**1.6: Applications of Functions in Business and Economics**

**Math 111**

**Objective:**

1. **Supply, demand and market equilibrium**
2. **Monopoly market**

***1. Supply, Demand and Market Equilibrium***

**Market equilibrium occurs when the quantity of a commodity demanded is equal to the quantity supplied.**

**Do you think there is a relationship between demand and price? If so what is it?**

**Do you think there is a relationship between supply and price? If so what is it?**

|  |  |
| --- | --- |
| **If the supply and demand curves for a commodity are graphed on the same coordinate system, with the same units, market equilibrium occurs at the point where the curves intersect. The price at that point is the equilibrium price, and the quantity at that point is the equilibrium quantity.** |  |

**Ex1: Find the market equilibrium for the following supply and demand functions. Explain what it means in everyday language.**

**Demand: **

**Supply: **

**Ex2: Find the market equilibrium for the following supply and demand functions. Explain what it means in everyday language.**

**Demand: **

**Supply: **

***1I. Revenue, Cost, Profit, and Breakeven Analysis***

**What is Revenue (in a business context)?**

**What is Cost (in a business context) and what are its two components?**

**What is Profit?**

**Ex3: A manufacturer has fixed costs of $3300 and a variable cost of $5 per item produced.**

1. **Define your variables**
2. **What is the cost function?**
3. **What is the cost if no items are produced?**

**Ex4: Heavenly Cappucino has costs of $3000/mo if they make and sell 1000 drinks and $4200/mo if they produce 2000 drinks. Assuming the costs vary in a linear manner:**

1. **Define your variables**
2. **Find and interpret the slope.**
3. **Find and interpret the *C*-intercept**
4. **Find an equation to model the costs.**
5. **Find and interpret the *n*-intercept**

**Ex5: The cost function for Heavenly Cappuccino was found in the previous example. If the average drink sells for $3.50, how many drinks must they sell to breakeven?**

**Ex6: Suppose the manufacturer from (ex 3) has revenue of .**

1. **Find the profit function.**
2. **Find and interpret **
3. **What is the profit on 351 items?**
4. **How many items must be sold to breakeven?**

**Ex7: The bookstore’s quarterly costs are given by . If they wish to breakeven after selling only 200 texts, what must be the price of the average textbook?**