Math 53 Lecture: The Cost/Revenue Function and the Marginal Cost/Revenue

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Lecture 3

An application of the derivatives in business and economics is the marginal cost/revenue of a cost/revenue function. Simply put, a cost/revenue function is a function that determines the cost/revenue of a product/service based on some independent factor such as the number of units produced, number of hours served, and the like. Thus the cost/revenue varies with the factor involved. The cost function is usually denoted by $C(x)$ or $C(t)$, while the revenue function is denoted by $R(x)$ or $R(t)$, depending on the description of the independent factor.

The average cost/revenue of a product/service with respect to some interval is computed as the ratio between the difference of the costs/revenues in-between intervals and the difference of the intervals. This is the same as getting the slope of a (secant) line or getting the average velocity of a moving particle. When the difference is very small such that it approaches to zero, we get what is called the **marginal cost/revenue**.

Exercises:

1. The total revenue received from sale of x desks is $R(x)$ dollars, and $R(x) = 200x - \frac{1}{3}x^2$. Find (a) the marginal revenue function; (b) the marginal revenue when $x = 30$; (c) the actual revenue from the sale of the 31st desk.
2. The total cost of manufacturing x watches in a certain plant is given by $C(x) = 1500 + 3x^2$. Find (a) the marginal cost function; (b) the marginal cost when $x = 40$; and (c) the actual cost of manufacturing the 41st watch.

As an ending note, other problems include population logistics, volumes, areas, for as long as it involves a rate of change in the unknown quantity.