

## **CHAPTER TWO**

# **Demand and Supply: An Introduction**

### **Overview Comments**

This chapter covers one of the most important subjects in economics. We feel that the amount of time, effort, and patience put into developing the basic principles of demand and supply will pay great dividends for students later in the course. Also, unlike some other approaches, we have deliberately relegated the complexities of multiple curve shifts and other applications of demand and supply to another chapter.

While most of the material in this chapter is fairly standard, there are three areas which are treated a little differently from other approaches. First, we introduce the income and substitution effects early. Since we emphasize that the concept of demand involves both willingness and ability, it seemed a good opportunity to explain that the reason for the downward slope of the demand curve is that a lower price means both an increased willingness (the substitution effect) and ability (the income effect) to purchase. Second, the chapter moves deliberately and quickly to a discussion of equilibrium rather than first discussing what causes shifts in the two curves. We think this direct approach is more helpful for students who usually grasp the concept with little difficulty. Only after we have explored the idea of equilibrium and the implications of disequilibrium do we look at the determinants of demand and supply and the effects of their change. Third, we believe that it short-changes the students to show the results of a change in equilibria without explaining how the market gets there. Therefore, when we do start curve-shifting we take great pains to demonstrate just how the market moves, in reaction to surpluses and shortages, from one equilibrium to another.

Although we don't personally use algebra to teach demand and supply in our own classes, we recognize that some instructors find this an effective approach and so we have added a short Appendix on the algebra of demand and supply.

### **Suggested Approaches and Helpful Hints**

As we mentioned, we think it's essential to move to equilibrium as quickly as possible so that students are immediately made aware that the price is determined by both the demand and the supply. If this is not done you will find that you are moving curves about in isolation and showing an increase in demand which impacts on nothing: a cause looking for an effect. We find that students can grasp the concepts of equilibrium, surpluses and shortages fairly easily so we get them to this point early.

Students need to be aware that the price of the product is not always the most important factor that affects consumer spending. At times, incomes, prices of related products and so on may have more significance. Yet we put price at the forefront for two reasons. First, it often is the most important factor. Second, it is the centre of focus for our analysis because it is the one factor which links producers and consumers and which influences the actions of both groups.

It is probably useful to point out to students that some of the demand curves in this chapter are not straight lines. This is because they are plotted from data that is presented in a table. This helps to emphasize the link between a demand schedule and a demand curve and reminds us that demand and supply curves are not always linear.

One of the problems that many students have is the obvious one of confusing demand with quantity demanded (and supply with quantity supplied). The problem is only cured through repeated practice. It's a good idea to keep reminding students that the terms demand and supply do not relate to specific quantities but to whole ranges of prices and quantities. We find that while they often respond to the concept of demand, they will sometimes continue to use the term supply as a synonym for production or output.

Another problem for students is that, understandably, they draw on examples where the firm rather than the market determines the price of the product. Although we briefly mention in the text that the demand/supply model works best in the context of perfectly competitive markets, it is a shame to use only examples of commodity markets. Once students grasp the basics, they are usually eager to put the principles to work analyzing many different types of markets with which they are familiar, and these include markets which are anything but competitive and where the producers are usually price makers. We are hesitant to curb such enthusiasm so early in the game. On the other hand, you need to tread carefully when dealing with non-competitive markets. Perhaps you could explain, as we do early in Chapter 3 with the example of the over-priced automobile, that while the model works exactly as we suggest only in perfectly competitive markets, that doesn't mean that it doesn't have application to other markets.

## **Answers to Problems for Further Study**

1. **c, d** and **e** are the circled letters
2. Graph A: increase in demand; increase in quantity supplied  
Graph B: increase in supply; increase in quantity demanded
3. a) price **down** and quantity traded **down**  
b) price **up** and quantity traded **up**  
c) price **down** and quantity traded **down**

d) price **up** and quantity traded **up**

4. a) supply; increased  
 b) demand; decreased  
 c) supply; decreased  
 d) demand; increased

5. Demand refers to the whole range of quantities that are demanded at various prices as depicted by a demand schedule or demand curve. The quantity demanded refers to a particular quantity at a particular price, i.e. it is a point on a demand curve.

6. Shortages cause competitive bidding among buyers of a product. The result will be that the price will be bid up and will continue to rise until the shortage disappears.

7. **Table 2.19 (completed)**

	<b>D</b>	<b>S</b>	<b>P</b>	<b>Q</b>
a	↑	-	↑	↑
b	↑	-	↑	↑
c	-	↓	↑	↓
d	↓	-	↓	↓
e	↓	-	↓	↓
f	↑	-	↑	↑

8. Change the second sentence to: “The **quantity demanded** for houses decreases when the price increases.”

9. The first determinant of market demand is consumer preferences, i.e. the tastes and fashions of consumer. The second is consumer incomes. For a normal product, higher incomes leads to a higher demand; on the other hand, for an inferior product higher incomes lead to a lower demand. The third determinant is the prices of related products, which include substitute products, and complementary products. The demand will be higher if the price of a substitute increases or the price of a complement decreases. The fourth determinant is expectations of the future. The demand will increase if future prices or incomes are expected to be higher or a future shortage is anticipated. The final determinant is the population. The market demand for a product may be affected if there is a change in the size or in the income or age distribution of the population.

10. An increase in the demand for a product will initially lead to a shortage. As a result competition among the buyers will cause the price to increase. The effect of an increase in the price will be a fall in the quantity demanded and an increase in the quantity supplied. Both factors will help to eliminate the shortage. Eventually both the price and the quantity traded of the product will have increased.

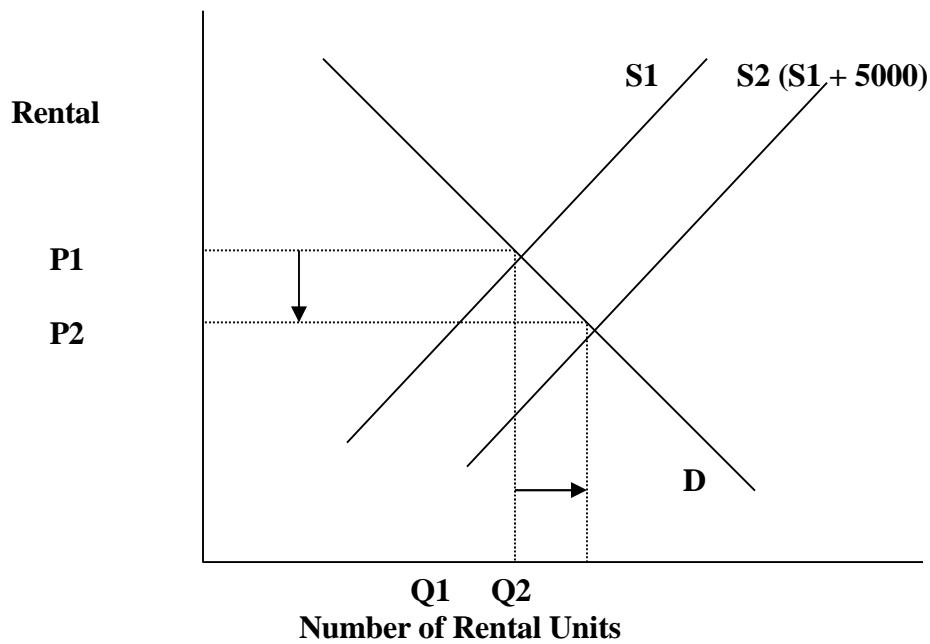
11. Five possible causes are:

- an increase in the price of resources used;
- an increase in business taxes;
- an increase in the price of a substitute in production;
- the expectation of suppliers that there will be higher prices in the future;
- a decrease in the number of suppliers.

Five specific effects (in order) are:

- a shortage;
- a price increase;
- an increase in the quantity supplied;
- a decrease in quantity demanded;
- a decrease in the quantity traded.

12.



## APPENDIX TO CHAPTER TWO

### Answers to Problems for Further Study

1.  $P = 6$ ;                       $Q = 28$ .

2. a)  $P = 15$ ;                       $Q = 25$ .

b) Shortage of 12.

- c)  $P = 17$ ;             $Q = 27$ .
- 3.** a)  $Q^d = 244 - 4P$
- b)  $Q^s = -8 + \frac{1}{2}P$
- c)  $P = 56$ ;             $Q = 20$
- 4.** a)  $Q^d = 675 - 100P$  (or  $P = 6.75 - 0.01Q^d$ ).
- b)  $Q^s = 50P$  (or  $P = 0.02Q^s$ )
- c)  $P = 4.5$ ;             $Q = 225$
- 5.** a) shortage of 60. ( $Q^d = 185$ ;  $Q^s = 125$ )
- b) surplus of 24. ( $Q^d = 164$ ;  $Q^s = 188$ )
- 6.** a)  $P = 70$ . (Solve the equation:  $380 = 100 + 4P$ )
- b)  $Q^d = 310$ . (Plug 70 into the demand equation.)
- c) Surplus of 70. ( $Q^d = 310$  and  $Q^s = 380$ ).



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Eighth Edition

CHAPTER 2

# Demand and Supply: an Introduction

Stephen Mullins, St. Clair College



## CHAPTER 2

# Demand and Supply: an Introduction

### **Learning Objectives:**

1. Explain the concept of demand
2. Explain the concept of supply
3. Explain the term market
4. Explain the concept of equilibrium



## CHAPTER 2

# Demand and Supply: an Introduction

### **Learning Objectives:**

5. Demonstrate the causes and effects of a change in demand
6. Demonstrate the causes and effects of a change in supply
7. Explain why demand and supply determine price and quantity traded



# Demand

## Demand

- The quantities that consumers are willing and able to buy over a period of time at various prices

# Demand

## Demand

- The quantities that consumers are **willing** and **able** to buy over a period of time at various prices
  - Must be willing to purchase it  
AND
  - Must have ability to pay for it

# Demand

## Demand

- The quantities that consumers are willing and able to buy over a **period of time** at various prices
- Measures quantities in a specific time period, e.g. a week / month / year

# Demand

## Demand

- The quantities that consumers are willing and able to buy over a period of time at **various prices**
  - Shows relationship between quantity & price
  - Price is the most important determinant
    - “Ceteris paribus” – all else remains the same

