1. Use the first derivative test to classify the stationary points for the following functions: $f(x) = 2 - x - x^2$, $g(x) = x^3 - 3x^2 - 72x + 9$.

2. Let $f(x) = \begin{cases} x & 0 \le x < 1 \\ 1 & x \ge 1 \end{cases}$

Identify the absolute and local extrema for the function.

3. Let $f(x) = \sqrt{4x - 3}$. Find $k \in [1, 3]$ that satisfies the mean value theorem.

4. *Grofers* determines that their sales S as a function of ad spending (x) is given by: $S = -0.005x^3 + 1.5x^2 + x + 500$. Find out the inflection points (if any) and interpret them.