

Let $f \in C^1[a, b]$, $f(a) = 0$ and suppose that $\lambda \in \mathbb{R}$, $\lambda > 0$, is such that

$$|f'(x)| \leq \lambda |f(x)|$$

for all $x \in [a, b]$. Is it true that $f(x) = 0$ for all $x \in [a, b]$?