# Demand

## Demand Schedule

- A table showing the various quantities demanded at different prices

## Demand Curve

- A graphic representation of a demand schedule

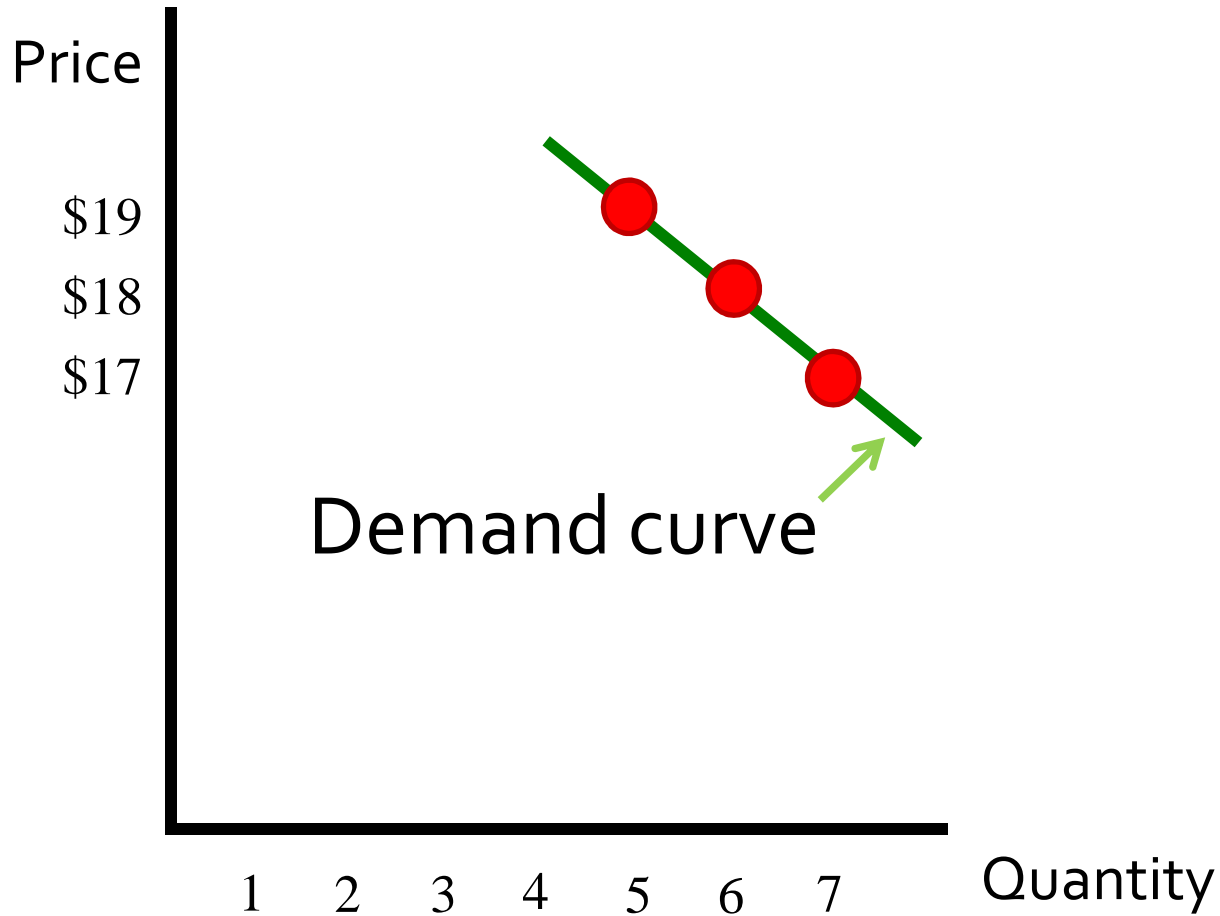
# Demand Schedule

<b>Price Per Case</b>	<b>Quantity Demanded (cases per month)</b>
<b>\$17</b>	<b>7</b>
<b>18</b>	<b>6</b>
<b>19</b>	<b>5</b>
<b>20</b>	<b>4</b>
<b>21</b>	<b>3</b>
<b>22</b>	<b>2</b>

# Demand Curve



# Demand Curve

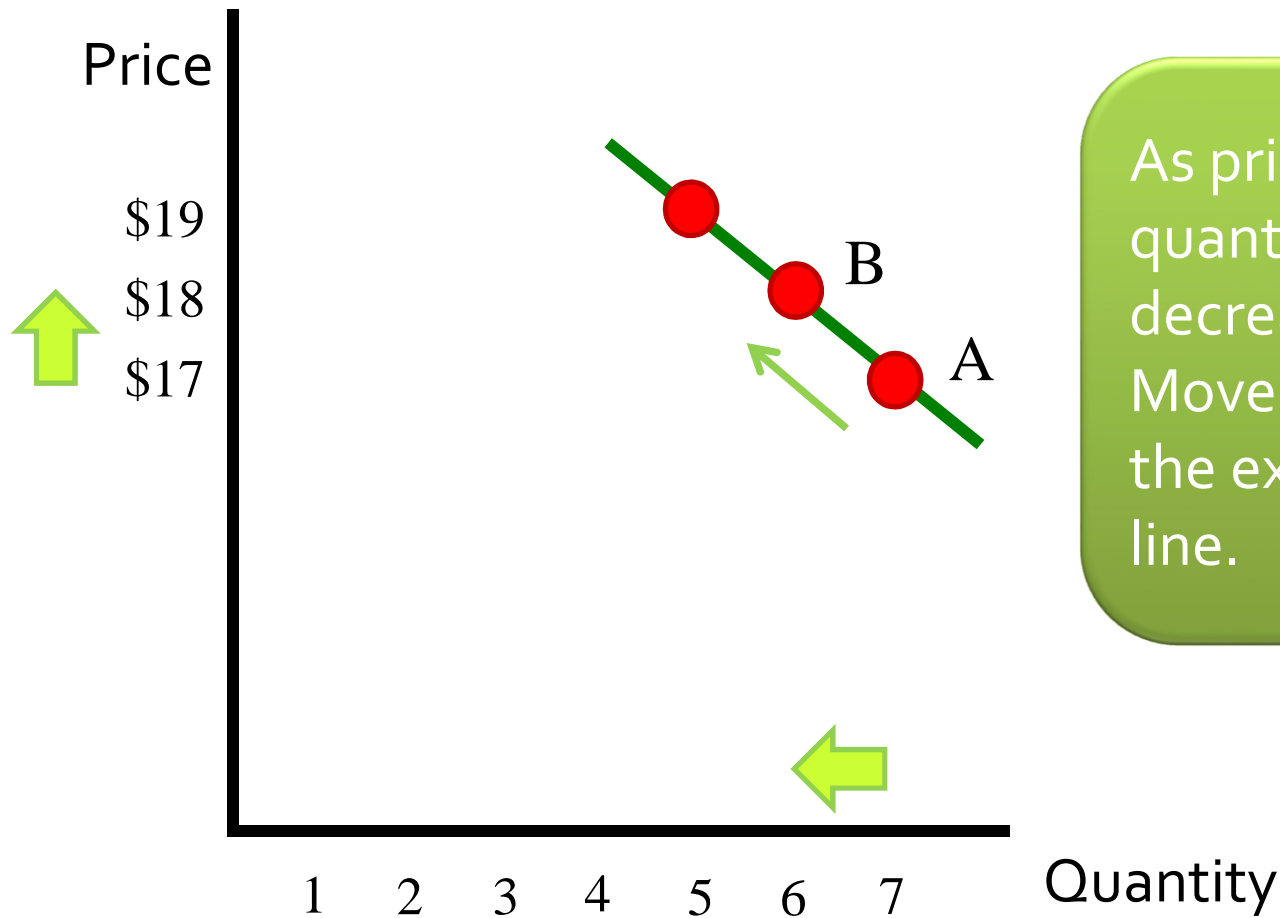




# Demand Curve



# Demand Curve



As price increases, quantity demanded decreases. Movement is along the existing demand line.

# Why the Demand Curve Slopes Downward

## 1. Income effect

- The effect of a price change on real income, and therefore on quantity demanded
- **Real income** is measured in terms of the goods and services it will buy
- Real income will increase if prices fall

# Why the Demand Curve Slopes Downward

## 2. Substitution effect

- The substitution of one product for another as a result of a change in their relative prices

# Market Demand

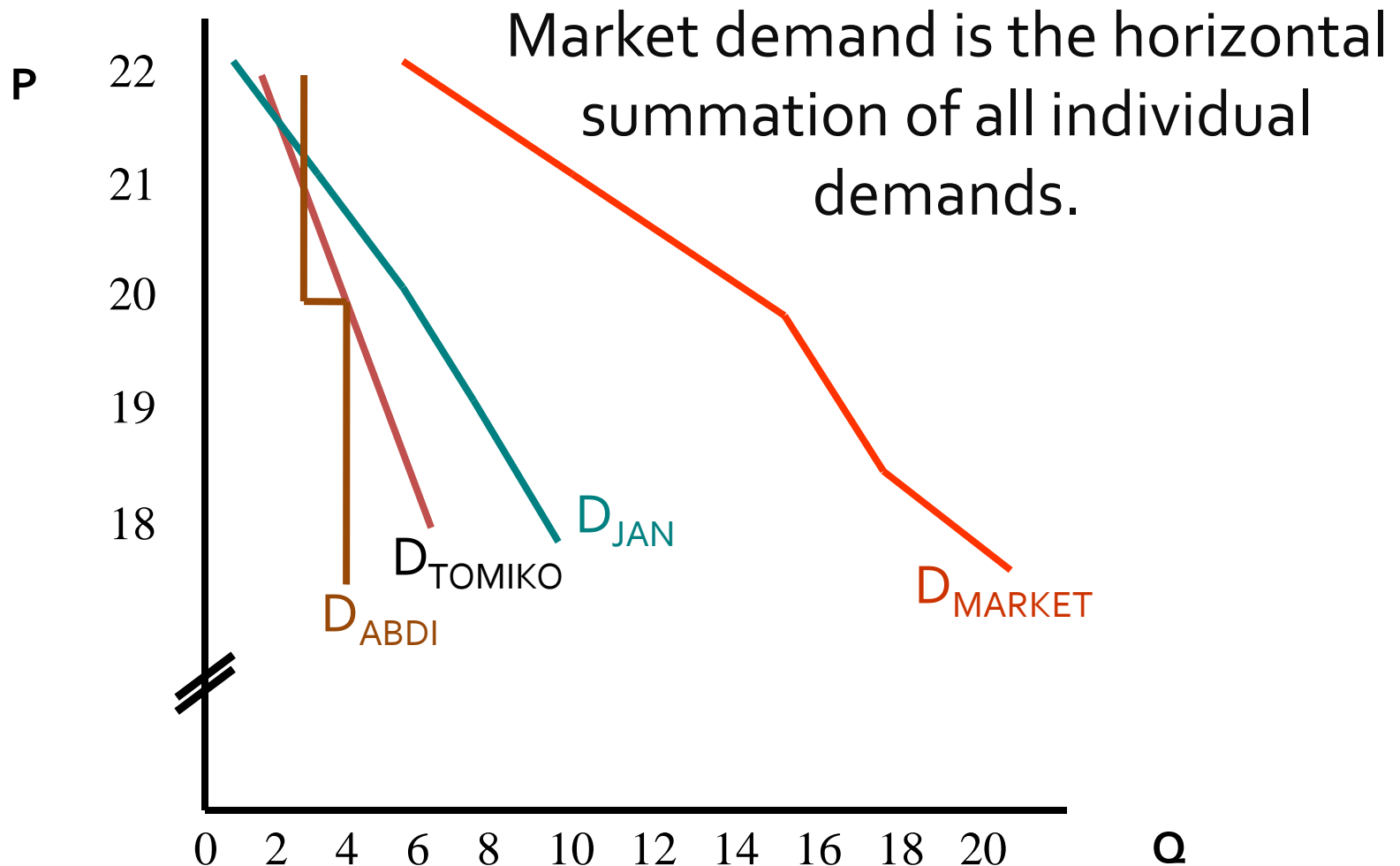
## Market Demand

- The total demand for a product or service from all consumers

# Market Demand Schedule

	Quantity demanded (cases/month)			
\$/case	Tomiko	Abdi	Jan	Market demand
\$18	6	+ 4	+ 9	= 19
\$19	5	4	7	16
\$20	4	4	6	14
\$21	3	3	3	9
\$22	2	3	1	6

