

## How to Study for Class 4: The Determinants of Demand and Supply

Chapter 4 introduces the factors that will shift the shift plus two new elasticity concepts.

1. Begin by looking over the Objectives listed below. This will tell you the main points you should be looking for as you read the chapter.
2. New words or definitions are highlighted in italics and is red color. Other key points are highlighted in bold type and in blue color. Answer the questions in the text as they are asked. Then, check your answer by reading further in the text. Be sure to answer the Test Your Understanding questions.
3. You have more work with the demand graph in this chapter. In particular, **you need to differentiate a movement along the demand curve and a shift in the demand curve.** Be sure to go over every point so that you can see how they are derived.
4. You will be given an In Class Assignment and a Homework assignment to illustrate the main concepts of this chapter. When you have finished the text, the Test Your Understanding questions, and the assignments, go back to the Objectives below. See if you can answer the questions without looking back at the text. If not, go back and re-read that part of the text. Then, try the Practice Quiz for Class 4.

## Objectives for Class 4: The Determinants of Demand and Supply

At the end of Class 4, you will be able to **define the following terms**:

1. **Complement**
2. **Substitute**
3. **Law of Supply**
4. **Shift In Demand or Supply**
5. **Movement Along the Demand Curve or the Supply Curve**

At the end of Class 4, you will also be able to **explain**

1. what would cause the demand or supply curves to **shift to the right**
2. what would cause the demand or supply curves to **shift to the left**
3. what would cause a **movement along** the demand curve or supply curve

## Class 4 Determinants Of Demand and Supply (latest revision August 2004)

### 1. The Determinants of Demand

In the last chapter, we focused on only one of the factors that affect the demand for a product --- **the price of that product**. There are certainly other factors. In fact, there are **six** other factors. These are called the *determinants of demand*. Let us examine them one at a time.

To prepare your thinking, consider how many units are you taking at your college this semester? \_\_\_\_\_ This is your demand for college classes. In Chapter 4, you considered the way that your demand would be affected by changes in the price (fees) of the

college. What other factors were involved in your decision to take the number of units you are taking? (That is, why did you take this number and not more nor less? Why did you take the classes at this College and not somewhere else?) Try to think of as many factors as you can. Then, compare your answer to the example of new homes considered in this chapter.

Consider the demand for new homes. You want a new home and choose one you like. The price is \$500,000. You don't buy. One reason is that your income is not large enough to be able to afford this amount. Therefore, **income** must be one of the factors that affect the demand for a given product. Normally, we expect that *as one's income rises (falls), the demand for a product will rise (fall)*.

Return now to your decision to buy a new home. Assume that you are willing to pay the price and have sufficient income. What other factors might enter into your decision? One might involve the method you will use to pay for this home --- borrowing money. The price of borrowing money is called **the interest rate**. The interest rate is one example of the **price of a complement**. *A complement is a different good that goes together with the one under consideration*. Homes and borrowing money tend to go together. So do bread and butter, coffee and sugar, gasoline and automobiles, homes and furniture, peanut butter and jelly, and many other examples. **What happens to the demand for new homes if the interest rate rises?** The answer, of course, is that it falls. It is also likely that the demand for butter will fall if the price of bread rises, the demand for automobiles will fall if the price of gasoline rises, and so on. Therefore, our relationship is: *if the price of the complement rises (falls), the demand for the product (homes) falls (rises)*.

Complements are different goods that are related to the one we are considering. There is another kind of relationship: the products may be **substitutes**. *Substitutes are different goods that compete with the one under consideration*. Coca-Cola and Pepsi Cola are substitutes, as are butter and margarine, American cars and Japanese cars, Wendy's and Burger King, baseball and football (in the fall) and many other examples. In our example, the main substitute for homes is apartments. **What happens to the demand for homes if the price of apartments falls?** If apartments rented for \$100 per month, more people would want to live in apartments and fewer in homes. It is also likely that the demand for Coca Cola would rise (fall) if the price of Pepsi Cola rises (falls), the demand for American cars would rise (fall) if the price of Japanese cars rises (falls), the demand for Wendys burgers would rise (fall) if the price of Burger King burgers rises (falls), and so on. Therefore, *the relationship is: as the price of the substitute (apartments) rises (falls), the demand for the product (homes) rises (falls)*.

