%} = -1.7.$$

As a result of the price rising by 10.5 percent, the quantity demanded fell by 18.2 percent. Since the absolute value of εd is greater than 1.0, the demand for the good is elastic over this price range.

(3) When price increased, total revenue decreased from $108 to $100. This means demand is elastic over this price range.

(4) Interpretation of the absolute value of the price elasticity of demand:

Absolute value of ε_d	Meaning
Greater than 1.0	Demand is *elastic* over this price range.
Equal to 1.0	Demand is *unit elastic* over this price range.
Less than 1.0	Demand is *inelastic* over this price range.

Summarizing Price Elasticity of Demand

Elasticity coefficient	Term	Description	Impact on total revenue of	
			Price increase	Price decrease
Greater than 1 $\lvert\varepsilon_d\rvert > 1$	Elastic	Quantity demanded changes by a larger percentage than does price.	Total revenue decreases.	Total revenue increases.
Equal to 1 $\lvert\varepsilon_d\rvert = 1$	Unit elastic	Quantity demanded changes by the same percentage as does price.	Total revenue is unchanged.	Total revenue is unchanged.
Less than 1 $\lvert\varepsilon_d\rvert < 1$	Inelastic	Quantity demanded changes by a smaller percentage than does price.	Total revenue increases.	Total revenue decreases.

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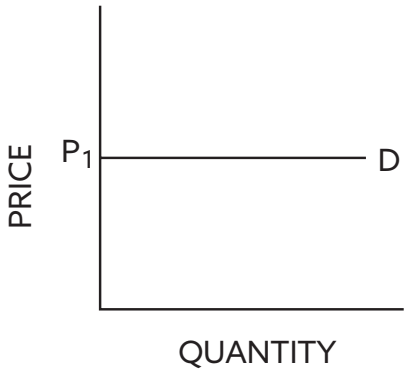
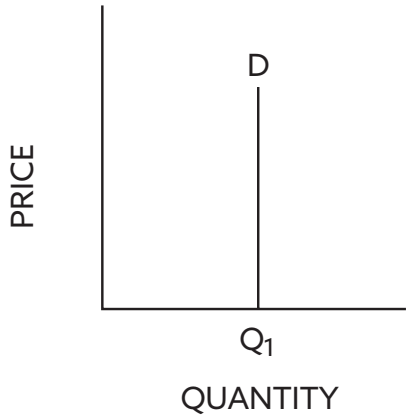
Two Extreme Cases of Price Elasticity of Demand

A **horizontal** demand curve is ***perfectly elastic*** because consumers will completely stop buying the good if the price is increased by even a small amount.



A **vertical** demand curve is ***perfectly inelastic*** because consumers will buy the same amount of the good no matter what the price



Elasticity and Total Revenue

Total Revenue (TR) = Price (P) x Quantity Demanded (Qd)

The Total Revenue Test can help you determine whether a product's demand is elastic or inelastic.

Relationship between price and total revenue	Category of price elasticity of demand
P and TR move in opposite directions	Elastic
P and TR move in the same direction	Inelastic
TR is unaffected by a change in P	Unit elastic

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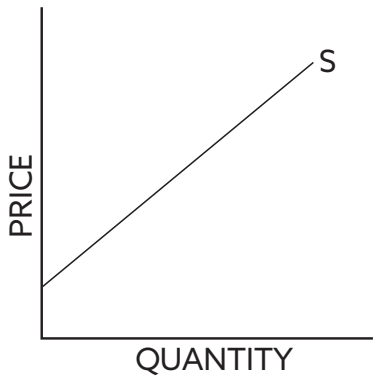
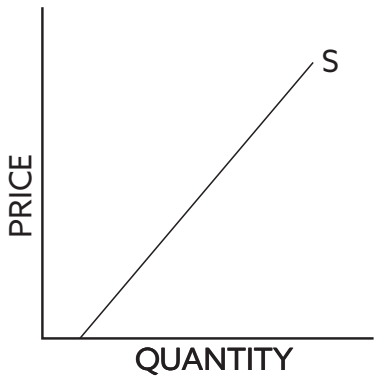
Price Elasticity of Supply

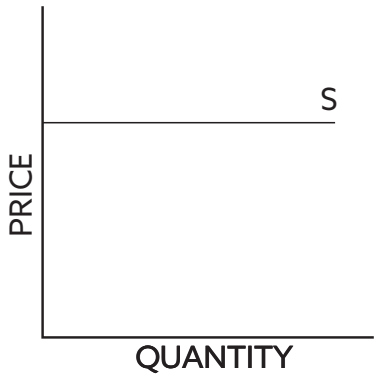
$$\text{PES} = \frac{\text{percentage change in quantity supplied}}{\text{percentage change in price}}$$



