Section 2.7 Marginal Analysis in Business and Economics

# Topic 1: Marginal Cost, Revenue, and Profit

One important application of calculus to business and economics involves *marginal analysis.* In economics, the word *marginal* refers to a rate of change (that is the derivative).

Let *x* represent the number of units of a product produced in some time interval.

If  is the total cost, then **Marginal Cost** is .

If  is the total revenue, then **Marginal Revenue** is.

If  is the total profit, then **Marginal Profit** is .

# Topic 2: Marginal Average Cost, Revenue, and Profit

Let *x* represent the number of units of a product produced in some time interval.

If the average cost is , then

**Marginal Average Cost** is .

If the average revenue is , then

**Marginal Average Revenue** is .

If the average profit is  then

**Marginal Average Profit** is .

It is important to remember that  represents the total cost of producing *x* items, not the cost of producing a single item.

To find the cost of producing a single item, we use the difference of two successive values of :

The total cost of producing  items is .

The total cost of producing *x* items is .

The **exact cost** of producing the  item is 

**Theorem: Marginal Cost and Exact Cost**

If  is the total cost of producing *x* items, then the marginal cost function approximates the exact cost of producing the item:



Similar statements can be made for total revenue functions and total profit functions.

**Topic 3: Application**