# MATH 12002 APPLICATIONS TO ECONOMICS SECTION 3.5

Definitions and Basic facts

1. Cost function: the cost of producing $x$ units of a certain product; Denoted by $C(x)$.
2. Marginal cost: the rate of change of the cost with respect to $x$.
3. Demand function: the function which gives the price per unit that the company can charge if it sells $x$ units; denoted by $p(x)$.
4. Revenue function: $R(x) = xp(x)$.
5. Profit function: $P(x) = R(x) - C(x)$.

Sample Problems

1. For the cost function $C(x) = 680 + 4x + 0.01x^2$, and demand function $p(x) = 12 - \dfrac{x}{500}$ find the production level that will maximize profit.

2. During the summer months Terry makes and sells necklaces on the beach. Last summer he sold the necklaces for \$10 each and his sales averaged 20 per day. When he increased the price by \$1, he found that he lost two sales per day.

   (a) Find the demand function, assuming that it is linear.

   (b) If the material for each necklace costs Terry \$6, what should the selling price be to maximize his profit?

3. An automobile dealer can sell four cars per day at a price of $\$12,000$. He estimates that for each \$200 price reduction he can sell two more cars per day. If each car costs him $\$10,000$, and his fixed costs are $\$1,000$, what price should he charge to maximize his profit? How many cars will he sell at this price?