ELASTIC SUPPLY



INELASTIC SUPPLY



PERFECTLY
ELASTIC SUPPLY

PERFECTLY
INELASTIC SUPPLY

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Reasons for Inelastic Supply

Supply can be inelastic for the following reasons:

- Firms operating near to full capacity.
- Firms have low levels of stocks/inventory, therefore there are no surplus goods to sell.
- In the short term, capital is fixed in the short run. For example, firms do not have time to build a bigger factory in the immediate time.
- If it is difficult to employ factors of production, e.g., if highly skilled labor is needed
- With agricultural products, supply is inelastic in the short run, because it takes at least time to grow new crops.

Examples of goods with inelastic supply:

- Technology – It takes time and expertise to create new technology, especially with high demand (New iPhone)
- Agriculture crops and livestock – It takes time to grow and raise for consumption
- Economic booms – It takes a while to respond to high demand for goods and keep up the supply.

Reasons for Elastic Supply

Supply can be elastic for the following reasons:

Firms have space to expand and can increase production without experiencing an increase in costs.

Factors of production are easy to obtain. Inputs are widely used in other goods.

The more time a firm has to increase supply, the more elastic the supply.

Examples of goods with elastic supply:

Fads and trends – Relatively easy to make and easy transitioning for manufacturers to make with required materials. For example, a plastics manufacturer can easily switch production from shampoo bottles to soda bottles if the demand for soda increases.

Car Service and delivery – It is rather easy for people with transportation to switch to being an Uber driver or food delivery as the only basic requirements are a car and a phone app.

During an economic downturn – When demand falls, the firm will have unsold goods and large stock.

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Income Elasticity of Demand

The *income elasticity of demand* shows how responsive consumers are to a **change in their income.**

- If income and demand move in the same direction, the good is a *normal* good.
- If income and demand move in opposite directions, the good is an *inferior* good.

$$\varepsilon_I = \frac{\text{percentage change in quantity demanded of Good X}}{\text{percentage change in income}}$$

Table 2-6.1
INCOME ELASTICITY OF DEMAND

Value of ε_I	Interpretation
$\varepsilon_I > 0$	Good X is a normal (superior) good.
$\varepsilon_I < 0$	Good X is an inferior good.

Note that there is no absolute value and this test is about whether a good is normal or inferior, not elastic or inelastic.

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Cross-Price Elasticity of Demand

The *cross-price elasticity of demand* shows how responsive consumers of Good X are to a **change in the price of some other Good W.**

- Two goods are *substitutes* if the products could be used for the same purpose by the consumers.
- Two goods are *complements* if the demand of one good is linked to the demand for another good – you buy them together.

$$\varepsilon_{CP} = \frac{\text{percentage change in quantity demanded of Good X}}{\text{percentage change in price of Good W}}$$

