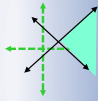$5x-2y \leq 75$

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

$S = Pe^{rt}$

$APY = (1+\frac{r}{n})^{n}-1$

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
$$R(x) = C(x) \Leftrightarrow P(x) = 0$$

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 $0.8 x - 4000$ dollars per unit, where x = the number of units produced. Suppose further that its selling price is $2000 - 1.2 x$ 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.