Q1. Find the critical points and the extreme values of the function given by

\[ f(x) = \begin{cases} 
3 - x, & x < 0 \\
3 + 2x - x^2, & x \geq 0 
\end{cases} \]

Q2. Check the conditions of the mean value theorem for

\[ f(x) = \sqrt{x(1-x)}. \]

Q3. Given that \( f'(x) = 1 - \frac{4}{x^2} \) find the intervals where \( f \) is increasing, decreasing and its extreme values.

Q4. If \( b, c, d \) are constants, for what value of \( b \) will the curve \( y = x^3 + bx^2 + cx + d \) have a point of inflection at \( x = 1 \).