Math 1090 ~ Business Algebra

Section 3.3 Quadratic Business Applications

Objectives:
• Set up and solve quadratic equations as they apply to business situations.

Quadratic Business Applications
Supply, Demand and Market Equilibrium

Ex 1: If the supply function for a commodity is \( p = q^2 + 8q + 20 \) and the demand function is \( p = 100 - 4q - q^2 \), find the equilibrium quantity and the equilibrium price.
Ex 2: For the last example, if an $8.00 tax is placed on production and passed through the supplier, find the new equilibrium point.

Break-Even Points and Maximization
Ex 3: If a company has total costs $C(x) = 1600 + 1500x$ and the total revenue is $R(x) = (1600 - x)x$, find the break even points.

Break even points occur when $R(x) = C(x) \iff P(x) = 0$
Ex 4: Find the maximum revenue given \( R(x) = 1600x - x^2 \).

Ex 5: Suppose a company has fixed costs of \$4,320,000 and variable costs of \( 0.8x - 4000 \) dollars per unit, where \( x \) is the number of units produced. Suppose further that its selling price is \( 2000 - 1.2x \) dollars per unit.

a) Find the break even point.

b) Find the maximum revenue.

c) Find the maximum profit and the price that yields it.