The function $f : \mathbb{R} \to \mathbb{R}$ is twice differentiable and satisfies $f(0) = 2$, $f'(0) = -2$ and $f(1) = 1$. Prove that there exists a real number $\xi \in (0, 1)$ for which

$$f(\xi) \cdot f'(\xi) + f''(\xi) = 0.$$