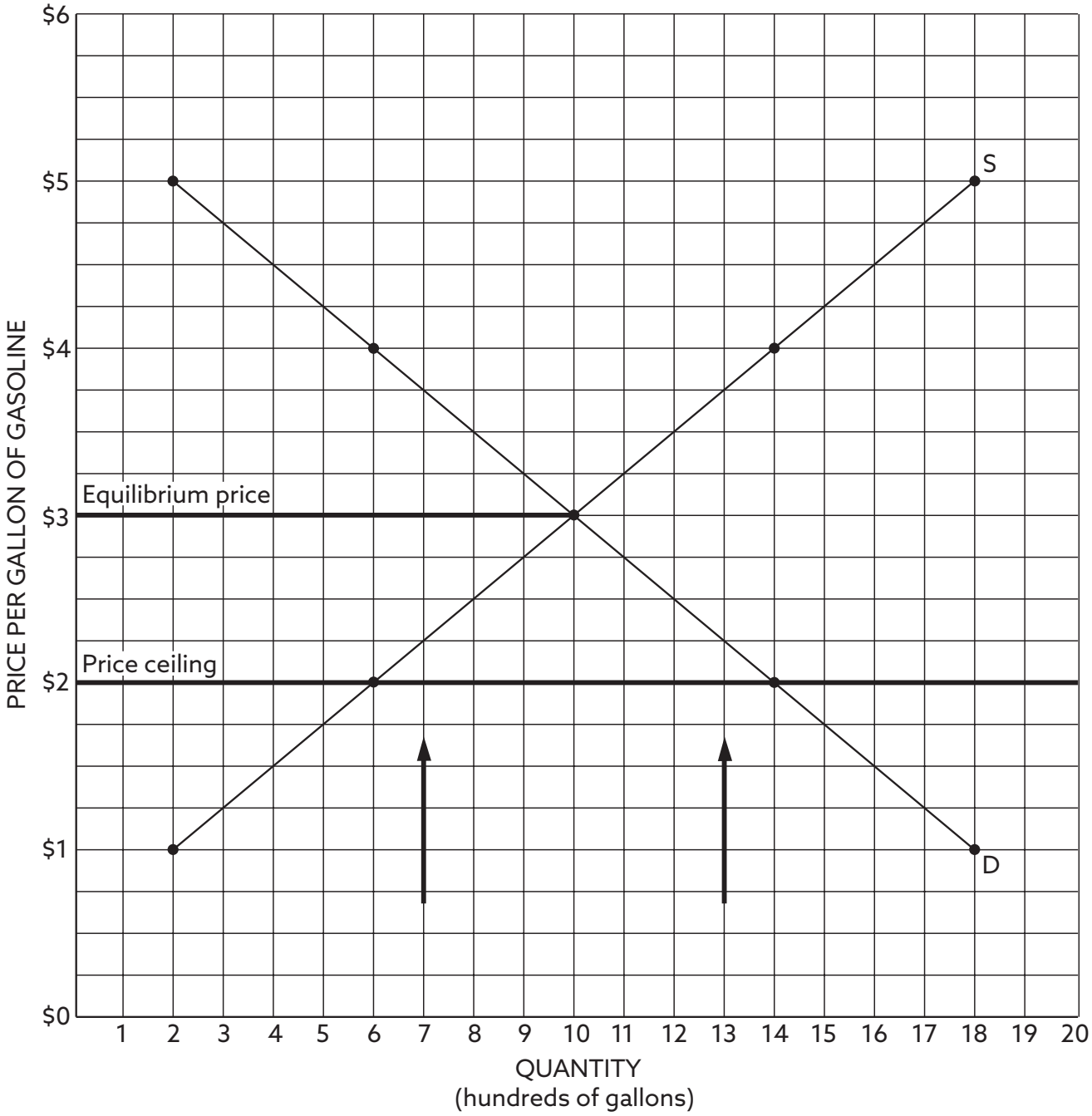
Table 2-6.2
CROSS-PRICE ELASTICITY OF DEMAND

Value of ε_{CP}	Interpretation
$\varepsilon_{CP} > 0$	X and W are substitute goods.
$\varepsilon_{CP} = 0$	X and W are unrelated goods.
$\varepsilon_{CP} < 0$	X and W are complementary goods.

Note that there is no absolute value and this test is about whether goods are substitutes or complements, not elastic or inelastic.

