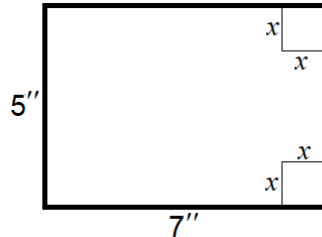# Calculus

Practice Test 2

Problem 1.- An input tray is a box open at one side, where people can put envelopes to be processed. It is built out of a sheet of metal, as shown in the figure. The squares at the corners are cut out and the flaps folded to make the tray. Calculate the value of x, so the tray contains the most possible volume.

Problem 2.- Use the L'Hospital rule to find the following limits if they exist.

a) $Lim_{x \to 0} \ln(1 - \cos x) - \ln x^2$

b) $Lim_{x \to \infty} \dfrac{1 + 5x^2 + 4x^3}{1 + 5x + 4x^2}$

Problem 3.- Maxima and minima. Find the maxima and minima of the following function
$$f(x) = 2x^3 + 3x^2 - 36x + 5$$

Problem 4.- Use Newton's method to find a solution to the equation between $x = 1$ and 2.

$5 + 4\cos x - 3x = 0$

Problem 5.- Calculate the antiderivative of the function $\qquad f(x) = \sec^2 x + \sec x \tan x$

Problem 6.- Sketch the derivative of the function shown in the graph