# Market Demand Schedule



# Test Your Understanding

The table shows the weekly demand for soy milk by three people in a very small market.

a. Calculate market demand at each price.

Price	Quantity demanded by:			
	Al	Bo	Cole	Market
\$4.00	1	+ 0	+ 0	= 1
3.50	1	1	0	2
3.00	1	1	1	3
2.50	2	1	1	4
2.00	2	2	1	5



# Supply

## Supply

- The quantities that producers are willing and able to supply over a period of time at various prices

# Supply

## Supply Schedule

- A table showing the various quantities supplied per period of time at different prices

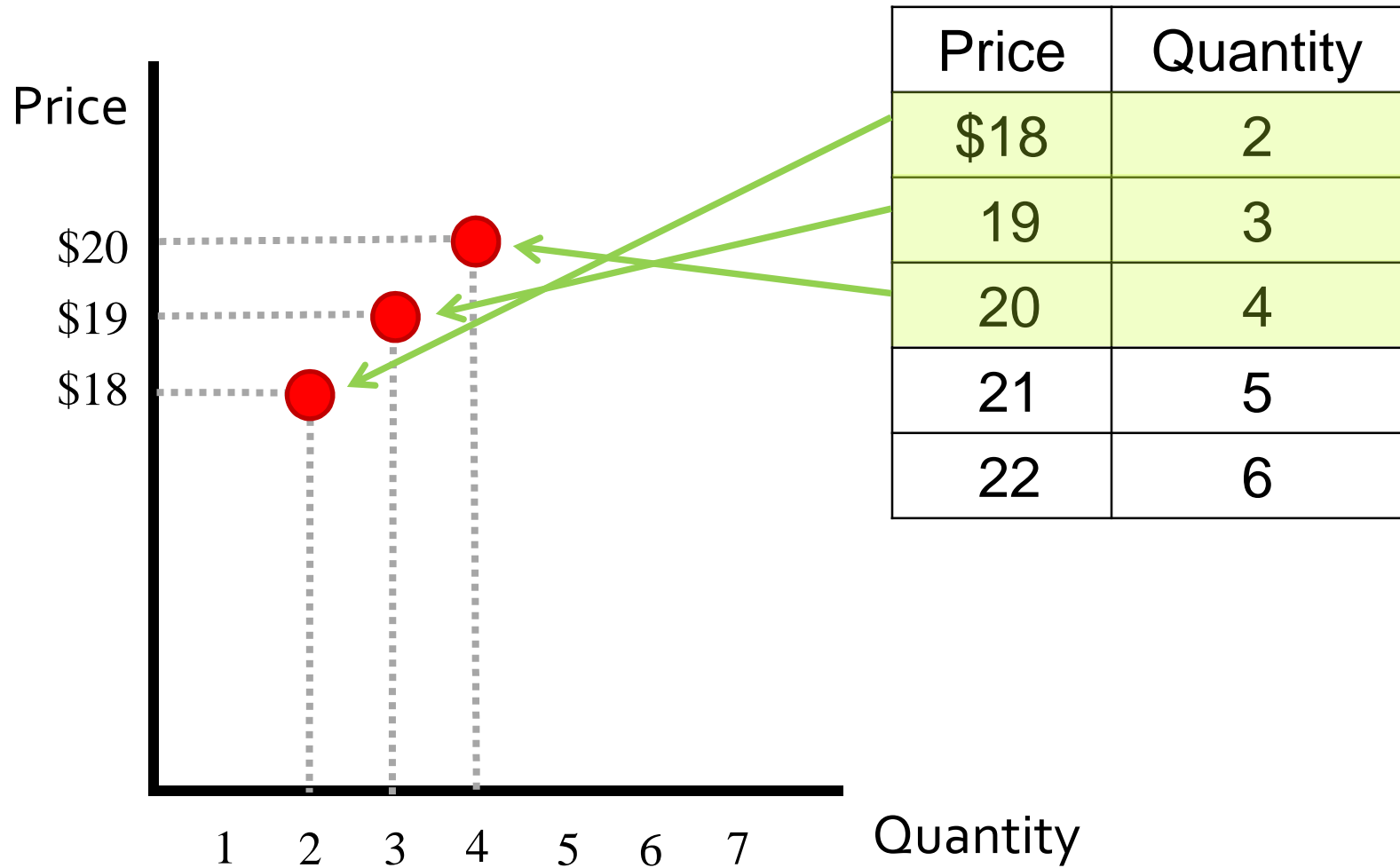
## Supply Curve

- A graphic representation of the supply schedule

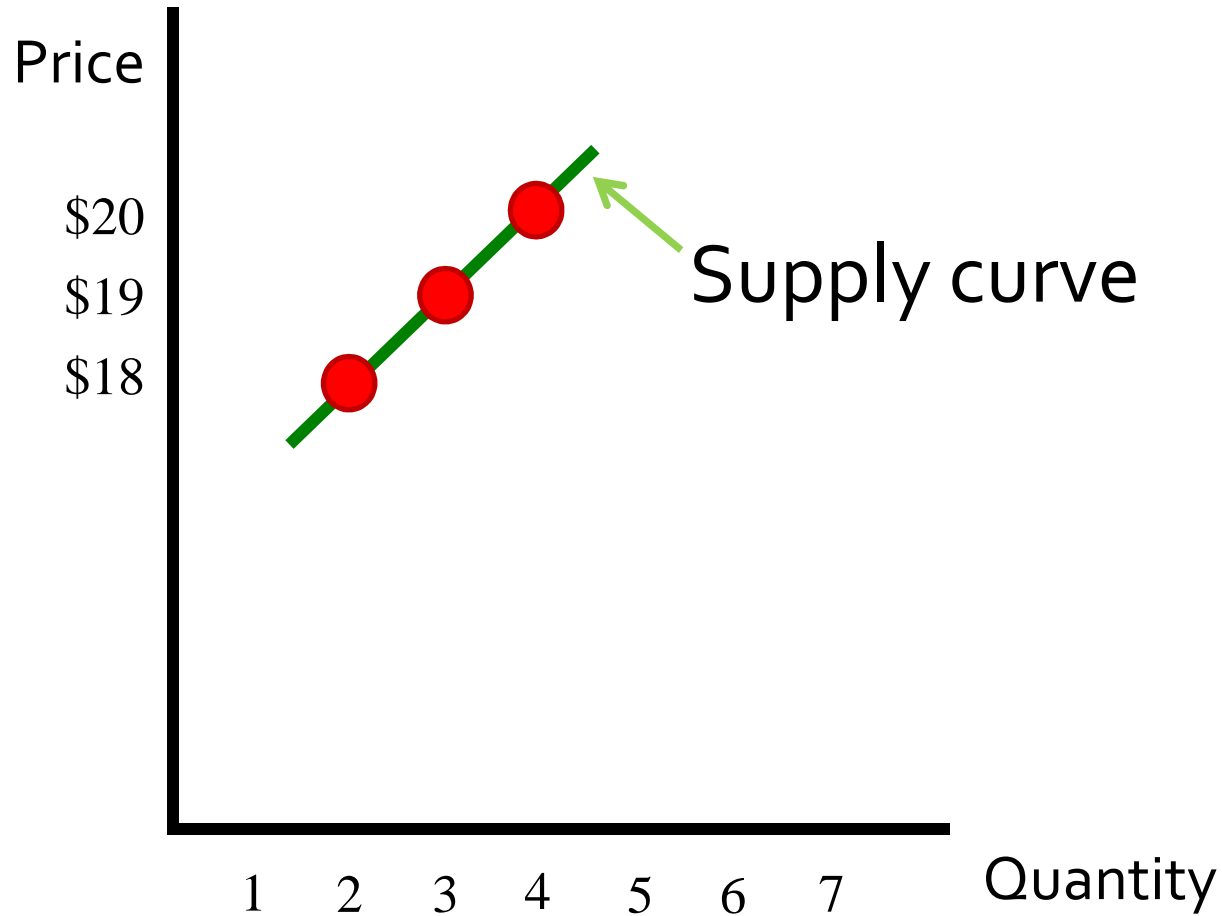
# Supply Schedule

<b>Price Per Case</b>	<b>Quantity Supplied (cases per month)</b>
<b>\$18</b>	<b>2</b>
<b>19</b>	<b>3</b>
<b>20</b>	<b>4</b>
<b>21</b>	<b>5</b>
<b>22</b>	<b>6</b>

# Supply Curve



# Supply Curve



# Supply Curve



As price increases, quantity supplied ( $Q_s$ ) increases. Movement is along the existing supply line.

