Let $f, g : \mathbb{R} \longrightarrow \mathbb{R}$ be continuous functions such that g is differentiable. Assume that $\big(f(0) - g'(0)\big)\big(g'(1) - f(1)\big) > 0$. Show that there exists a point $c \in (0, 1)$ such that $f(c) = g'(c)$.