

Part II: The Tools of Analysis

Objectives for Chapter 5: Demand

At the end of Chapter 5, you will be able to **define the following terms**:

1. Demand
2. Law of Demand
3. Demand Schedule
4. Demand Curve (and draw the curve)
6. Complement
7. Substitute
8. Shift in Demand
9. Movement Along the Demand Curve

At the end of Chapter 5, you will also be able to **explain**

1. what changes would cause the demand curve to **shift to the right**
2. what changes would cause the demand curve to **shift to the left**
3. what change would cause a **movement along** the demand curve

Chapter 5 Demand (latest revision August 2004)

We have discussed aggregate production, the total production of all goods and services as measured by the Real Gross Domestic Product. As the course proceeds, we will want to know what makes aggregate production rise over time. We have also discussed the aggregate price level, the prices of all goods and services as measured by the GDP Deflator. As the course proceeds, we will also want to know what makes prices rise – that is, why there has been inflation. But in the beginning of our analysis, we will find it easier to focus on single products instead of aggregates. Studying aggregates can be complicated. So, in this chapter, we will begin to consider these questions: **what determines the quantity produced of a single product and what determines the price of that single product**. In other words, why were 17 million automobiles sold in a given year? Why not more or less? And why was the price of the average automobile approximately \$20,000? Why not more or less? You will see later that, once we understand what determines the quantity produced and what determines the price of a single product such as automobiles, it is a short jump to understand what determines the quantities produced and the prices of all goods and services.

So, what determines the quantity produced and what determines the price of a single product? The answer to each of these questions is the same: *the demand for the product and the supply of the product*. In this chapter, we will focus on the demand for the product. In the next chapter, we will consider the supply of the product. Then we will put the demand and the supply together and determine how they answer the two questions.

Let us begin with demand. *The demand for a product is the quantity of that product that buyers desire to buy at each possible price*. So for example, we might buy 17 million automobiles, 2 million new homes, 70 million baseball tickets, and so on. What factors explain the quantity demanded of a given product by buyers?

1. The Law of Demand

Test Your Understanding

Assume that you are planning to attend Palomar College next semester. This is your demand for college credits. Determine how many units you would take if the fee per unit is as given.

FEE PER UNIT	
\$ 5	_____
\$18	_____
\$30	_____
\$50	_____
\$100	_____
\$500	_____
\$1,000	_____

One of the key factors that affect the demand for any product is certainly the **price of that product**. Think of buying soft drinks. You go into the market. A six-pack sells for \$1.99. You buy a given number --- say two six-packs. Next week, there is a sale --- the price is \$0.99 a six-pack. You stock up and buy five six-packs. The following week, the