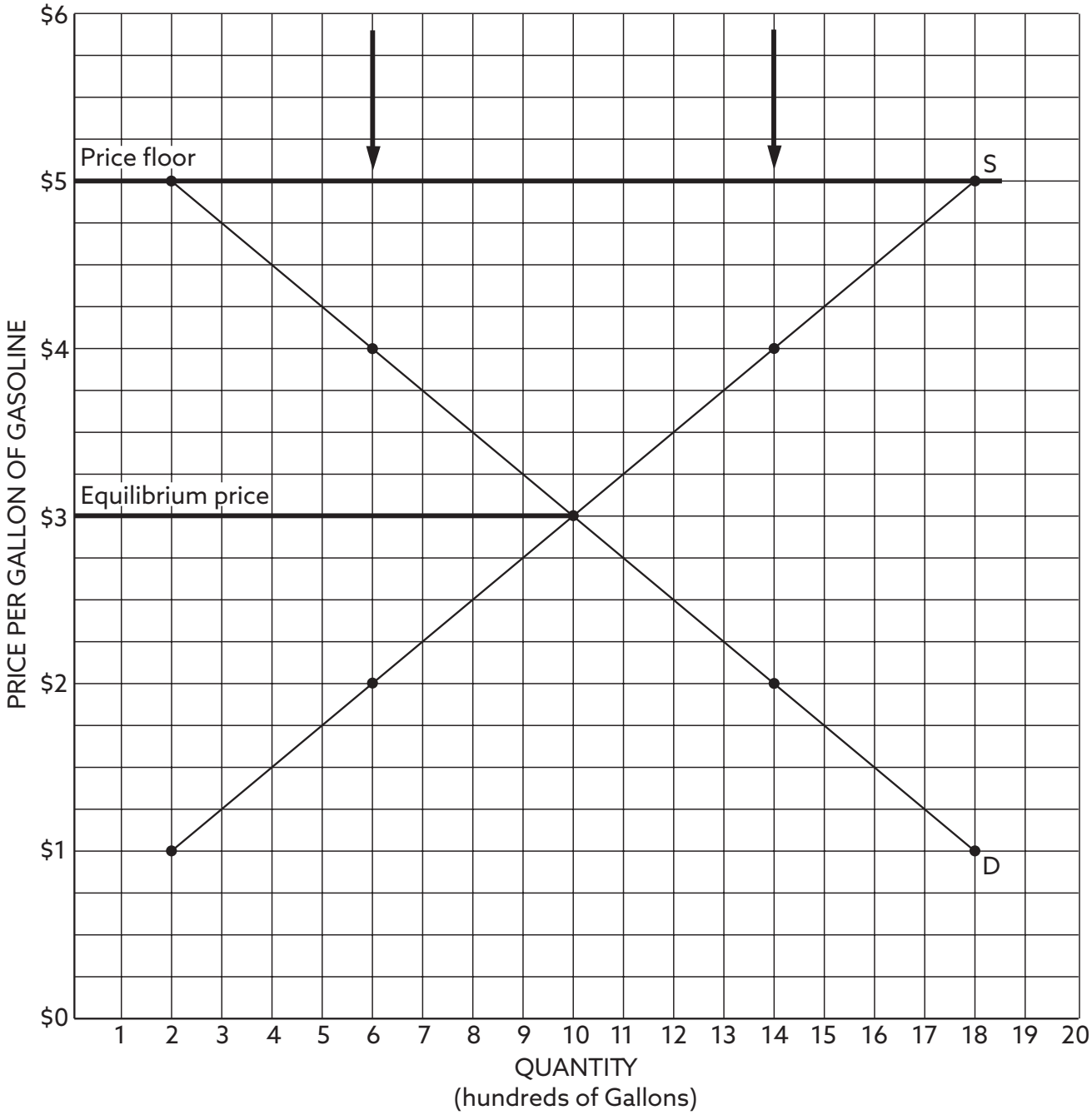
A Price Ceiling

A price ceiling is a government-imposed price control or limit that is placed below equilibrium. It results in a shortage. A price ceiling benefits consumers.



A Price Floor

A price floor is a government-imposed price control or limit that is placed above equilibrium. It results in a surplus. A price floor benefits producers.



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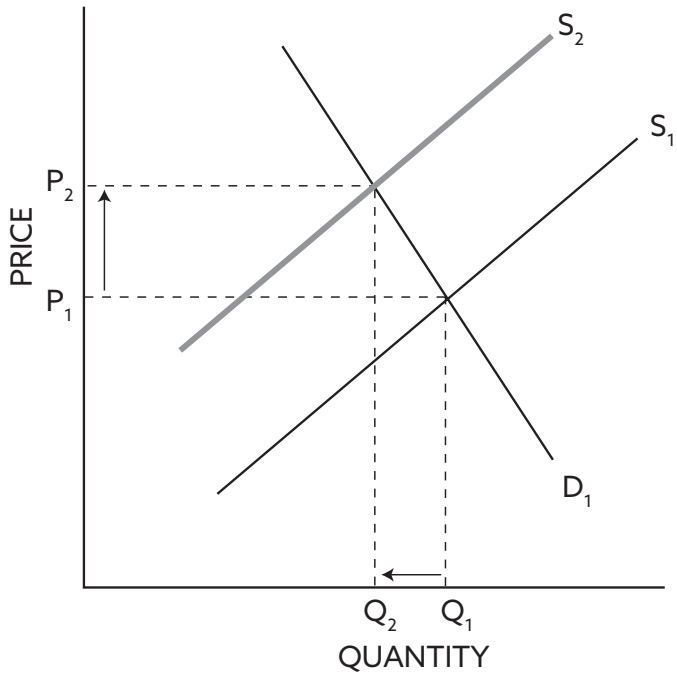
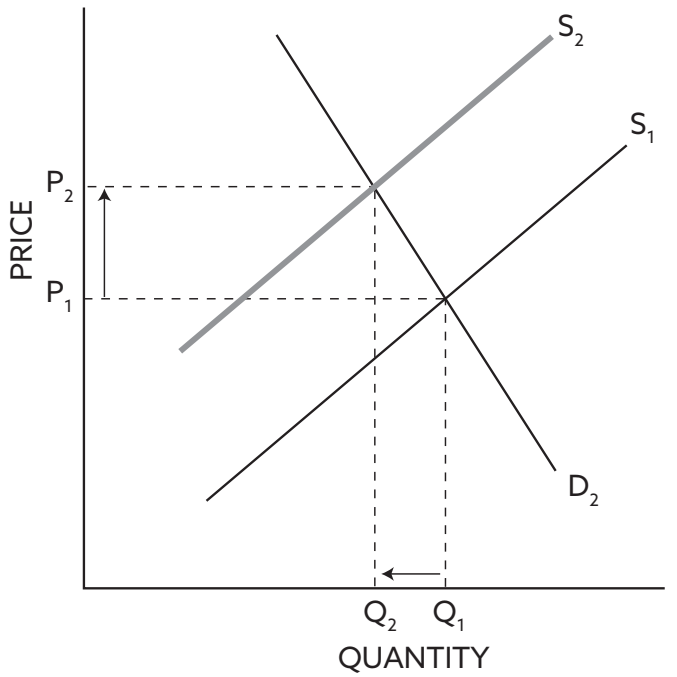
Tax Incidence and Elasticity of Demand