# Why the Supply Curve Slopes Upward

- Suppliers are motivated by profit
- Higher price means more profit, more suppliers are willing to produce the product
- Costs rise as more is produced, so higher prices are required to supply more

# Market Supply Curve

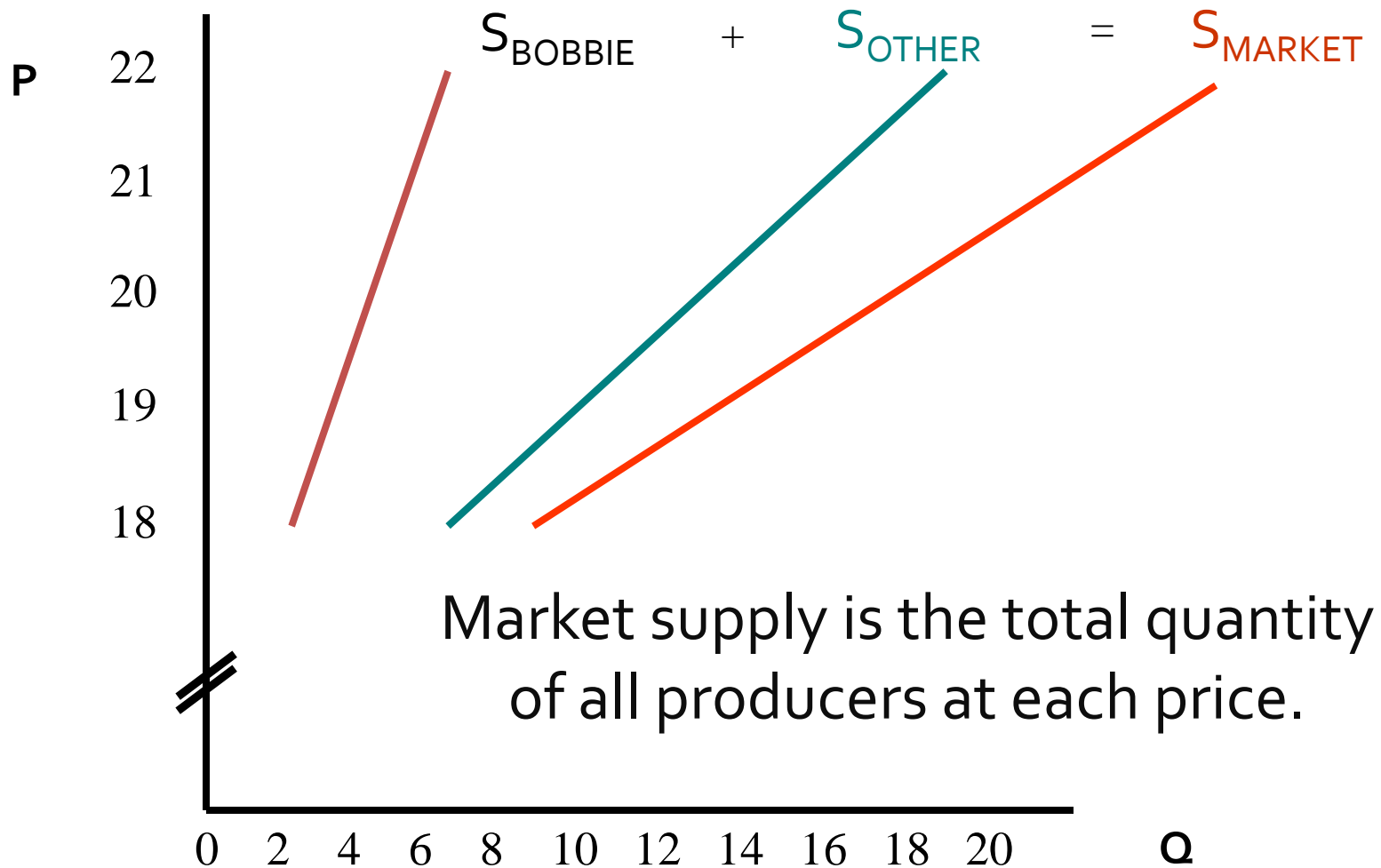
- Total supply from all producers of a product
- Horizontal summation of each individual producer's supply curve
- **Assumptions:**
  - Producers are all making a similar product
  - Consumers have no preference as to which supplier or product they use



# Market Supply Schedule

	Quantity supplied (cases/month)		
<b>\$/case</b>	<b>Bobbie</b>	<b>Other Brewers</b>	<b>Market Supply</b>
<b>\$18</b>	<b>2</b>	<b>+ 6</b>	<b>= 8</b>
<b>\$19</b>	<b>3</b>	<b>9</b>	<b>12</b>
<b>\$20</b>	<b>4</b>	<b>12</b>	<b>16</b>
<b>\$21</b>	<b>5</b>	<b>15</b>	<b>20</b>
<b>\$22</b>	<b>6</b>	<b>18</b>	<b>24</b>

# Market Supply Curve



# Market Equilibrium

## Market

- A mechanism that allows buyers and sellers to exchange products or services

## Equilibrium

- The point where quantity demanded equals quantity supplied
- There is neither a shortage nor a surplus

$$Q_D = Q_S$$

# Market Equilibrium

## Surplus

- The amount by which quantity supplied is **greater** than quantity demanded
- Occurs at **prices above equilibrium**

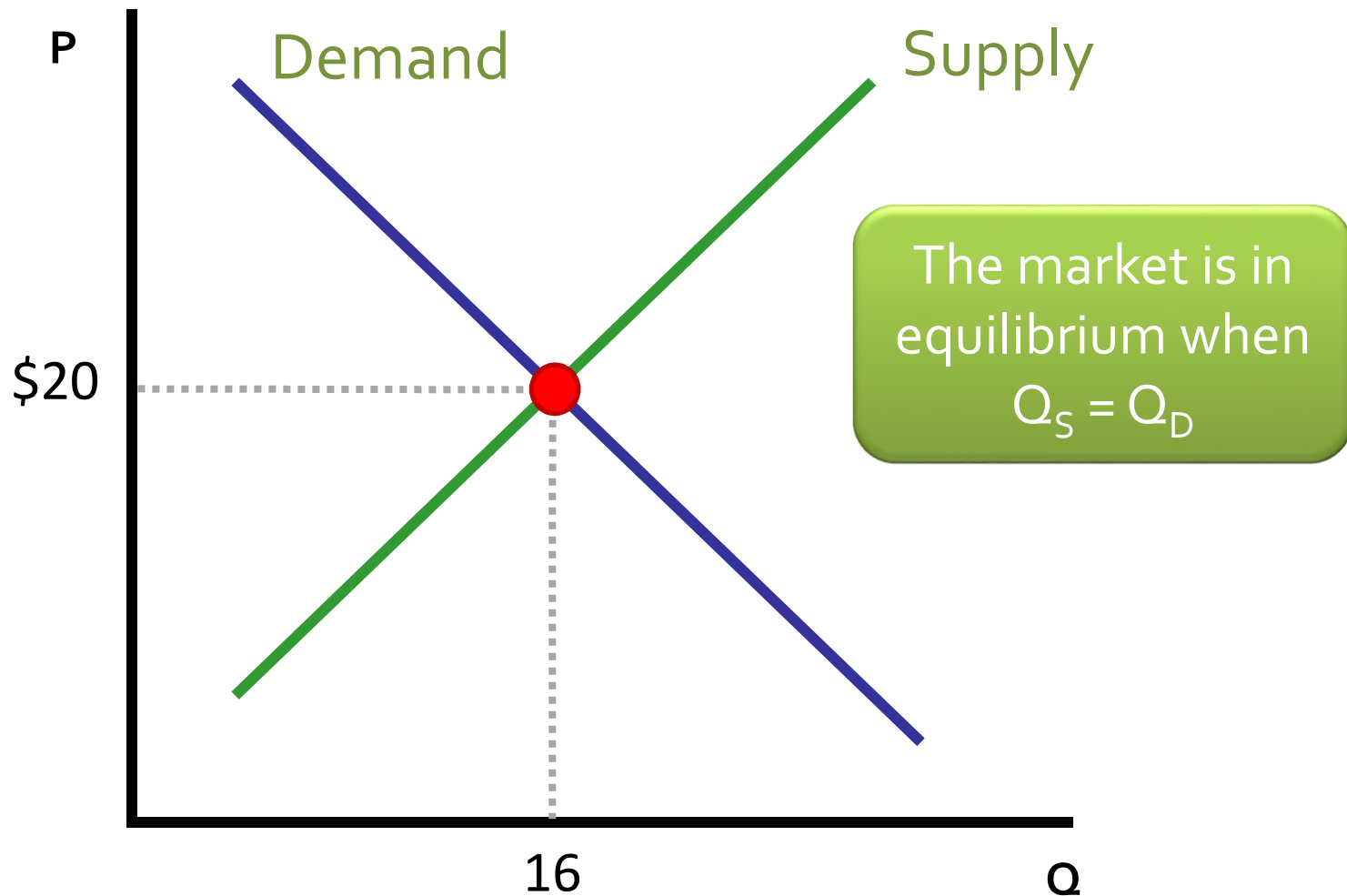
## Shortage

- The amount by which quantity supplied is **less** than quantity demanded
- Occurs at **prices below equilibrium**

