**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Class Exercise - Linear Functions Supply and Demand**

You have just been hired as a product manager for a manufacturing firm. Your first job is to analyze the data for three products (designated A,B, and C) and make some recommendations.

Your product analysts have supplied you with the price-supply and price-demand equations for all three products, as well as the fixed and variable costs for each product. The data is shown in the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Product** | **Price-supply** | **Price-demand** | **Fixed Cost** | **Variable Cost** |
| A | p = 1.1q | p = 1008 – 3.1q | 50000 | 20 |
| B | p = 1.3q | p = 1127 – 3.6q | 200000 | 15 |
| C | p = 1.9q | p = 1040.3 – 2.14q | 50000 | 22 |

Graph the price-supply and price-demand curves for product A. Estimate where the two functions intersect.



Determine equilibrium quantity and price **ALGEBRAICALLY** showing work for all 3 products.

|  |  |  |
| --- | --- | --- |
| **Product** | **Equilibrium Quantity** | **Equilibrium Price** |
| **A** |  |  |
| B |  |  |
| C |  |  |

Assume that you will be selling each product at its equilibrium price. Determine the cost C(x), revenue R(x), and **SIMPLIFIED** profit P(x) functions for all three products.

|  |  |  |  |
| --- | --- | --- | --- |
| **Product** | **C(x) =** | **R(x) =** | **P(x) =** |
| A |  |  |  |
| B |  |  |  |
| C |  |  |  |

Now, determine the breakeven points for all three products. You must show your work for full credit.

|  |  |
| --- | --- |
| **Product** | **Breakeven** |
| A |  |
| B |  |
| C |  |

If you assume the number of each product you will sell will equal the equal equilibrium demand for the product, how much profit or loss will you make on each? **Show how you arrived at either the profit or loss dollar amount.** Should you go ahead with production of each product?

|  |  |  |
| --- | --- | --- |
| **Product** | **Profit/Loss** | **Go Ahead? (Y or N)** |
| A |  |  |
| B |  |  |
| C |  |  |