

Section 6.3 (cont.)

3) The demand for marble fountains can be modeled by $D(p) = -45p + 900$ fountains when the market price is p hundred dollars per fountain.

- a) According to the model, at what price will consumers no longer purchase fountains? Is this price guaranteed to be the highest price any consumer will pay for a marble fountain? Explain.
- b) Find the quantity of fountains that consumers will purchase if the market price is \$1150.
- c) Determine the amount consumers are willing and able to spend to purchase 500 fountains.
- d) Find the consumers' surplus when consumers purchase 500 fountains.
- e) The willingness of marble fountain producers to supply fountains can be modeled by the following function:

$$S(p) = \begin{cases} 0 \text{ fountains} & \text{if } p < 2 \\ 0.3p^2 + 8.1p + 300 \text{ fountains} & \text{if } p \geq 2 \end{cases} \text{ when the market price is } p \text{ hundred dollars}$$

per fountain. How many fountains will producers supply if the market price is \$175? \$400?

- f) At what price will producers supply 365 fountains?
- g) Find the producers' revenue if the market price is \$450.
- h) Find the producers' surplus if the market price is \$450.
- i) Find the price fountains will be sold for at the equilibrium point.
- j) Find the total social gain from the sale of fountains at market equilibrium.