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)
$$350t - 500t^2 = 60$$
$$-500t^2 + 350t - 60 = 0$$
$$50t^2 - 35t + 6 = 0$$
$$t = 0.3, 0.4$$

Tax rate of 30% and 40% will yields 60M government revenue. #

b)
$$350t - 500t^2 = 61.25$$
$$-500t^2 + 350t - 61.25 = 0$$
$$t = 0.35$$

Tax rate of 35% will yields 60M government revenue. #

c) Maximize government revenue:

$$\frac{\partial R}{\partial t} = 0$$
$$\frac{\partial}{\partial t}(350t - 500t^2) = 0$$
$$350 - 1{,}000t = 0$$
$$t = \frac{350}{1{,}000}$$
$$= 0.35$$

Tax rate that maximize the government revenue is 35 percent. #