We have thus far discussed three factors affecting your decision to buy a home other than the price of the home: your income, the price of complements such as borrowing money and buying furniture, and the price of substitutes such as apartments. One obvious other factor involves the fact that you like homes! This we call **tastes or preferences**. It involves the fact that there are certain psychological reasons for liking or disliking a particular good. Our principle is: *the more (less) we like a good or service, the greater (less) is our demand for it*. So what do you think happened to the demand for red wine when the television show 60 Minutes did a report that drinking red wine moderately every day lowered cholesterol and therefore lowered the risk of having a heart attack?

In the case of homes, we have often observed people buying not just one home but five or six. This does not mean buying one in Beverly Hills, another in Aspen Colorado for skiing, and another in Hawaii for surfing. It means several homes in the same area. Why would one do this? *One answer is that the buyer expects the price to rise in the near future.* Of course, the buyer does not know that the price will rise. So, there is a gamble here; the buyer expects the price to rise! These expectations affect our demand for many products. For example, people commonly buy stock or foreign monies because they expect the prices of the stock or of the foreign money to rise soon. (Do not confuse this with the last section where we considered how buyers respond when the price actually does change. Here, the price has not changed; buyers simply expect that it will change soon.) Our principle here is: *if buyers expect the price to rise (fall), the demand rises (falls) today.*

There are other kinds of expectations one might have that will affect the demand for products. *If one expects that the product will soon be unavailable, the demand will rise today.* This was the case for gasoline in the early 1970s and again in September of 2001. Expecting that gas stations would soon be out of gasoline, buyers rushed to stock-up. *Also, if one expects that one's income will fall, the demand for most products will fall.* During recessions, other people are losing their jobs or otherwise having their incomes reduced. Even though this has not yet happened to you, you may be worried that it will. As a result, you reduce your buying of many products. As we shall see later, expectations are important because they often become *self-fulfilling prophecies.*

The last of the factors affecting demand is the *population (number of buyers)*. The market demand is simply the sum of the individual demands. If, at the price of \$10, Bill wants to buy 10 units of the product, Jose wants to buy 20 units, and Mary wants to buy 30 units, then, of course, the market demand is 60 units. If Jordan becomes a buyer and wishes to buy 40 units, the market demand rises to 100 units. *Therefore, if there are more buyers, there must be more market demand.*

*Let us summarize. The demand for a given product will rise if:*

- 1. incomes rise for a normal good or fall for an inferior good*
- 2. the price of a complement falls*
- 3. the price of a substitute rises*
- 4. people like the product better*
- 5. people expect the price to rise soon*
- 6. people expect the product not to be available soon*
- 7. people expect their incomes to rise in the near future*
- 8. there are more buyers.*

*The opposite will cause the demand for the product to fall.*

Let us now return to the graph. Remember that the demand curve is a downward-sloping line showing that if the price of the product rises, the quantity demanded of that product will fall. How do we show these other determinants of demand on the same graph? *The answer is that we shift the demand curve. This means that we draw a new demand curve to replace to original one. At every price of the product, buyers now wish to buy a different quantity than they did before.* Review the demand curve in Class 4. Although we did not state it at the time, let us

assume that this represented the market demand for homes when income was \$50,000 per year. What happens if income rises to \$100,000 per year? The answer is, of course, that the demand for homes will increase because more people will want to buy homes.

