1. Define

\[ g(x) := \begin{cases} 
2 - x, & \text{if } 0 \leq x \leq 1; \\
-(x-1)^2, & \text{if } 1 < x \leq 2. 
\end{cases} \]

Note that \( g(0) = 2 \) and \( g(2) = -1 \), so that 0 lies between \( g(0) \) and \( g(2) \). Is there a number \( c \) in the interval \((0, 2)\) such that \( g(c) = 0 \)? If so, explain why. If not, explain why this does not contradict the Intermediate Value Theorem.