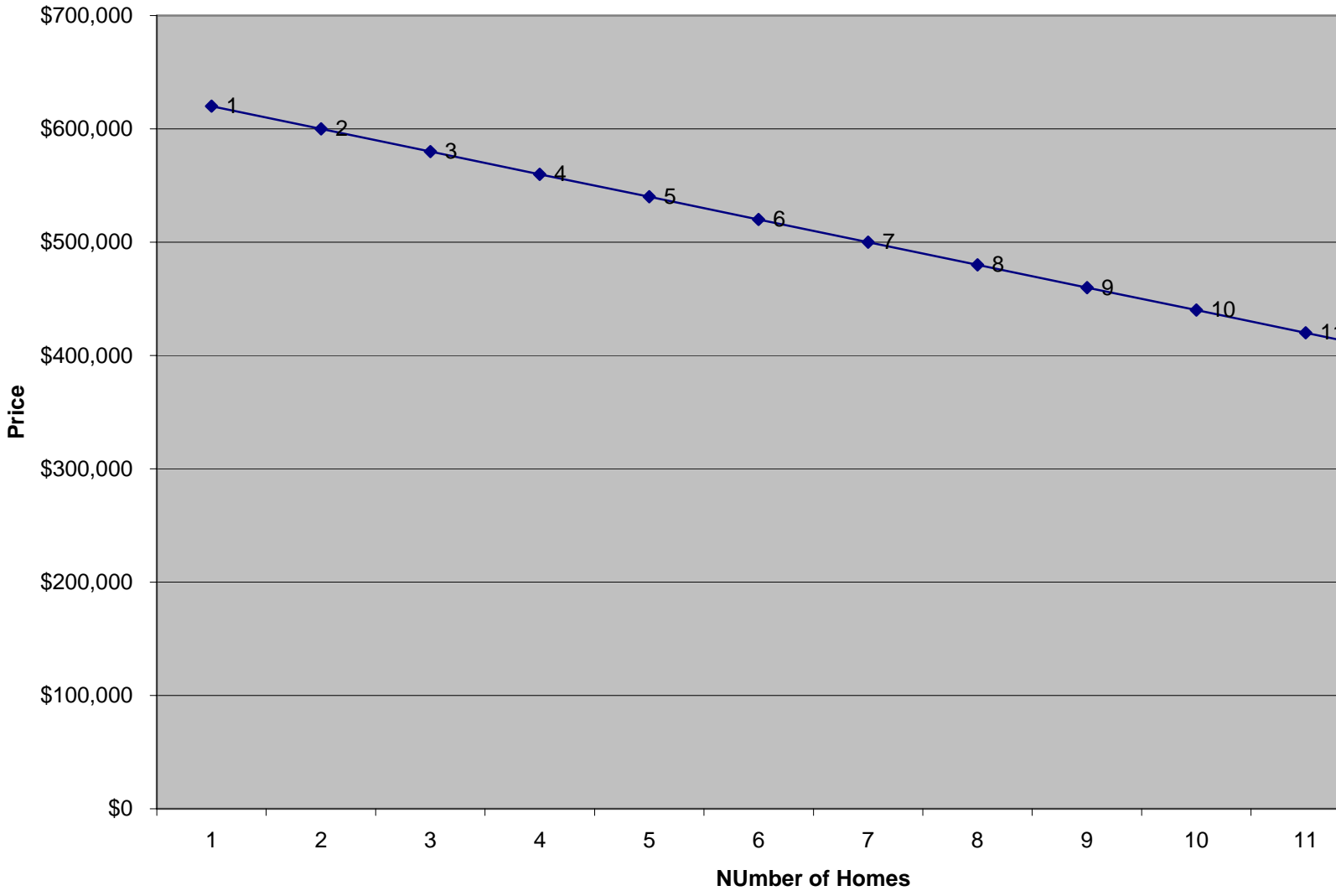
price has risen to \$2.99 per six-pack. This is just too expensive --- you don't buy any. Or you are planning to drive someplace for a weekend vacation. Suddenly, the price of gasoline rises from \$1.29 to \$2.09. You decide the trip is too expensive and therefore don't go. What would happen to the demand for electricity when the rates doubled in July of 2000? (Explain how people would change their demand for electricity.) This result is familiar to anyone who shops regularly. We can generalize it with the following statement: *as the price of a product rises (falls), the quantity demanded of that product falls (rises)*. The statement is typically referred to as the *law of demand*. While one can perhaps think of an exception (if the price of a life saving drug that has no substitute rises, what would happen to your quantity demanded?), they are so few that we can assume safely that the statement is true in all cases. Did you find that the law of demand was true in the case of college units? Why or why not?

The following *demand schedule for new homes* illustrates the law of demand:

	Price	Quantity Demanded Per Month
	\$640,000	0
1	\$620,000	1000
2	\$600,000	2000
3	\$580,000	3000
4	\$560,000	4000
5	\$540,000	5000
6	\$520,000	6000
7	\$500,000	7000
8	\$480,000	8000
9	\$460,000	9000
10	\$440,000	10000
11	\$420,000	11000

Note that, in this example, at any price above \$620,000, no one will buy any homes. They are just too expensive. Then, as the price falls, people buy more homes in the month. At a price of \$620,000 per home, only 1,000 people can afford to and are willing to buy a new home each month. But at a price of \$420,000 per home, 11,000 people can now afford to and are willing to buy a new home each month. We can then picture this in the graph on the next page. The graph allows us to analyze more clearly because we can see visually what is occurring. Before you look at the graph on the next page, try plotting the 11 points on a graph. Connect all of the points. Notice the **downward-sloping line**. As the price of homes falls, people buy more homes. As the price of homes rises, people buy fewer homes.

Demand for Homes



Test Your Understanding

How many units are you taking this semester? _____ This is your demand for college classes. Earlier, you considered the way that your demand would be affected by changes in the price (fees). What other factors would be 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.

2. The Determinants of Demand

There are other factors that affect the demand for a product. In determining the factors that affected your college choice, you should have arrived at some of them. In all, there are **six** other factors that affect the demand for a product. These factors are called the *determinants of demand*. Let us examine them one at a time.

(1) Consider again the demand for new homes. You want a new home and choose one you like. The price is \$1,000,000. 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)*. For certain products, as incomes rise, the demand for the product rises very little. Food would be an example. For other products, when incomes rise, the demand for the product not only rises, it rises greatly. New homes and new cars are prime examples. When incomes are rising, the construction and automobile industries prosper. But when incomes are falling, the construction and automobile industries are hurt harder than most other industries.

(2) 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, the relationship is: *if the price of the complement rises (falls), the demand for the product (homes) falls (rises)*.

