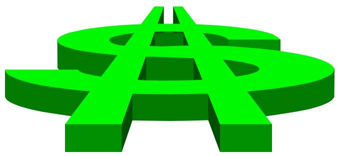
Price For Maximizing Profit



by Ted Mitchell

Learning Goal

- Finding the Price that Maximizes the Profit is not necessarily the same as finding the Price that Maximizes Revenue

Revenue - total Variable Cost - Fixed Cost = Profit

$R - VQ - F = Z$

$PQ - VQ - F = Z$

$Z = PQ - VQ - F$

Expand The Profit Equation

$Z = PQ - VQ - F$

substitute $Q = a - bP$

$Z = P(a-bP) - V(a-bP) - F$

$Z = aP - bP^2 - aV + bPV - F$

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Consider the Fixed Costs

$Z = aP - bP^2 - aV + bPV - F$

Consider the Variable Costs

Consider the Fixed Costs

$Z = aP - bP^2 - aV + bPV - F$

Consider the Revenue

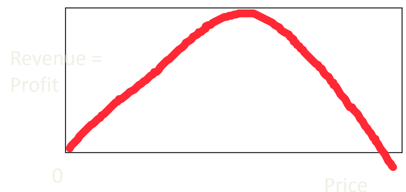
Consider the Variable Costs

Consider the Fixed Costs

Revenue looks like

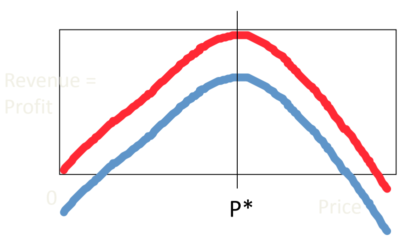
$R = aP - bP^2$

With zero costs Revenue = Profit



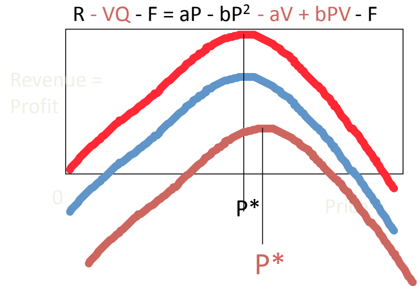
Subtract Fixed Costs from Revenue

$R - F = aP - bP^2 - F$



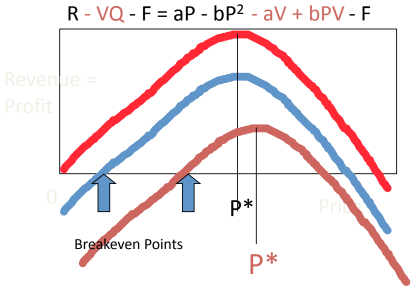
Subtract Variable Costs from Revenue

$R - VQ - F = aP - bP^2 - aV + bPV - F$



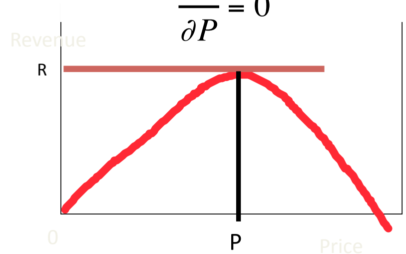
Subtract Variable Costs from Revenue

$R - VQ - F = aP - bP^2 - aV + bPV - F$



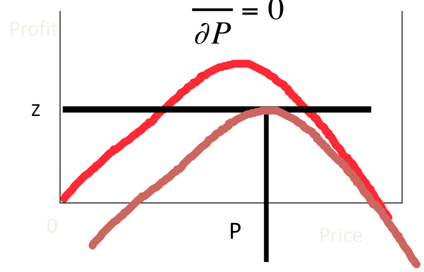
Slope of Revenue Curve is Zero

$$\frac{\partial R}{\partial P} = 0$$



Slope of Profit Curve is Zero

$$\frac{\partial Z}{\partial P} = 0$$



Example Exam Question

- The Demand is estimated by market research to be
- Q = 5,000 – 500P
- The variable cost per unit is, V = $2
- The fixed cost for the period is, F = $1,000
- What is the selling price that will maximize the Profit?

Example Exam Question

- The Demand is estimated by market research to be
- Q = 5,000 – 500P
- The variable cost per unit is, V = $2
- The fixed cost for the period is, F = $7,000
- What is the selling price that will maximize the Profit?
- **First build the Profit Equation, Z**
  The Revenue is R = P(a-bP^2) = P(5,000-500P)
- The Profit is Z = R – VQ – F
- Z = P(5,000-500P) – 2(5,000-500P) – 7,000
- Z = 5,000P – 500P^2 -10,000+1000P – 7,000

Example Exam Question

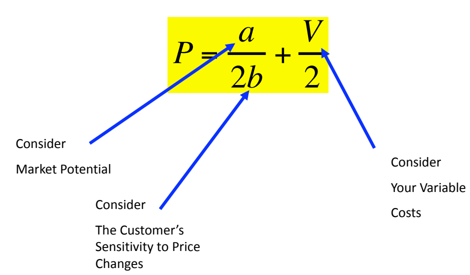
- The Demand is estimated by market research to be
- Q = 5,000 – 500P
- The variable cost per unit is, V = $2
- The fixed cost for the period is, F = $7,000
- What is the selling price that will maximize the Profit?
- **Second: Find the first derivative wrt P,**
- Z = 5,000P – 500P^2 -10,000 + 1,000P – 7,000
- dZ/dP = 5,000 –2(500)P +1,000, **set dZ/dP= 0**
- 5,000 –2(500)P +1,000 = 0 , **solve for P**
- –2(500)P = -5,000 -1,000 =
  P = 6,000/1,000 = $6

The General Solution for Finding Optimal Price for Max Profit

- Establish the Profit equation
- Z = aP - bP^2 - aV + bPV – F
- Find the first derivative of the profit equation
- dZ/dP = a – 2bP – bV
- Set the first derivative equal to zero
- dZ/dP = a – 2bP – bV = 0
- Solve for the optimal price
- P = a/2b + bV/2b = a/2b + V/2b

The Price That Maximizes Profit

$$P = \frac{a}{2b} + \frac{V}{2}$$



The Price That Maximizes Profit

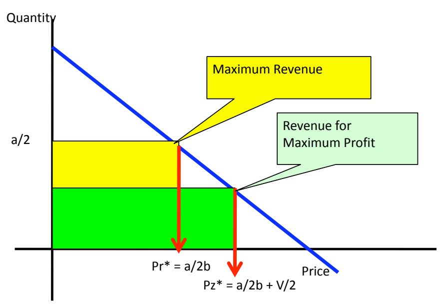
$$P = \frac{a}{2b} + \frac{V}{2}$$

P = (Price that maximizes revenue) + (Half of the Variable Cost)

The Price That Maximizes Profit

$$P = \frac{a}{2b} + \frac{V}{2}$$

Is always equal to or higher than the price that maximizes sales revenue!



The Price That Maximizes Profit

$$P = \frac{a}{2b} + \frac{V}{2}$$

Says if you get an increase in your variable costs pass half of it on to the customer.

The Price That Maximizes Profit

$$P = \frac{a}{2b} + \frac{V}{2}$$

Note: It Says

Do NOT change your price just because you get an increase in your fixed costs!