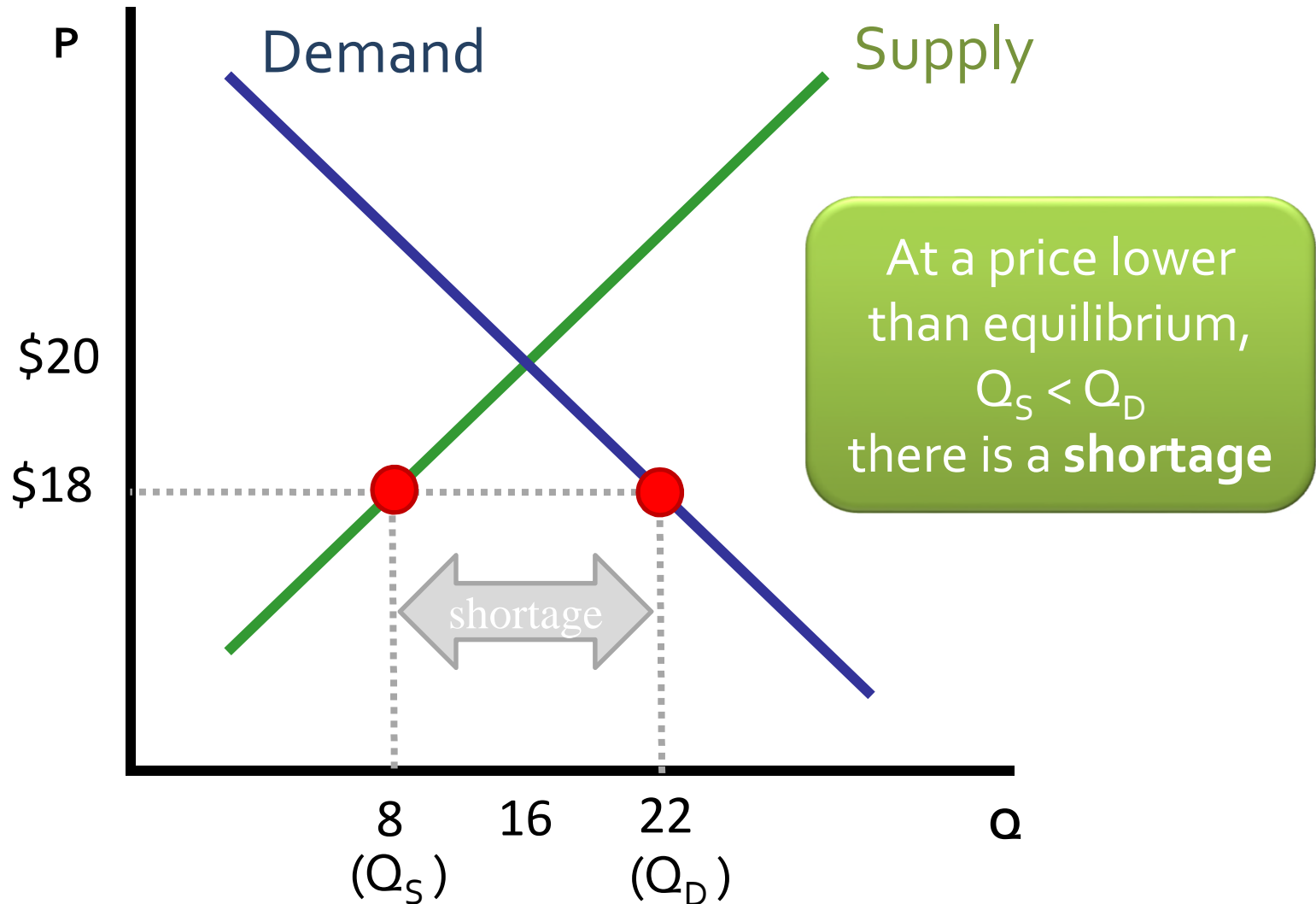
# Market Equilibrium

	Quantity supplied (cases/month)		
\$/case	Market Supply	Market Demand	Shortage/ Surplus
\$18	8	- 22	= -14
\$19	12	18	- 6
\$20	16	16	0
\$21	20	9	+11
\$22	24	6	+18

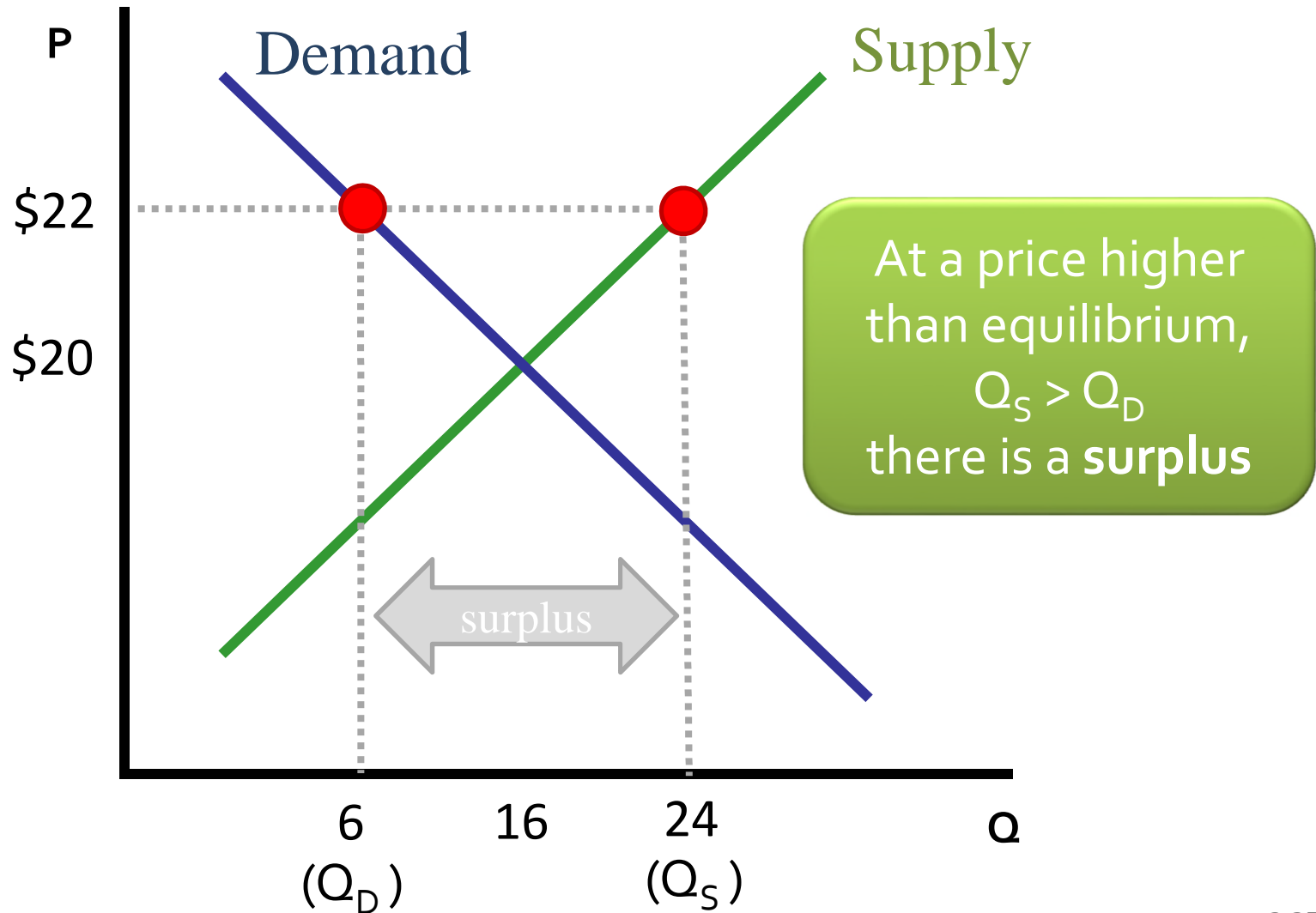
# Market Equilibrium



# Shortage



# Surplus





# Test Your Understanding

The table shows demand and supply for a product. Calculate the surplus or shortage at each price.

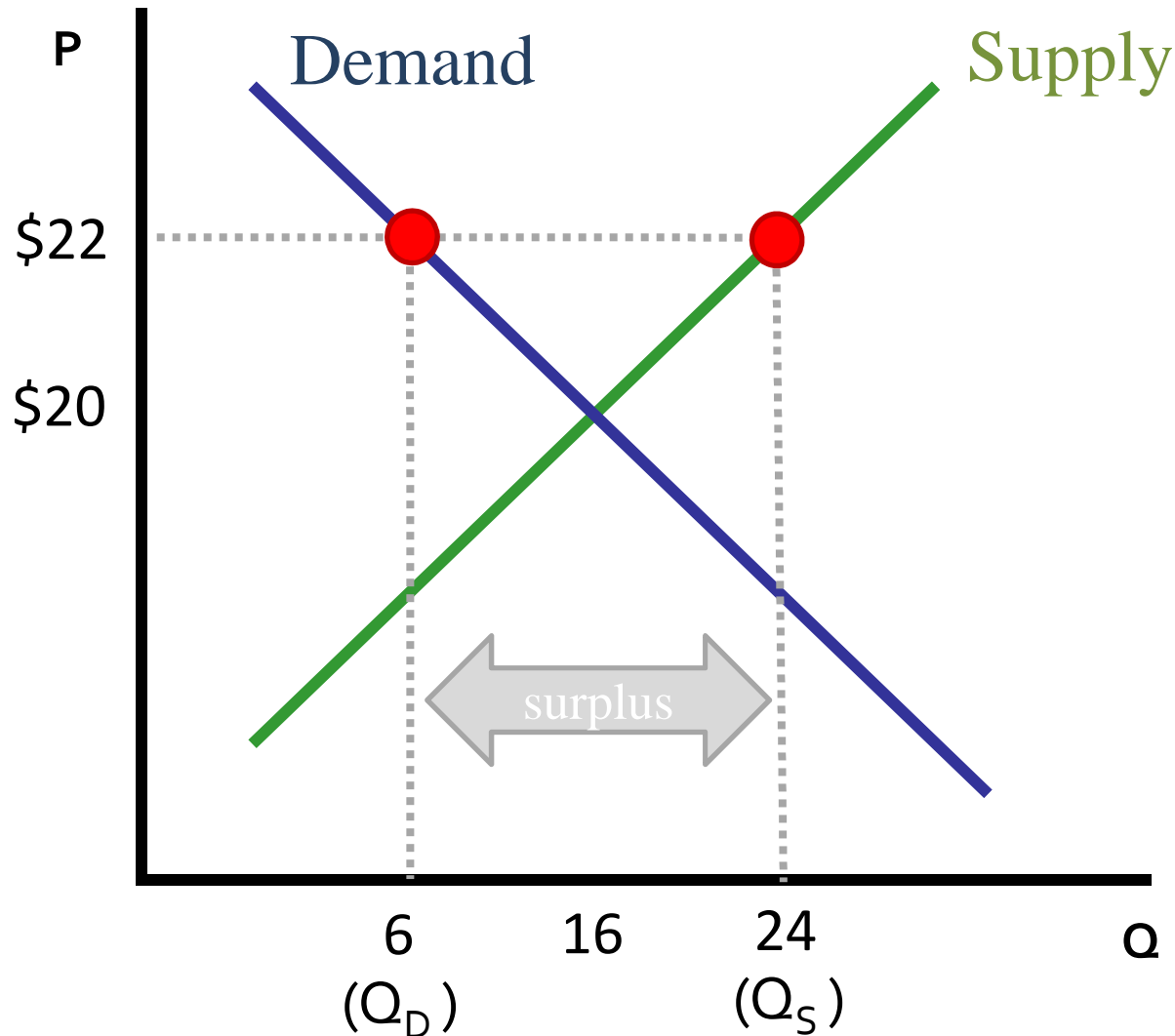
Price	Demand	Supply	Surplus/ Shortage
\$2.00	60	30	- 30
2.50	56	36	- 20
3.00	52	42	- 10
3.50	48	48	0 ← equilibrium
4.00	44	54	+ 10

