

## Elasticity and Total Revenue

Consider the following: total revenue (TR) = price (P) x quantity demanded ( $Q_d$ ).

The responsiveness of quantity demanded to changes in price will determine whether a price increase leads to an increase or decrease in the total revenue generated.

The law of demand tells us that a price increase (decrease) will result in a decrease (increase) in quantity demanded: They move in opposite directions. What happens to TR when price changes is determined by the dominant effect, either the price effect or the quantity effect. In this case, knowing the price elasticity of demand solves the problem.

Consider that

- $\epsilon_d < 1 \Rightarrow \% \Delta \text{ in } Q_d < \% \Delta \text{ in price} \Rightarrow$  The *price effect* dominates.  
 If price is increasing ( $Q_d \downarrow$  by less), TR will increase.  
 If price is decreasing ( $Q_d \uparrow$  by less), TR will decrease.
- $\epsilon_d = 1 \Rightarrow \% \Delta \text{ in } Q_d = \% \Delta \text{ in price} \Rightarrow$  Neither effect dominates. TR remains unchanged.
- $\epsilon_d > 1 \Rightarrow \% \Delta \text{ in } Q_d > \% \Delta \text{ in price} \Rightarrow$  The *quantity effect* dominates.  
 If price is increasing ( $Q_d \downarrow$  by more), TR will decrease.  
 If price is decreasing ( $Q_d \uparrow$  by more), TR will increase.

Use this information to do the problems below. Fill in the blank or underline the correct answer.

- Price rises from  $P = \$5$  to  $P_1 = \$6$ , and quantity demanded decreases from  $Q = 15$  to  $Q_1 = 10$ .
  - The coefficient of elasticity equals \_\_\_\_\_.
  - |     |       |   |       |   |       |
|-----|-------|---|-------|---|-------|
| (B) | P     | x | Q     | = | TR    |
|     | _____ | x | _____ | = | _____ |
  - |     |       |   |       |   |        |
|-----|-------|---|-------|---|--------|
| (C) | $P_1$ | x | $Q_1$ | = | $TR_1$ |
|     | _____ | x | _____ | = | _____  |
  - $P (\downarrow / \uparrow)$ ;       $TR (\downarrow / \uparrow)$       Demand is (*elastic / unit elastic / inelastic*).
- Price decreases from  $P = \$10$  to  $P_1 = \$9$ , and quantity demanded increases from  $Q = 100$  to  $Q_1 = 110$ .
  - The coefficient of elasticity equals \_\_\_\_\_.
  - |     |       |   |       |   |       |
|-----|-------|---|-------|---|-------|
| (B) | P     | x | Q     | = | TR    |
|     | _____ | x | _____ | = | _____ |
  - |     |       |   |       |   |        |
|-----|-------|---|-------|---|--------|
| (C) | $P_1$ | x | $Q_1$ | = | $TR_1$ |
|     | _____ | x | _____ | = | _____  |
  - $P (\downarrow / \uparrow)$ ;       $TR (\downarrow / \uparrow)$       Demand is (*elastic / unit elastic / inelastic*).

Activity written by Kelly A. Chaston, Davidson College, Davidson, N.C.