**If the price is:**                      **The quantity demanded is:**  
    **Income = \$50,000**      **Income = \$100,000**

1	\$340,000	0	2000
2	\$320,000	1000	3000
3	\$300,000	2000	4000
4	\$280,000	3000	5000
5	\$260,000	4000	6000
6	\$240,000	5000	7000
7	\$220,000	6000	8000
8	\$200,000	7000	9000
9	\$180,000	8000	10000
10	\$160,000	9000	11000
11	\$140,000	10000	12000
12	\$120,000	11000	13000

If we plot the first two columns, we have the same demand curve as we drew in chapter 4. If we plot column 1 and column 3, we have a new demand curve (Demand <sub>2</sub>). The new demand curve has completely replaced the original one because income has risen. **We say that the demand curve has shifted to the right.** See the graph on the next page.

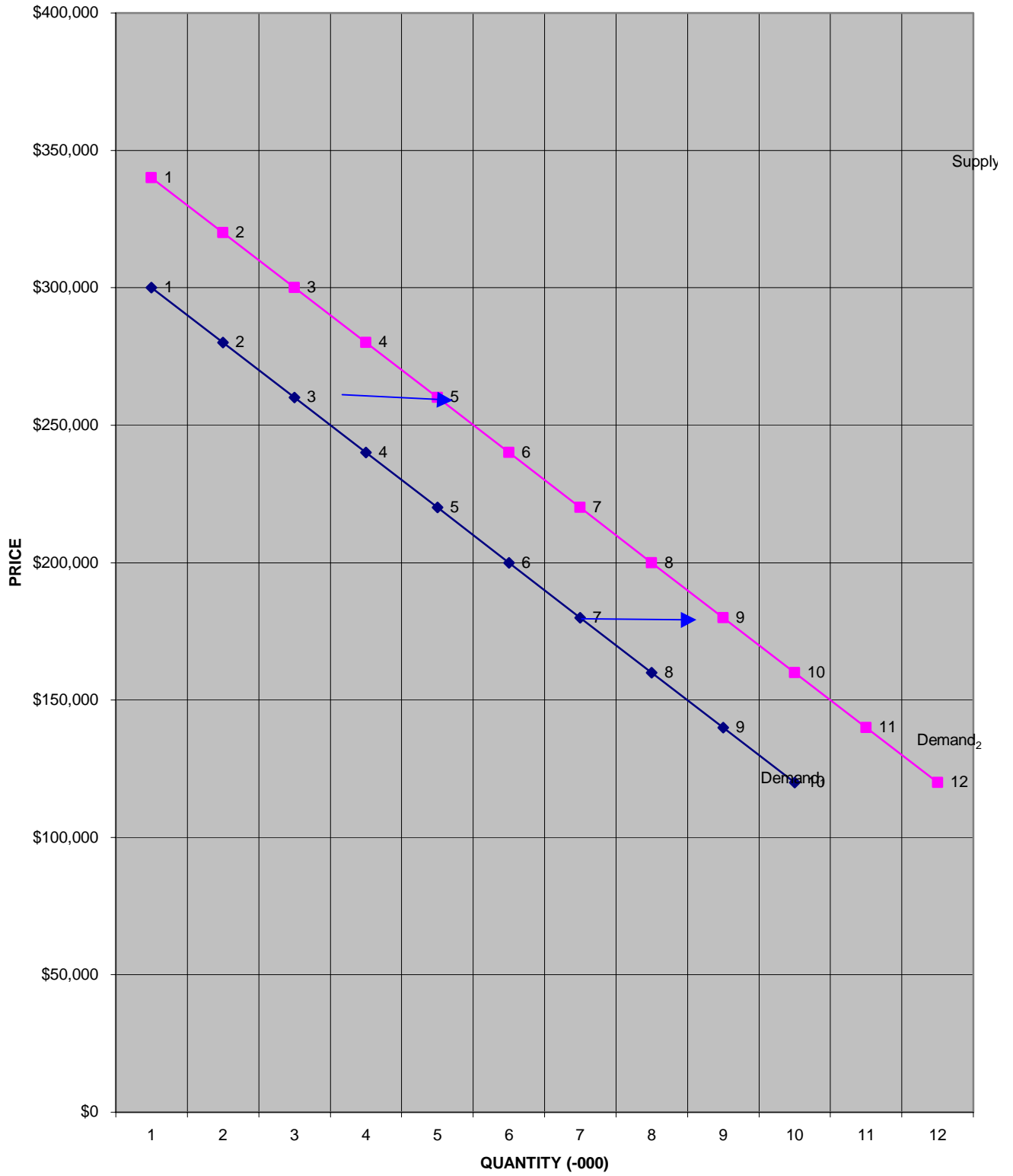
*To summarize the way the graph works: we move along the demand curve for one point to another on the same line if the price of the product changes. We shift the line if anything else (the determinants of demand) changes. If demand increases, the shift is to the right; if demand decreases, the shift is to the left.*

