HOMEWORK 4

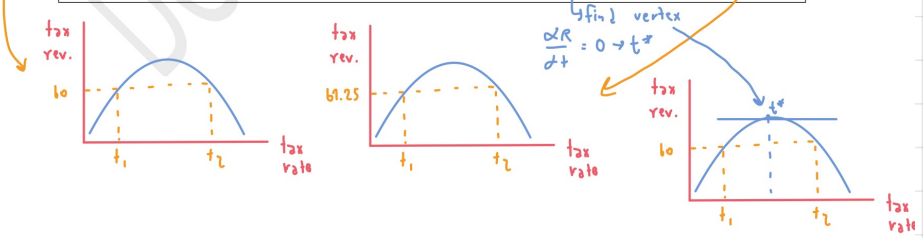
HW

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? find t_1 & t_2 } same

(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? find t^*



(a) tax = \$60

$R = 350t - 500t^2$

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

$= -10(50t^2 - 35t + 6)$

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

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

$= 0.4, 0.3$

(c) find t^*

$\frac{dR}{dt} = 0$

$350 - 1000t = 0$

$-1000t = -350$

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

$t^* = 0.35$

(b) tax = \$61.25

$R = 350t - 500t^2$

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

$= 500t^2 - 350t + \frac{245}{4}$

$= \frac{1}{4}(200t^2 - 1400t + 245)$

$= \frac{1}{4} \times 5(400t^2 - 280t + 49)$

$= \frac{1}{4} \times 5(20t - 7)^2$

$= \frac{1}{4} \times 5(20t - 7)^2$

$= 1.25(20t - 7)^2$

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