The more inelastic the demand for a good, the more the incident of an excise tax can be shifted to the consumer.





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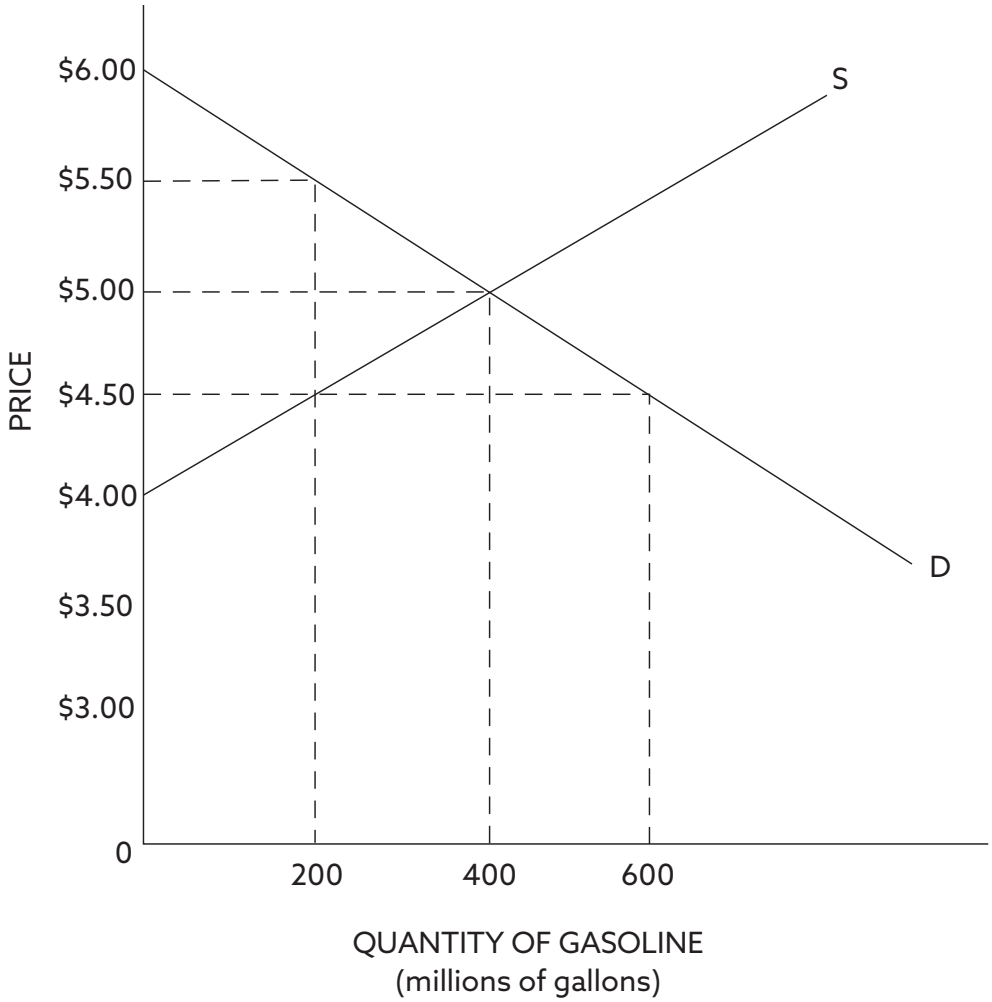
Deadweight Loss of a Price Ceiling

