Section 4.7: Elasticity of Demand

Definition: The **relative rate of change** of a function $f(x)$ is $\dfrac{f'(x)}{f(x)}$.

The **percentage rate of change** is $100 * \dfrac{f'(x)}{f(x)}$

Basic Form of a Demand Function.

Example: Solve the price-demand functions for x and find the domain of this function.

A) $p = \sqrt{240 - x}$

B) $p = 250e^{-0.3x}$

Definition: **Elasticity of demand** is a measure of how sensitive the demand is to a change in price.

Demand is said to be **elastic** if a small change in the price produces a larger change in the demand.

Demand is said to be **inelastic** if a small change in the price produces a smaller (or no) change in the demand.

Elasticity of demand, $E(p)$, is computed by

$$E(p) = -\frac{\text{Relative rate of change of demand}}{\text{Relative rate of change of price}}$$

	demand is	small change in price produces
$0 < E(p) < 1$		
$E(p) = 1$		
$E(p) > 1$		

Example: A company has determined that the demand for a product is given by

$x = f(p) = 480 - 9p - p^2$

A) Find the elasticity function.

B) Classify the type of elasticity when the price is $15.

C) Classify the type of elasticity when the price is $6.

D) When the price is $6, if the price is increased by 2%, what would be the approximate effect on demand?

E) What price should be charged so that revenue would be maximized?

Example: A company has determined that the demand for a product is given by

$$x = f(p) = 729 - p^2$$

A) Find the elasticity function.

B) Suppose that the price is $20. What would be the approximate effect on demand if the price is decreased by $2?

C) Suppose that the price is $8. What would be the percent change in demand if the price is changed by $1?

D) Find the price where elasticity would be unitary.

E) Give the interval where price is inelastic. Give the interval where price is elastic.