

It's important to remember that *the price elasticity of demand is not the same as the slope of the demand curve.*

If we calculate the price elasticity of demand for a price cut, the percentage change in price will be negative, and the percentage change in quantity demanded will be positive. Similarly, if we calculate the price elasticity of demand for a price increase, the percentage change in price will be positive, and the percentage change in quantity demanded will be negative. Therefore, the price elasticity of demand is always negative. In comparing elasticities, though, we are usually interested in their relative size. So, we often drop the minus sign and compare their *absolute values*. For example, although  $-3$  is actually a smaller number than  $-2$ , we say that a price elasticity of  $-3$  is larger than a price elasticity of  $-2$ .

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## Elastic Demand and Inelastic Demand

If the quantity demanded is very responsive to changes in price, the percentage change in quantity demanded will be *greater* than the percentage change in price, and the price elasticity of demand will be greater than 1 in absolute value. In this case, demand is **elastic**. For example, if a 10 percent decrease in the price of bagels results in a 20 percent increase in the quantity of bagels demanded, then:

$$\text{Price elasticity of demand} = \frac{20\%}{-10\%} = -2,$$

and we can conclude that the demand for bagels is elastic.

When the quantity demanded is not very responsive to price, however, the percentage change in quantity demanded will be *less* than the percentage change in price, and the price elasticity of demand will be less than 1 in absolute value. In this case, demand is **inelastic**. For example, if a 10 percent decrease in the price of wheat results in a 5 percent increase in the quantity of wheat demanded, then:

$$\text{Price elasticity of demand} = \frac{5\%}{-10\%} = -0.5,$$

and we can conclude that the demand for wheat is inelastic.

In the special case where the percentage change in quantity demanded is equal to the percentage change in price, the price elasticity of demand equals  $-1$  (or 1 in absolute value). In this case, demand is **unit elastic**.

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## An Example of Computing Price Elasticities

Suppose you own a service station, and you are trying to decide whether to cut the price you are charging for a gallon of gas. You are currently at point *A* in Figure 6.1, selling 1,000 gallons per day at a price of \$4.00 per gallon. How many more gallons you will sell by cutting the price to \$3.70 depends on the price elasticity of demand for gasoline at your service station. Let's consider two possibilities: If  $D_1$  is the demand curve for gasoline at your station, your sales will increase to 1,200 gallons per day, point *B*. But if  $D_2$  is your demand curve, your sales will increase only to 1,050 gallons per day, point *C*. We might expect—correctly, as we will see—that between these points, demand curve  $D_1$  is *elastic*, and demand curve  $D_2$  is *inelastic*.

To confirm that  $D_1$  is elastic between these points and that  $D_2$  is inelastic, we need to calculate the price elasticity of demand for each curve. In calculating price elasticity between two points on a demand curve, though, we face a problem because we get a different value for price increases than for price decreases. Suppose we calculate the price elasticity for  $D_1$  as the price is cut from \$4.00 to \$3.70. This 7.5 percent price cut increases the quantity demanded from 1,000 gallons to 1,200 gallons, or by 20 percent. Therefore, the price elasticity of demand between points *A* and *B* is  $20/-7.5 = -2.7$ . Now let's calculate the price elasticity for  $D_1$  as the price is *increased* from \$3.70 to \$4.00. This 8.1 percent price increase causes a decrease in the quantity demanded from 1,200 gallons to 1,000 gallons, or by 16.7 percent. So, now our measure of the price elasticity of demand between points *A* and *B* is  $-16.7/8.1 = -2.1$ . It can be confusing to have different

**Elastic demand** Demand is elastic when the percentage change in the quantity demanded is *greater* than the percentage change in price, so the price elasticity is *greater* than 1 in absolute value.

**Inelastic demand** Demand is inelastic when the percentage change in quantity demanded is *less* than the percentage change in price, so the price elasticity is *less* than 1 in absolute value.

**Unit-elastic demand** Demand is unit elastic when the percentage change in quantity demanded is *equal* to the percentage change in price, so the price elasticity is equal to 1 in absolute value.