### **Test Your Understanding**

1. In each of the following cases, state whether (1) there is a movement along the demand curve for American automobiles, (2) the demand curve for American automobiles will shift to the right, or (3) the demand curve for American automobiles will shift to the left:

1. The price of gasoline rises \_\_\_\_\_
2. The price of American automobiles rises \_\_\_\_\_
3. The price of Japanese automobiles rises \_\_\_\_\_
4. Buyers' incomes fall \_\_\_\_\_
5. Buyers find that American automobiles are of higher quality \_\_\_\_\_
6. Mexican automobile buyers are now able to buy American automobiles \_\_\_\_\_
7. Buyers expect that the price of American automobiles will rise next year \_\_\_\_\_

## DEMAND SHIFTS TO THE RIGHT



## Internet Assignment

This chapter has considered factors that affect the demand for homes. Consider the demand for homes in California. Go to the site for the **California Statistical Abstract** on my web site. In each of the following cases, describe what the data say has been happening over time. Then, explain how these changes would affect the demand for homes in California.

1. The **population** of California (Table B1)
2. The **per capita income** of California (You can get the income data in Table D4. You then have to divide by the population from question 1 to have the per capita income.)
3. The **prices of homes** in California (Table I11) The table gives only the prices of existing homes. But the prices of new homes have been changing in the same direction.
4. **Rents** on Apartments (Table I2)
5. **Mortgage Interest Rates**. (Interest rates in California are basically the same as in the rest of the country. For this, you need to go to the following site:  
<http://www.census.gov/statab/freq/98s0827.txt>)
6. Then, write a **brief conclusion**. What has been happening to the demand for homes in California (see Table I3)? Based on your answers above, **why** might this have been happening?

## 2. Supply

Thus far, we have been focusing exclusively on buyers. But buyers are only half of the market. We must also consider the behaviors of **sellers**. Discussing sellers is somewhat easier because we can **assume that sellers have only one motivation: to maximize their profits**. Sellers will be motivated to do more of anything that increases profits and less of anything that decreases profits. *The profits are calculated as the difference between the total revenues and the total costs.*

