Write a program that calculates the values of the following piece-wise defined function and its derivative:

(1)
$$f(x)=\begin{cases} x, & x<1 \\ -x^2+3x-1, & 1\le x<2 \\ 3-x, & x\ge 2 \end{cases}$$

(2)
$$f'(x)=\begin{cases} 1, & x<1 \\ -2x+3, & 1\le x<2 \\ -1, & x\ge 2 \end{cases}$$

Your program should ask the user for a real number x and print out f(x) and f'(x) to the screen. Naturally you will have to use if-else structures to calculate the values of the functions. Include in your report the print-outs from your program when it is run using the following values for x: 0.5, 1.5 and 2.