# Market Adjustments

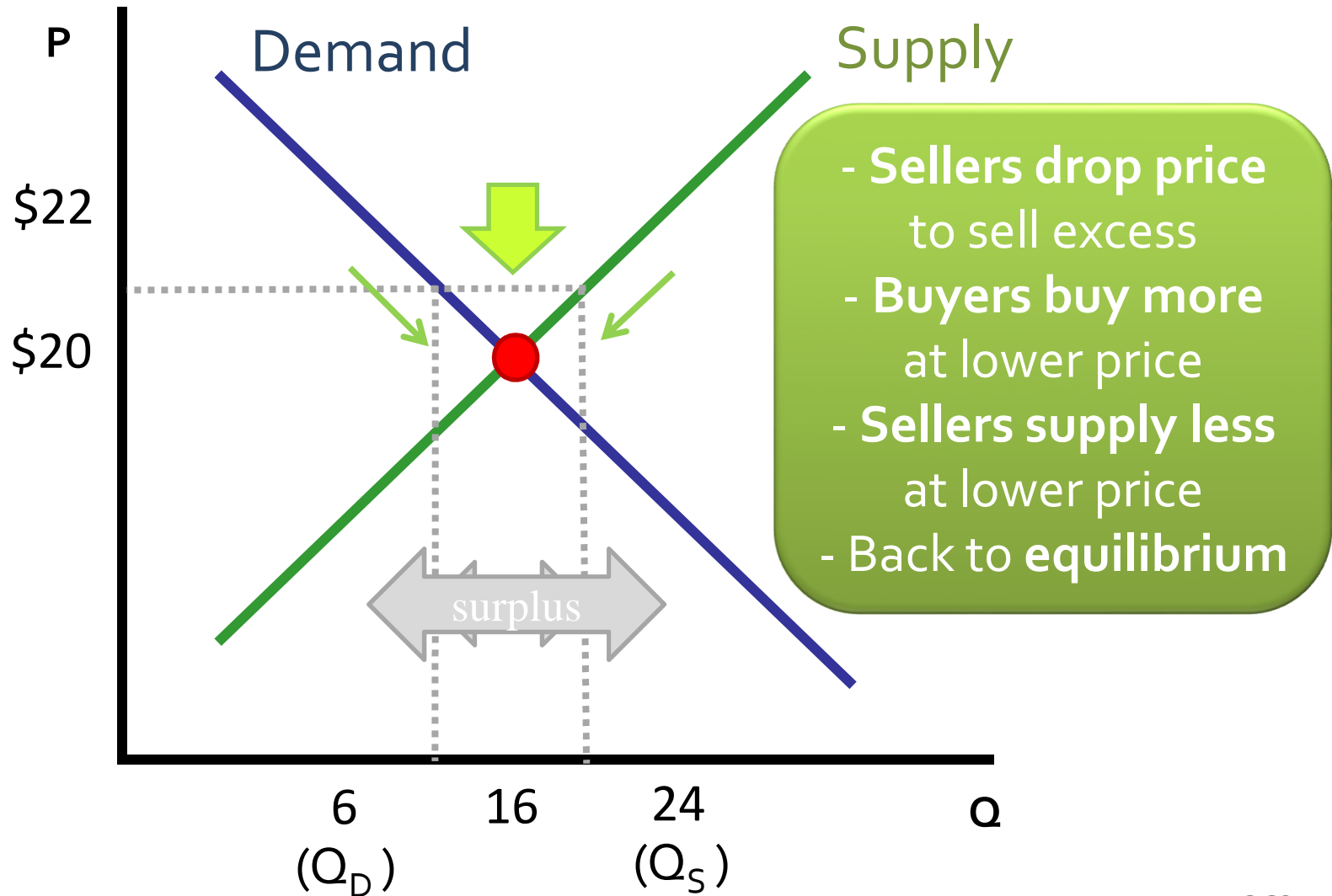
## When there is a Surplus:

- Producers drop the price to sell excess stock
- As price drops:
  - quantity demanded increases
  - quantity supplied falls
- Market moves back to equilibrium price, quantity

# Market Adjustment - Surplus



# Market Adjustment - Surplus

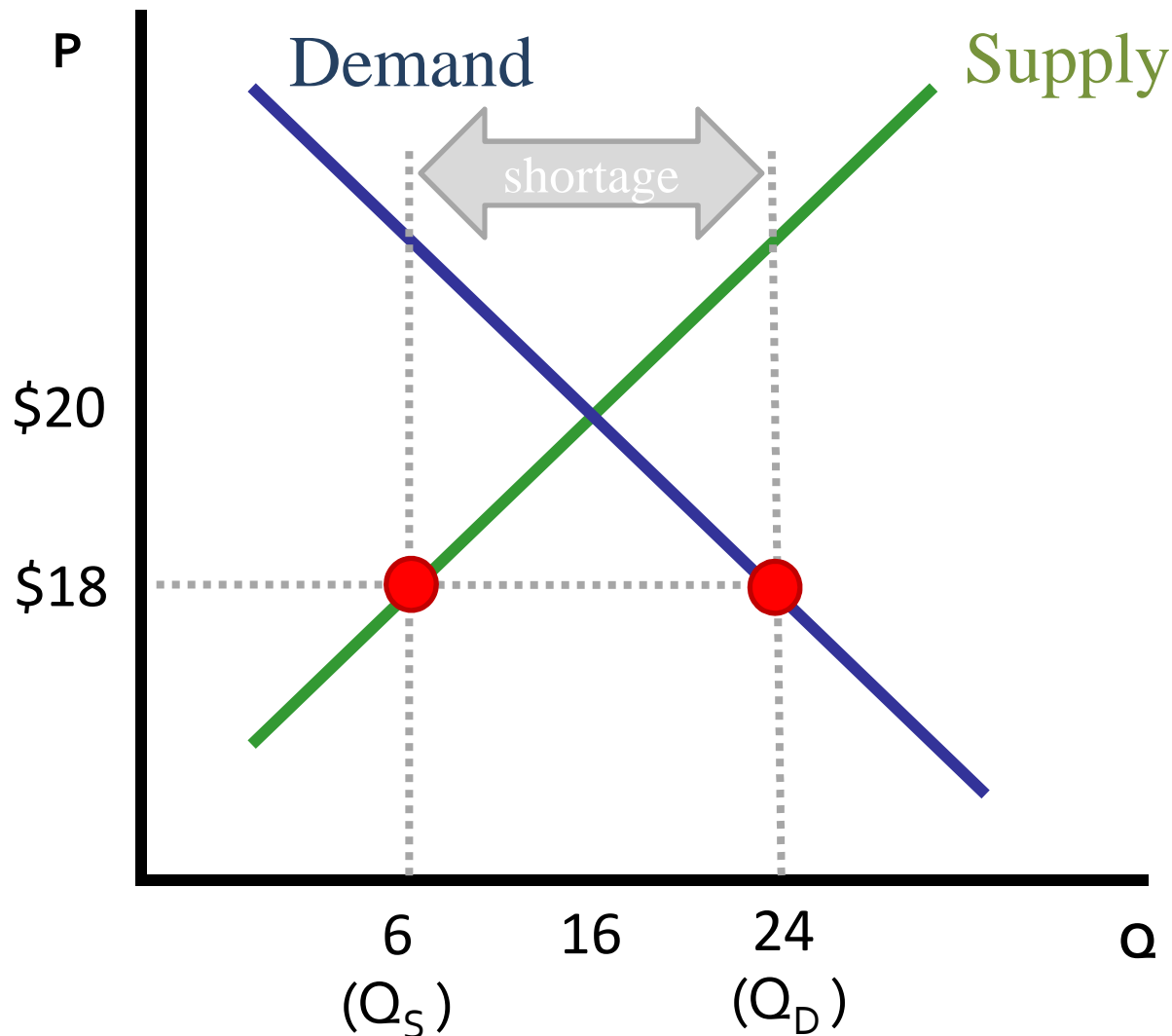


# Market Adjustments

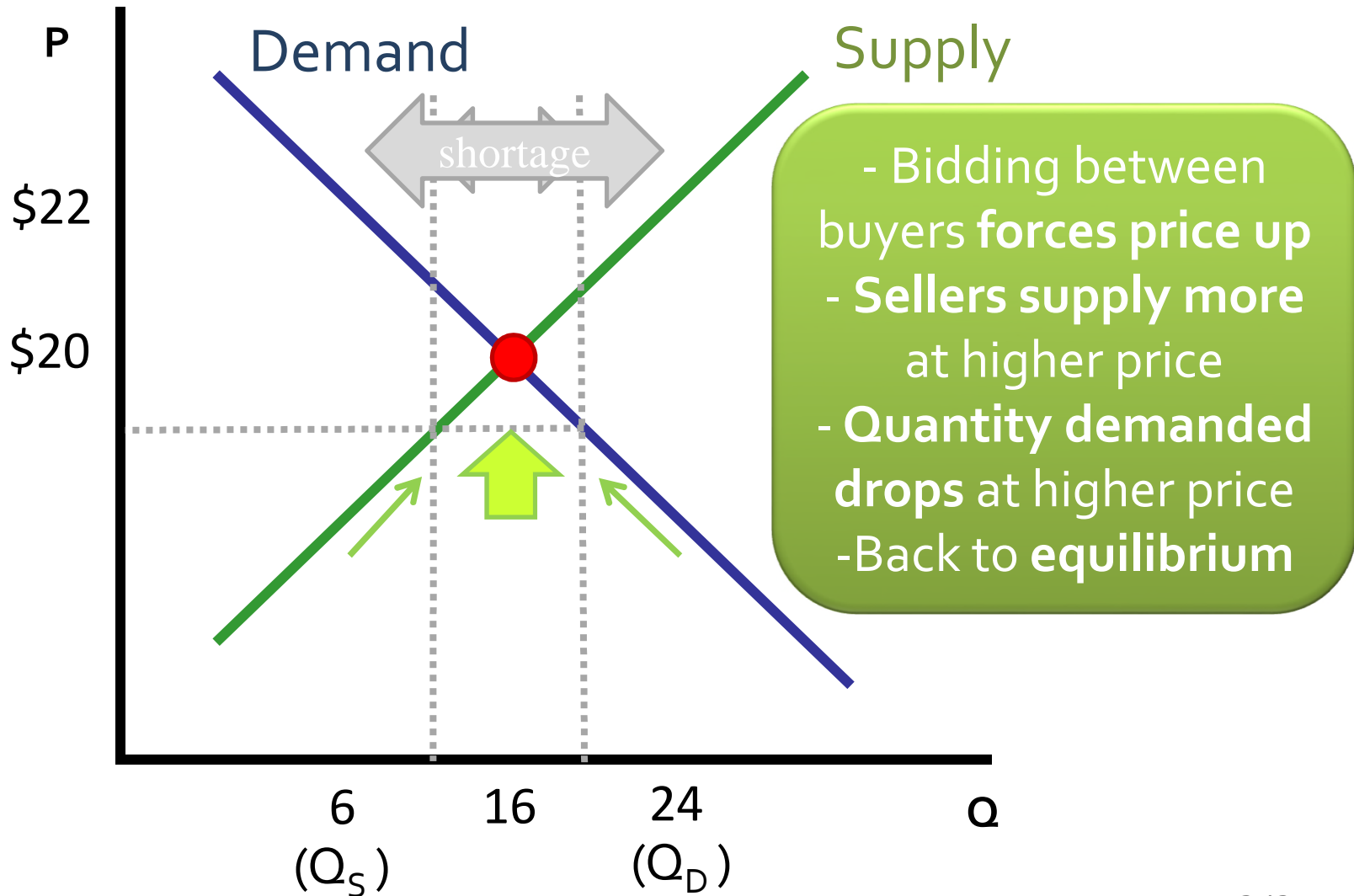
## When there is a Shortage:

- Buyers bid up the price
- As price rises:
  - quantity demanded decreases
  - quantity supplied increases
- Market moves back to equilibrium price, quantity

# Market Adjustment - Shortage



# Market Adjustment - Shortage



# Increase in Demand





# Determinants of Demand

## 1. Consumer preferences

- If tastes change, demand changes

## 2. Consumer incomes

- **Normal Products:** buy more when income rises, less when income falls
- **Inferior Products:** buy more when income falls, less when income rises

# Determinants of Demand

## 3. Prices of Related Products:

- Products are related if a change in the price of one product causes a change in demand for the other product
- Two types of related products:
  - Substitutes
  - Complements

# Determinants of Demand

## 3. Prices of Related Products:

### – Substitute Product:

- Similar products that can be substituted for each other
- Increase in price of one product causes increased demand for the related product

# Determinants of Demand

## 3. Prices of Related Products:

### – Complementary Product:

- Tend to be bought together
- Increase in price of one product causes a decrease in demand for related product

# Determinants of Demand

- 4. Expectations of future prices, income, availability**
  - If prices or incomes expected to rise, consumers buy more now
  - If goods expected to be scarcer, buy more now
  
- 5. Population size, or income and age distribution**
  - Increases in population or incomes cause increase in demand
  - Changes in age distribution affect demand

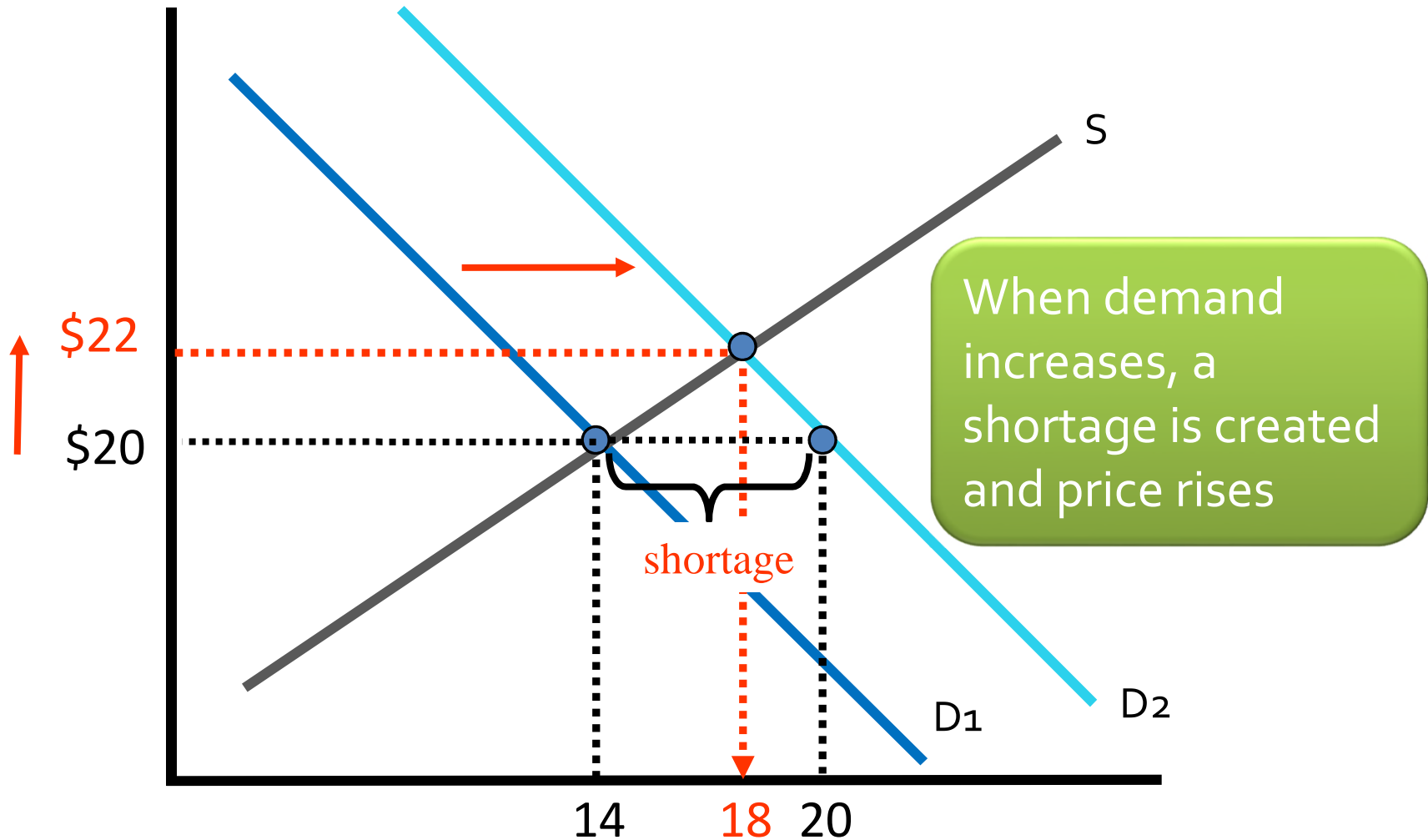
# Test Your Understanding

Price	Demand ( $D_1$ )	Demand ( $D_2$ )
\$2.00	10 000	11 000
3.00	9 600	10 600
4.00	9 200	10 200

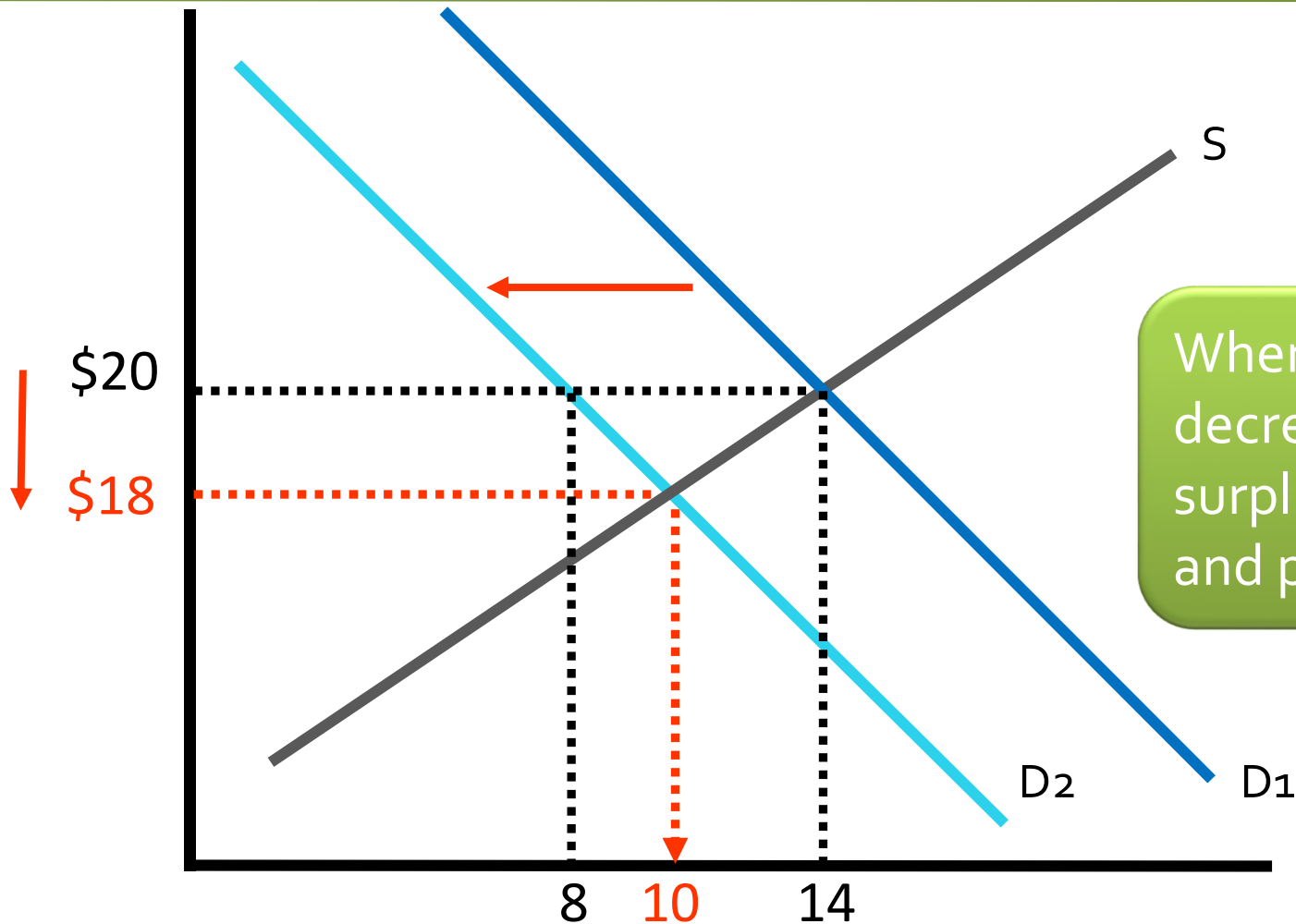
In the above market for pretzels:

- What might have happened to the price of a complementary product, like beer, to cause the demand for pretzels to change?  
Price of beer fell
- What might have happened to the price of a substitute product, like nuts?  
Price of nuts rose

# Adjustment to an Increase in Demand



# Adjustment to a Decrease in Demand



When demand decreases, a surplus is created and price drops



# Test Your Understanding

What effect will the following changes have upon

(i) the demand for,

(ii) the price, and

(iii) the quantity traded of commercially brewed beer?