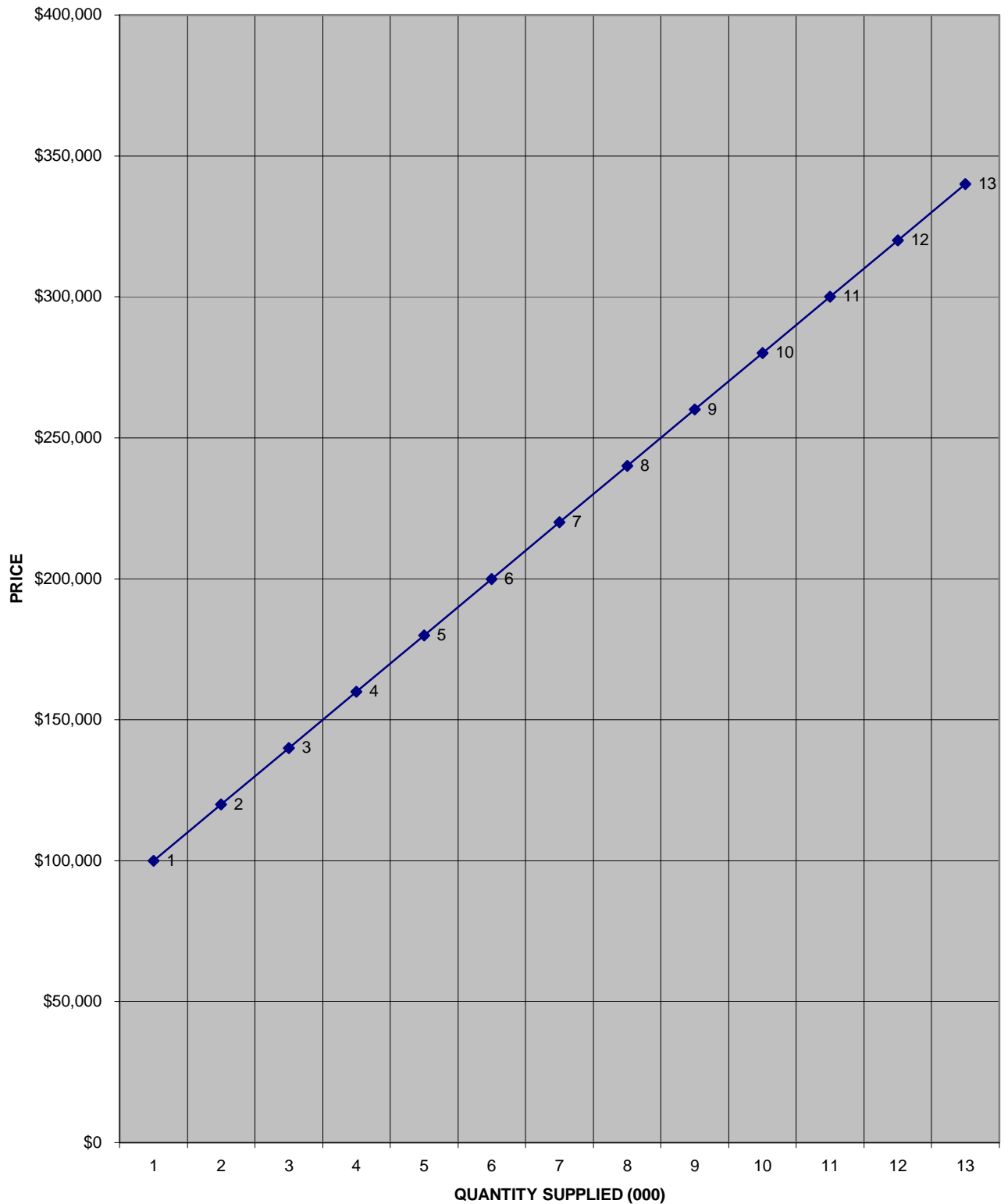
Let us begin with the **total revenues**, the money taken in from selling our product. In the chapter on elasticity, we calculated this as the **price of the product times the quantity sold**. If we sell 100 units at \$10 each, our total revenues equal \$1,000. If we sell 100 units at \$20, our revenues equal \$2,000. Since we gain more revenues if the price is \$20 than if it is \$10, we would likely want to sell more units of the product if the price is \$20. *So we can conclude that as the price of the product rises (falls), the quantity supplied will rise (fall).* We call this statement the **law of supply**. (Go back and compare this statement with the law of demand.) To illustrate the law of supply, you would expect that more and more homes would be built after 1995 when the prices of homes began rising greatly. This is indeed what has occurred. And you would expect that more and more people would want to become engineers and scientists when the prices paid for these people (called the wages) rose. Again, indeed, this is what has occurred. (Does it make any sense that when the ticket prices charged for baseball and football games rose, Major League Baseball changed from 154 games to 162 games per year and the National Football League changed from 12 games to 16 games per year?)

We can illustrate the law of supply with a *supply schedule* for homes.

