Math 202.03 Writing Assignment

For my business I chose to sell tennis balls. Although tennis balls are usually sold in packs of 3, I chose to sell balls by the dozen. The approximate variable cost is $75 per dozen to make, I will refer to them as a package of tennis balls. My total fixed costs for my business are $7,500 per month, so my cost function is C(x) = 7,500 + 75x. I can afford $150,000 in total costs per month, to find how many units I can produce I set 150,000 equal to my cost function and solve for x. After doing so I got the answer of

1,900 units.

Next, I want to find my revenue function, which is R=xp. Where x is the number of golf balls sold and p is price per dozen balls. We can find p by using the price-demand equation, which in my case was P =320-1/30x. So my revenue function is R(x) = x(3201/30x) or R(x) = 320x-1/30x^2.

To find the feasible range of units demanded per month, I simply took the pricedemand function, set it so that is greater than or equal to 0, then solve for x. And I got 9,600 is greater than or equal to 0. So the feasible range is between 0 and 9,600, with 0 and 9,600 being possible.

Now I want to find the profit function, which is R(x) – C(x). So I took my revenue functions minus my cost function. So my profit function is P(x) = -1/30x^2

+245x -7,500.

To find the break even points, you can graph R(x) and C(x) in the same coordinate system. Then find the intersection points, which are the break-even points. So after graphing my cost and revenue functions, and finding the intersection points, I found that my break-even points are 30 and 7,319 units. This means that if I sell 29 units or less I will be incurring a loss in profits and if I sell 7,320 units or more I will also incur a loss in profits.

Finally, I want to find the marginal cost and marginal revenue at 1,000 units. To

find both, we simply take the derivative of each of the functions. The marginal cost function is C’(x) = 75, so it costs an additional $75 to produce one more package of tennis balls. The marginal revenue function is R’(x) = 320-1/30x. We were asked to determine the marginal revenue at a production level of 1,000 units, so I plugged 1,000 into the marginal revenue function, which equaled $286.67. Which means at a production level of 1,000 the approximate change in revenue is $286.67, revenue increases as production increase. By looking at the graph of the cost and revenue functions the local maxima of the graph would be the optimal production level, and in my case that was 4,799 units. But since I can only afford total costs of 150,000 per month, I can only produce 1,900 units, which would still be a profit because I am in-between my breakeven points.

The importance of marginal analysis to business operations is huge. It provides great insight in how to run your company. It lets management know how many units they can produce and still make a profit, furthermore the actual marginal analysis lets management know how much more it would cost to produce one more item or how much the revenue will change if production changes. All of this analysis is the backbone of a company and helps management run the company and make decisions.

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