Revenue Applications

A health club charges $30 per month and currently has 1500 customers. For each $1 increase in price, the number of customers will decrease by 25. How much should the company charge in order to maximize monthly revenue? What is the maximum monthly revenue?

Revenue = Cost • #Customers

X = # of price increases

$R(x) = (30 + 1x)(1500 - 25x)$

Put in standard form using FOIL

$R(x) = 45000 - 750x + 1500x - 25x^2$

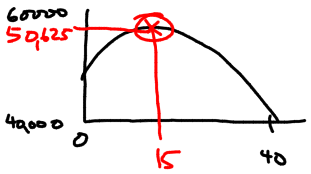
$R(x) = -25x^2 + 750x + 45000$

Find vertex: $x = \frac{-b}{2a} = \frac{-750}{2(-25)} = \frac{-750}{-50} = 15$

15 increases of $1 = $15 increase

New price = 30 + 15 = $45

New revenue: $R(15) = -25(15)^2 + 750(15) + 45000$



$= -25(225) + 11250 + 45000$

$= -5625 + 11250 + 45000$

$= \$50,625$

An online music store sells about 4000 songs each day when it charges $1 per song. For each $0.05 increase in price, about 80 fewer songs per day are sold. Find how the store can maximize daily revenue.

$R(x) = Cost \cdot \#Customers$

X = # of $0.05 increases

$R(x) = (1 + 0.05x)(4000 - 80x)$

FOIL: $4000 - 80x + 200x - 4x^2$

$R(x) = -4x^2 + 120x + 4000$

$x = \frac{-b}{2a} = \frac{-120}{2(-4)} = \frac{-120}{-8} = 15$ increases

New price = $1 + 15(0.05) = $1.75

New revenue $= -4(15)^2 + 120(15) + 4000$

$= -4(225) + 1800 + 4000$

$= -900 + 1800 + 4000$

$= \$4900$