	<b>Price of Homes</b>	<b>Quantity Supplied</b>
1	\$ 80,000	1000
2	\$100,000	2000
3	\$120,000	3000
4	\$140,000	4000
5	\$160,000	5000
6	\$180,000	6000
7	\$200,000	7000
8	\$220,000	8000
9	\$240,000	9000
10	\$260,000	10000
11	\$280,000	11000
12	\$300,000	12000
13	\$320,000	13000
14	\$340,000	14000

The table shows that, as the price charged for homes rises, sellers wish to sell more homes. We can also plot this in the graph below. The graph depicts the law of supply as an upward-sloping line. Notice that the line does not begin at the origin. There is some price --- above zero --- at which no seller will produce at all. As with the demand graph, we *move along* the line (for example, from point 1 to point 2) if the price of the product changes. (So we move along the line from point 12 to point 13 if the price rises from \$320,000 to \$340,000 per home. This gives us the quantity supplied, which rises from 130,000 homes to 14,000 homes.) We *shift* the line if anything else changes. We will consider the factors causing shifts in supply later in this chapter.

## THE SUPPLY CURVE



As with the demand curve, *we move along the supply curve, from one point to another on the same line, if the price of the product changes.* We shift the line if anything else changes. Those factors that will cause the shifts in supply are called the *determinants of supply*. There are **four** of them.

(1) The goal of a company, once again, is to maximize profits, calculated as the difference between the total revenues and the total costs of production. So, one of the determinants of supply must be the **costs of production**. *As costs of production rise, profits fall, and therefore the quantity supplied should fall (shift to the left). Conversely, as costs of production fall, the profits rise, and the quantity supplied should rise (shift to the right).* Costs include the costs of natural resources such as wood used in building a home, the costs of labor (wages and benefits), and the costs of the capital. We will cover them in later chapters.

(2) When we considered demand, one of the determinants was population (the number of buyers). The same is true for supply. One of the determinants of supply is the **number of sellers of the product**. *When the number of sellers increases, the supply should increase (shift to the right). When the number of sellers falls, the supply should decrease (shift to the left).*

(3) When we considered demand, one of the determinants was the price of a substitute good. Again, the same is true for supply. In this case, the substitute is **a substitute for the seller --- another good also produced by the same seller**. This may or may not be a substitute for the buyer. For example, wheat and corn can be grown on the same land; they are substitutes for the seller. So are avocados and oranges or Coca Cola and Diet Coke (because they are produced by the same company). *If the price of the other good rises, the supply of the good in question will fall (shift to the left).* For example, if the good in question is wheat and the price of corn rises, sellers will produce less wheat (and more corn). If the price of regular Coca Cola rises, the supplier will produce less Diet Coke (and more regular Coca Cola). On the other hand, *if the price of the other good falls, the supply of this good will rise (shift to the right).* Remember that goods are substitutes for the seller only if they are produced by the same company.

(4) Finally, when we considered demand, one of the determinants was **expectations**. This is true for supply as sellers also have expectations that affect their behavior. *If sellers expect the price to rise, they will want to sell less today (shift to the left)* and wait for the price to rise later. Home sellers will hold their homes off the market if they believe the prices will rise soon. In 1973, oil tankers remained offshore while angry motorists waited in long lines for gasoline. The reason was that the price of gasoline was 36 cents per gallon. The government was allowing the price to rise only 2 cents per week; the oil companies estimated that it would rise to about 65 cents. So they reduced supply and waited until the price would reach the predicted 65 cents. Conversely, *if sellers expect the price to fall, they want to sell more now (shift to the right).* At the beginning of 1995, holders of Mexican pesos believed that the price would fall. They got rid of them (sold them in the foreign exchange market) as fast as they could. The same is true for holder of stocks in the fall of 1998.

