

Example

Similar to question 13, 14 from ws#1 9(ex6-8)

Hathaway Motors currently sell an average of 20 cars each week at a price of \$6400 each. The sales department wants to increase the price, but the marketing department predicts that for every \$300 increase, sales will fall by one car. If the dealer cost (cost to the dealer) for each car is \$4000, what price will maximize profits?



$$\text{Profit} = (\# \text{ of cars sold}) (\text{Selling Price}) - 4000 (\# \text{ of cars sold})$$

Let x Rep. # of \$300 increases

$$P = (20 - 1x)(6400 + 300x) - 4000(20 - x)$$

$$P = 128000 + 6000x - 6400x - 300x^2 - 80000 + 4000x$$

$$P = -300x^2 + 3600x + 48000$$

$$P = -300(x^2 - 12x + 36) + 48000 + 10800$$

$$P = -300(x - 6)^2 + 58800$$

$$V(6, 58800) \Rightarrow \text{Selling Price} = 6400 + 6(300) = \underline{\underline{\$8200}}$$

$$P = -300(n-6)^2 + 58800$$

The maximum value of P is \$58000 when $n=6$

Therefore, the price that will maximize profits is

$$\begin{aligned} & \text{old price} + 6(\text{increases of } \$300 \text{ each}) = \\ & = \$6400 + 6(\$300) \\ & = \$8200 \end{aligned}$$

HOMework...

Worksheet - Applications of Maximum_Minimum.doc