(3) 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 would want to live 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 Wendy's burgers would rise (fall) if the price of Burger King burgers rises (falls), and so on. Therefore, ***our relationship is: as the price of the substitute (apartments) rises (falls), the demand for the product (homes) rises (falls).***

(4) 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. Another obvious other factor involves the fact that people 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. When asked what people want out of life, most people include a home of their own on the list. ***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?

(5) The most obvious of the factors affecting demand is the ***population (number of buyers)***. The demand is the market demand. We achieve this by adding up the demand of each person. 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.*** The demand for new homes in San Diego County has increased tremendously over the past thirty years. The main reason has been the large increase in the population of San Diego County (from about one million people in 1970 to about three million now).

Besides the number of people, we must consider the ***composition of the population***. Different people buy different things. So the demand for products changes as the composition of the population changes. ***Here, we will consider the composition of the population by age.*** We will do so because of a unique event that occurred between 1946 and 1964 --- ***the baby boom***. During these years, the birth rate rose dramatically. What makes the baby boom important is that it is sandwiched between two ***baby busts***. From 1929 to 1945, the birth rate was very low, first because of the Great Depression (1929 to 1941) and then because of World War II (1941 to 1945). And then from 1965 to about 1985, the birth rate was very low again (partly as a result of the slow economic growth discussed in Chapter 2). As a result, as of the year 2004, there were a relatively large number of people age 40 to 59 – the baby boomers. There were a relatively small number of people age 60 to 75 --- the first baby bust group. And there were a relatively small number of people age 19 to 40 --- the second baby bust group. This skewed age distribution affects the demand for many products. For example, people usually buy their first new home in the late twenties or early thirties. For a long time, as the baby boomers were aging, the demand for new homes was rising just because more and more people were coming into the home buying years. As we will see in the next chapter, this increase in demand will cause the price of homes to rise. Rising home prices were one of

many issues facing the baby boomers. More recently, fewer people are coming into the home buying years as the second baby bust group ages. This alone causes the demand for new homes to decline. We shall encounter the baby boom and the baby busts several times --- when we consider the job market, when we consider the social security system, and when we consider national savings. (Since 1985, there has been another baby boom. This phenomenon, called the *baby boom echo*, has resulted because there are so many baby boom parents, not because people are having large families. **Therefore, there are a relatively large number of people age 18 and under.**)

(6) Finally, in the case of homes, we have often observed people buying not just one home. Instead, they are buying five or six homes. 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 the 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 earlier 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 2003. 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 and increase your saving. As we will see later, expectations are important because they can become *self-fulfilling prophecies*.

Let us summarize. The demand for a given product will rise (fall) if:

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

Graphing Changes in the Determinants of Demand

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

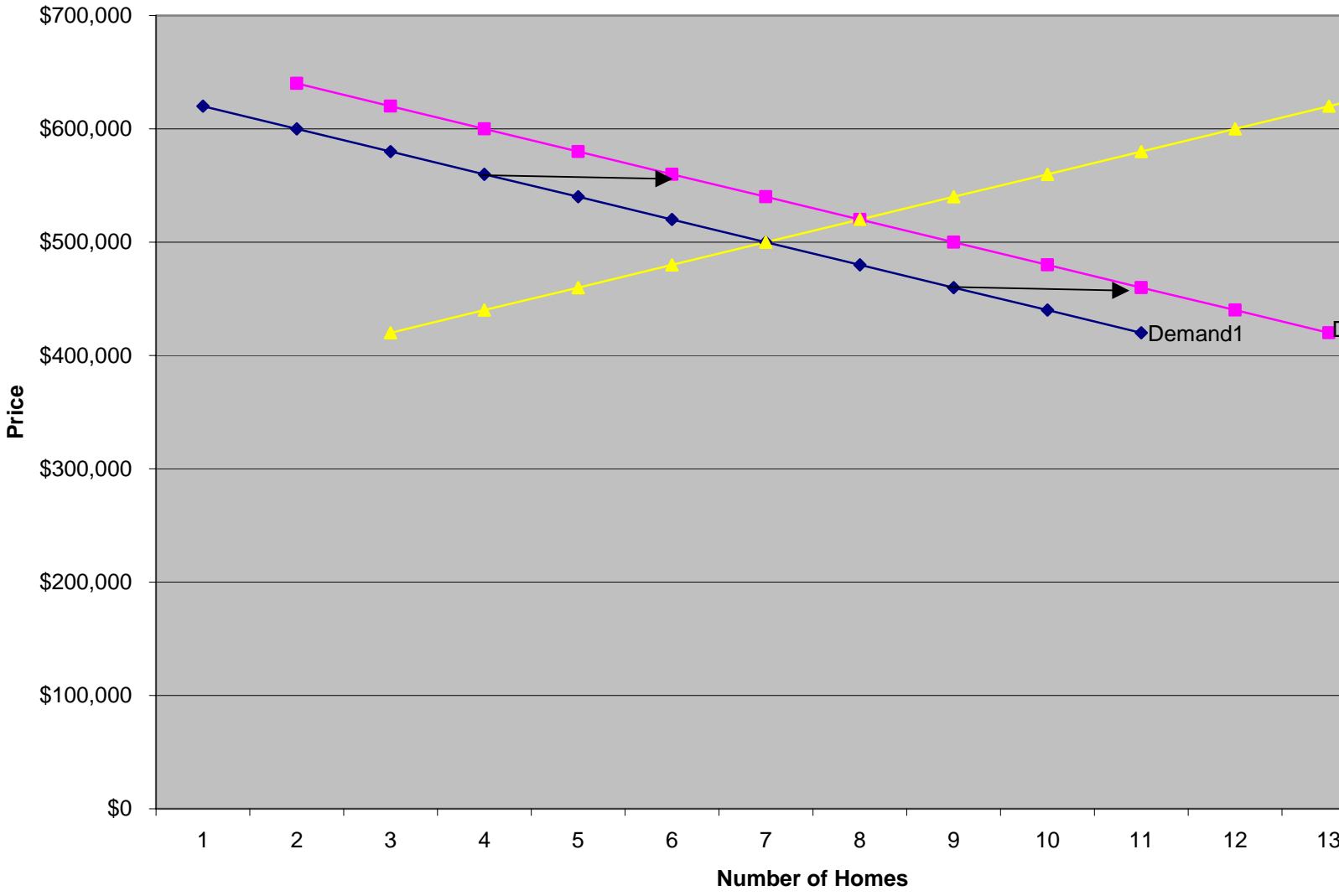
graph? *The answer is that we shift the demand curve. This means that we draw a new demand curve to replace to original one. At every price of the product, buyers now wish to buy a different quantity than they did before.* Review the demand curve above. Let us assume that this represented the market demand for homes when the average income was \$50,000 per year. What happens if the average income rises to \$100,000 per year? The answer is, of course, that the demand for homes will increase because more people will be able to and will want to buy homes.

	<u>If the price is:</u>	<u>The quantity demanded is:</u>	
		<u>Income = \$50,000</u>	<u>Income = \$100,000</u>
1	\$640,000	0	2000
2	\$620,000	1000	3000
3	\$600,000	2000	4000
4	\$580,000	3000	5000
5	\$560,000	4000	6000
6	\$540,000	5000	7000
7	\$520,000	6000	8000
8	\$500,000	7000	9000
9	\$480,000	8000	10000
10	\$460,000	9000	11000
11	\$440,000	10000	12000
12	\$420,000	11000	13000

If we plot the first two columns, we have the same demand curve as we drew above. If we plot column 1 and column 3, we have a new demand curve (Demand₂). 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*.

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.

Demand Shifts to the Right



Test Your Understanding

The product in question is movie tickets. In each case, state whether the demand for movie tickets will increase or decrease. Then, state if there is a shift or a movement along the demand curve for movie tickets. Finally, if there is a shift, state whether the shift is to the right or the left.

- the price of a movie ticket rises from \$7.00 to \$9.00
- more people move into the area where the movie theater is located
- the people in the area have higher incomes
- the movie theater puts in stadium seating, making it more comfortable to be at the movie theater
- the price to rent movies at the video rental store rises from \$3 to \$10
- the prices of popcorn, candy, colas, and other food items at the movie theater rises
- a good movie is showing today while the price of admission is \$7.00. However, in two weeks, the price to see the same movie is expected to rise to \$10.00.

Practice Quiz for Chapter 5

- The **law of demand** states that
 - as the price rises, the quantity demanded falls
 - as the price rises, the quantity demanded rises
 - as the demand rises, the price rises
 - as income rises, the demand rises

In each of the following cases, choose one of the following

- a movement along the demand curve for American automobiles
 - the demand curve for American automobiles will shift to the right
 - the demand curve for American automobiles will shift to the left
- The price of gasoline rises
 - The price of American automobiles rises
 - The price of Japanese automobiles rises
 - Buyers' incomes fall
 - Buyers find that American automobiles are of higher quality
 - Mexican automobile buyers are now able to buy American automobiles
 - Buyers expect that the price of American automobiles will rise next year
- Draw a demand curve for computers in the graph space below. Label it D_1 .
 - On the graph in question 9, draw a new demand curve showing the result of the growth of the Internet, which made it more desirable for people to own computers.

Price



Answers: 1. A 2. C 3. A 4. B 5. C 6. B 7. B 8. B 10. Shift right