***In summary, supply will shift to the left (right) if:***

- (1) costs of production rise (fall)***
- (2) the number of sellers falls (rises)***
- (3) the price of another good produced by the same seller rises (falls)***
- (4) sellers expect the price of the product to rise (fall) in the near future.***

***(A shift to the right means that sellers want to produce and sell more homes than they did before at any price. Note that the shift is to the right and represents an increase. It is NOT a shift down. The graph is read left to right, not up and down. A shift to the left would mean that sellers want to produce and sell more home at any price than they did before.)***

### Test Your Understanding

1. The following **supply schedule** for new homes illustrates the law of supply:

	Price of Homes	Quantity Supplied <sub>1</sub>	Quantity Supplied <sub>2</sub>
1	\$ 80,000	1000	3000
2	\$100,000	2000	4000
3	\$120,000	3000	5000
4	\$140,000	4000	6000
5	\$160,000	5000	7000
6	\$180,000	6000	8000
7	\$200,000	7000	9000
8	\$220,000	8000	10000
9	\$240,000	9000	11000
10	\$260,000	10000	12000
11	\$280,000	11000	13000
12	\$300,000	12000	14000
13	\$320,000	13000	15000
14	\$340,000	14000	16000

Plot the points for the Price and for Quantity Supplied<sub>1</sub> on graph paper. Label the points 1 through 14. Connect the points and complete a supply curve.

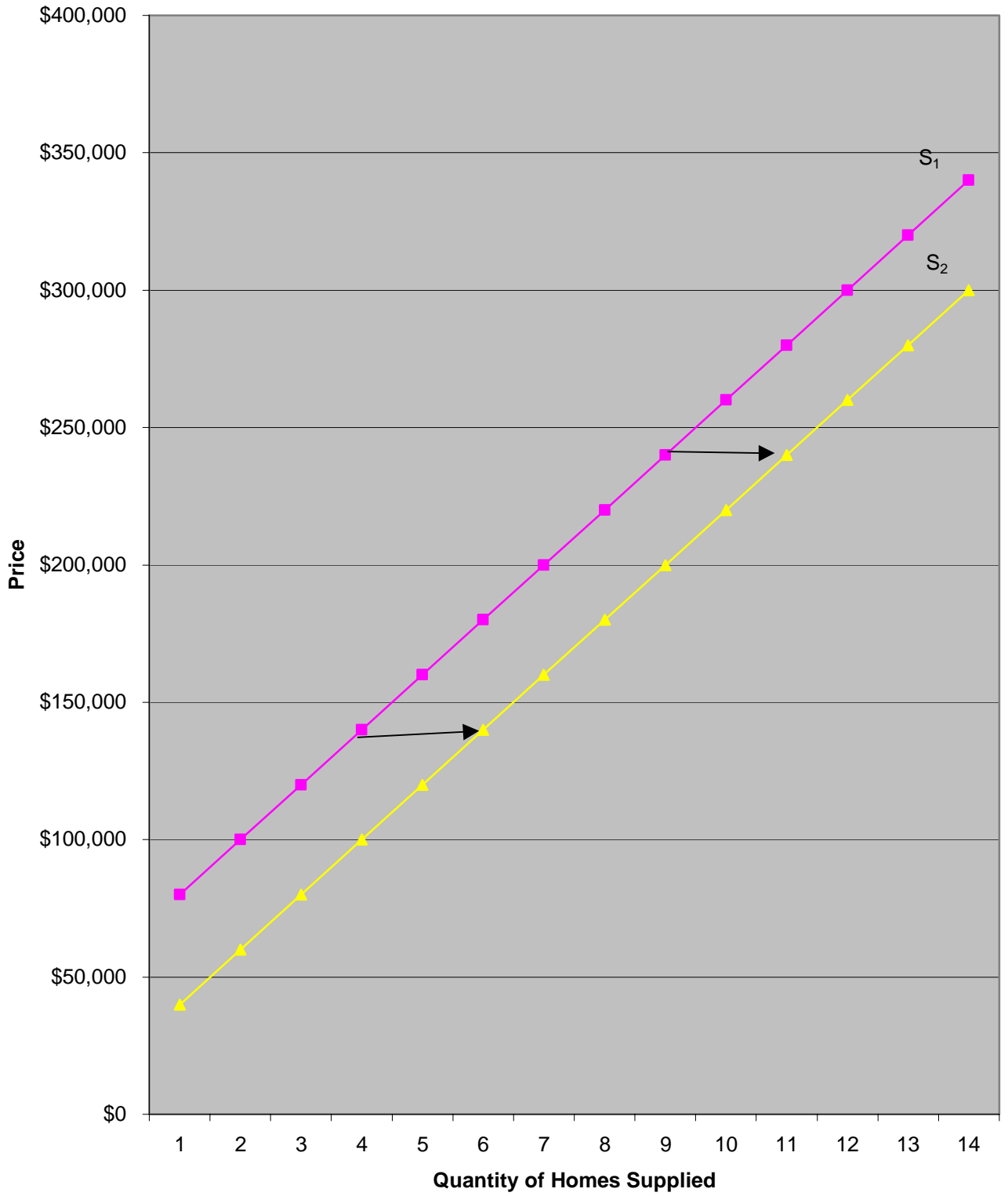
Name some **reasons** that the supply curve for new homes would be upward sloping (that is, that an increase in the price of new homes would encourage builders to build new homes):

