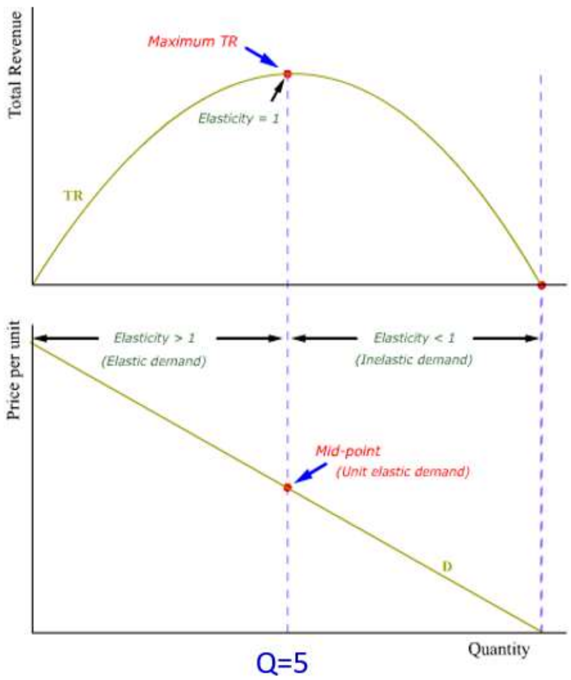
Quadratic function: revenue function/break even analysis



$$\left|\frac{\%\Delta Q}{\%\Delta P}\right| : \begin{array}{lll} >1 & ; & elastic \\ =1 & ; & unit\ elastic \\ <1 & ; & inelastic \end{array}$$

Revenue maximizing output:
unit elasticity

Profit-maximizing output:
under region with **elastic** demand

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DO NOT C

Exrcise 2B. Consider a function that relates tax revenues R, in billions of dollars, to the average tax rate t such that $R = 350t - 500t^2$.

(a) What tax rate(s) is consistent with raising tax revenues equal to \$60 billion?

(b) What tax rate(s) is consistent with raising tax revenues equal to \$61.25 billion?

(c) What tax rate is consistent with the maximum tax revenue?

(a) $350t - 500t^2 = 60$

$= 500t^2 - 350t + 60$

$= 50t^2 - 35t + 6$

$= (5t-2)(10t-3)$

$t = \frac{2}{5}, \frac{3}{10}$

(b) $350 - 500t^2 = 61.25$

$= 500t^2 - 350t + 61.25$

using $\frac{-b \pm \sqrt{b^2-4ac}}{2a} = \frac{350 \pm \sqrt{(350)^2 - 4(500)(61.25)}}{2(500)}$

So, $t = \frac{7}{20}$

(c) max $R(t)$: $R = 350t - 500t^2$

$= 350 - 1000t$

$t = \frac{350}{1000} = 0.35$