- A new medical report praising the healthy effects of drinking beer  $D \uparrow$   $P \uparrow$   $Q \uparrow$
- A decrease in the price of home-brewing kits  $D \downarrow$   $P \downarrow$   $Q \downarrow$
- A rapid increase in population growth  $D \uparrow$   $P \uparrow$   $Q \uparrow$
- Talk of a future strike of brewery workers  $D \uparrow$   $P \uparrow$   $Q \uparrow$
- A possible future recession  $D \downarrow$   $P \downarrow$   $Q \downarrow$

# Determinants of Supply

## 1. Prices of Productive Resources

- If the price of a productive resource increases, firms will supply less

## 2. Business Taxes

- If business taxes rise, firms will supply less

## 3. Technology

- An improvement in technology leads to a fall in the cost of production and an increase in supply

# Determinants of Supply

## 4. Prices of Substitutes in Production

- An increase in the price of one product will cause a drop in the supply of products that are substitutes in production

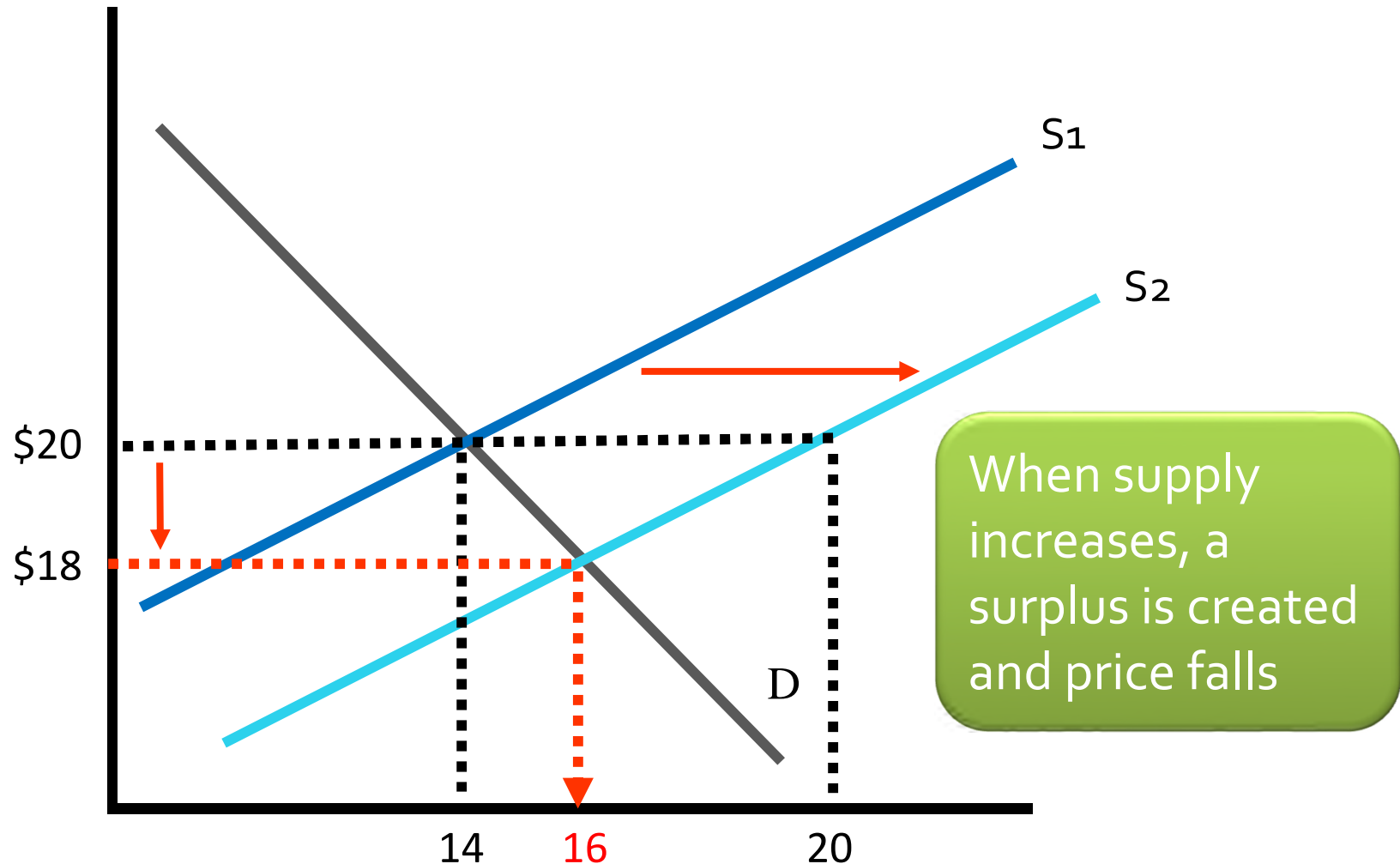
## 5. Future Expectation of Suppliers

- Lower expected future prices will lead to an increase in supply

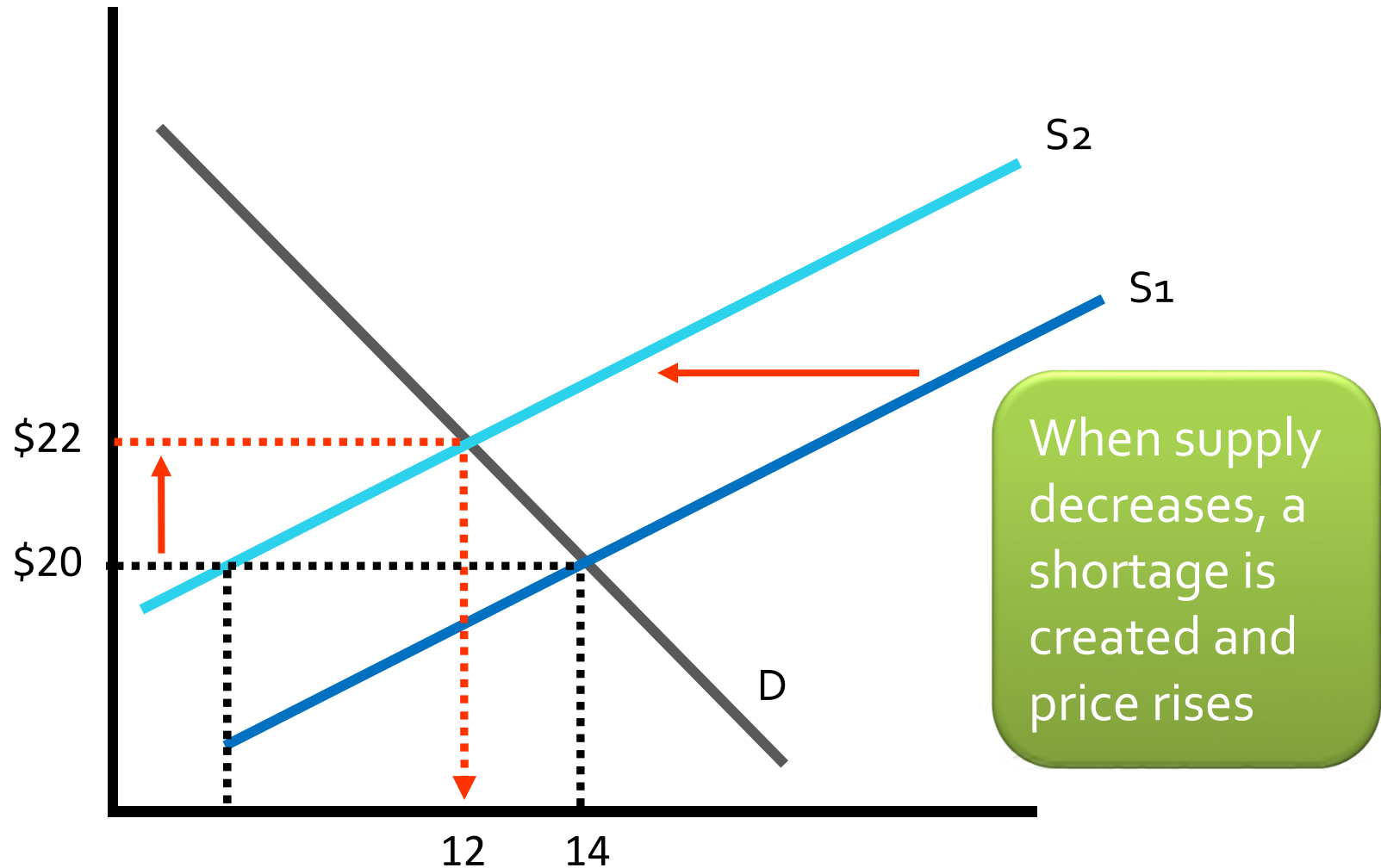
## 6. Number of Suppliers

- A decrease in the number of suppliers will reduce market supply

# Effects of an Increase in Supply



# Effects of a Decrease In Supply



# Test Your Understanding

Price	Demand	Supply 1	Supply 2
\$4.00	140	60	90
4.25	130	70	105
4.50	120	80	120
4.75	110	90	135
5.00	100	100	150
5.25	90	110	165
5.50	80	120	180

- What are equilibrium price and quantity?
- Supply increases by 50% - what are the new equilibrium price and quantity?

# Test Your Understanding

What effect will the following have on supply, price and quantity traded of wine?

- a. A poor harvest in the grape industry results in a big decrease in the supply of grapes  $S \downarrow$   $P \uparrow$   $Q \downarrow$
- b. The number of wineries increases  $S \uparrow$   $P \downarrow$   $Q \uparrow$
- c. The sales tax on wine increases  $S \downarrow$   $P \uparrow$   $Q \downarrow$
- d. A new fermentation method reduces the time needed for the wine to ferment  $S \uparrow$   $P \downarrow$   $Q \uparrow$
- e. The gov't introduces a subsidy for each bottle of wine produced domestically  $S \uparrow$   $P \downarrow$   $Q \uparrow$
- f. The gov't introduces a quota limiting the amount of foreign-made wine entering Canada  $S \downarrow$   $P \uparrow$   $Q \downarrow$

# Final Words

**Demand and supply determine price and quantity (not the reverse)**

A change in		causes a	which causes	
		(shortage/surplus?)	(P up/down?)	(Q up/down?)
Demand	↑	shortage	P ↑	Q ↑
Supply	↓	shortage	P ↑	Q ↓
Demand	↓	surplus	P ↓	Q ↓
Supply	↑	surplus	P ↓	Q ↑



## Key Concepts to Remember:

1. The difference between demand vs. quantity demanded
2. The difference between supply vs. quantity supplied
3. The term “market”
4. The concept of equilibrium price and quantity
5. The determinants of demand and supply
6. The effects of a change in demand or a change in supply
7. Why demand and supply determine price and quantity, not the reverse