QEQFII L7 MaxMin Problems Revenue

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Lesson 7 Max/Min Problems (Revenue)

1.) A student newspaper has 500 subscribers who pay $6.00/year. For every $0.25 decrease they would sell 50 more subscriptions. Determine the maximum revenue possible and the price at which this would occur.

Let n be # of decreases

$$\text{Revenue} = (\text{cost})(\#\text{ sold})$$
$$= \underbrace{(6 - 0.25n)(500 + 50n)}_{\text{original values}}$$
$$= 3000 + 300n - 125n - 12.5n^2$$
$$R = -12.5n^2 + 175n + 3000$$

$$n = \frac{-b}{2a}$$
$$n = \frac{-175}{2(-12.5)}$$
$$n = 7 \rightarrow \#\text{ of decreases}$$

cost
$6 - 0.25n$
$6 - 0.25(7)$
$\$4.25$

$$R = (4.25)(500 + 50(7))$$
$$= (4.25)(850)$$
$$= \$3612.50$$

2.) Sponsors of a design show believe 600 people will attend if the price is $6.00 per ticket. They assume that 25 fewer people would attend for each $0.50 increase in price. Determine the price that will produce a maximum revenue and how many people would attend.

Let n be # of increases

$$R = (600 - 25n)(6 + 0.50n)$$
$$R = 3600 + 300n - 150n - 12.5n^2$$
$$= -12.5n^2 + 150n + 3600$$

Vertex formula
$$n = \frac{-b}{2a}$$
$$= \frac{-150}{2(-12.5)}$$
$$= 6$$

# of ppl
$600 - 25(6)$
450

price
$6 + 0.5(6)$
$\$9$

Max revenue $= 450 \cdot 9$
$= \$4050$