Now, plot the points for the Price and for Quantity Supplied<sub>2</sub> on the graph on the same graph. Label the points 1 through 14. Connect the points and complete a new supply curve. Label the first supply curve Supply<sub>1</sub> and the second supply curve Supply<sub>2</sub>.

The graph you drew represents a shift in the supply curve to the \_\_\_\_\_(right or left?)

The shift in the supply curve that you drew could have been caused by:

1. a/an \_\_\_\_\_(increase or decrease?) in a cost of producing new homes
2. a/an \_\_\_\_\_(increase or decrease?) in the number of home builders in the industry
3. a/an \_\_\_\_\_(increase or decrease?) in the price that can be received by the builders for building apartment buildings
4. an expectation by home builders that the prices of new homes will \_\_\_\_\_(increase or decrease?) in the near future

**Supply Shifts Right**

## Practice Quiz on Chapter 5

1. If the price of DVRs fell and, as a result, the demand for VHS recorders fell, we could conclude that VHS recorders and DVRs are
  - a. normal goods
  - b. substitutes
  - c. complements
  - d. unrelated
2. Which of the following would cause the demand for gasoline to **shift to the right**?
  - a. an increase in the price of automobiles by \$1000
  - b. the price of gasoline falls by \$0.10 per gallon
  - c. buyers buy SUVs that are larger and obtain fewer miles per gallon
  - d. for health reasons, people desire to bicycle more
3. To find the quantity people will buy, we **move along** the demand line if what changes?
  - a. price of the product
  - b. income
  - c. price of a substitute
  - d. price of a complement
4. If people's tastes change so that they like the product better, the demand for the product will
  - a. shift to the right
  - b. shift to the left
  - c. move along
5. If buyers expect the price of a product to rise greatly very soon, the demand for that product will
  - a. shift to the right
  - b. shift to the left
  - c. move along
6. The **law of supply** states that, other things being unchanged,
  - a. as the price rises, the quantity supplied rises
  - b. as the price rises, the quantity supplied falls
  - c. as the supply rises, the price falls
  - d. as the demand rises, the supply falls
7. Which of the following would cause the supply curve of wheat to **shift to the right**?
  - a. an increase in wages paid to agricultural workers
  - b. technological changes which lower the costs of production
  - c. a decrease in the number of wheat growers
  - d. an increase in the price of corn
8. We **move along** the supply curve if what changes?
  - a. the price of the product
  - b. the cost of production
  - c. the number of sellers
  - d. all of the above

Answers: 1. B 2. C 3. A 4. A 5. A 6. A 7. B 8. A