

Assignment #9 continued

(78.) Marginal Cost, Revenue, and Profit

Step 1: Find Marginal Cost. I know that Cost = $C(x) = 165.46x^{-0.4789}$, So the marginal cost is $C'(x)$.

$$\begin{aligned} \frac{d}{dx} 165.46x^{-0.4789} &= -0.4789(165.46)x^{(-0.4789-1)} \\ &= -79.238794x^{-1.4789} \end{aligned}$$

Marginal Cost is $C'(x) = -79.238794x^{-1.4789}$

Step 2: Find Marginal Revenue. $R(x) = 63.25x$ so marginal revenue = $R'(x)$

$$\begin{aligned} \frac{d}{dx} 63.25x &= 2ax + b \quad \text{where } ax^2 + bx + c = y \\ 2(0)(x) + 63.25 & \quad a=0 \quad b=63.25 \quad c=0 \\ &= 63.25 \end{aligned}$$

Marginal Revenue = \$63.25

Step 3: Find Marginal Profit. $P(x) = R - C$

$$P(x) = 63.25x - 165.46x^{-0.4789}$$

So, marginal profit is $P'(x)$

$$\frac{d}{dx} 63.25x - 165.46x^{-0.4789} = 63.25 + 79.238794x^{-1.4789}$$

Marginal Profit = $63.25 + 79.238794x^{-1.4789}$

I know both of these are the derivative b/c of the work I've done previously in this problem