The Market of Gasoline



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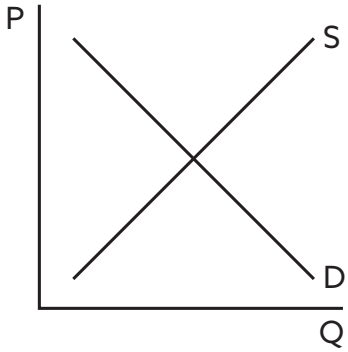

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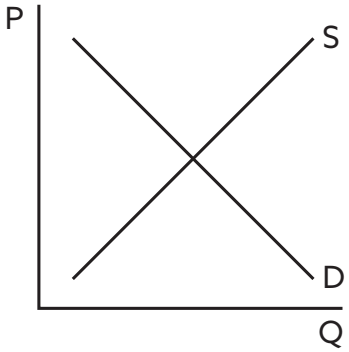

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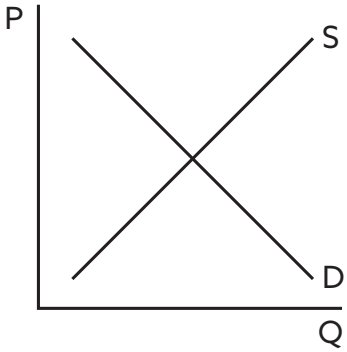

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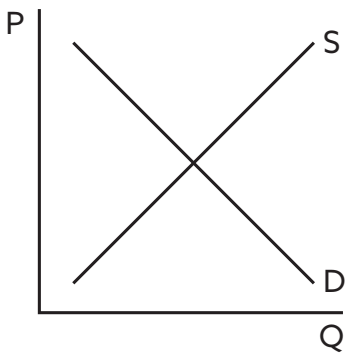

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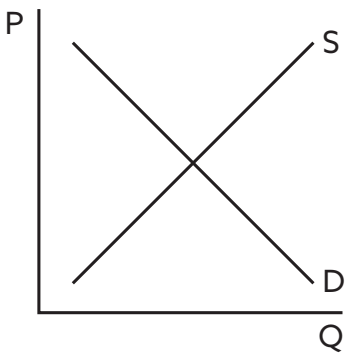

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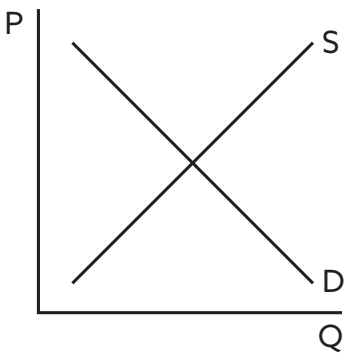

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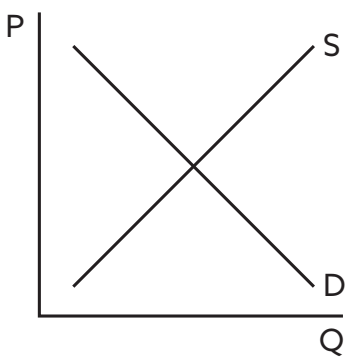

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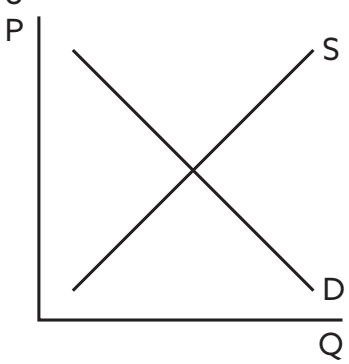
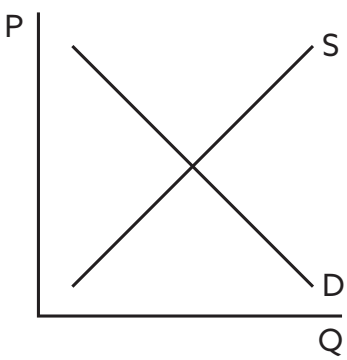
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