7. Let $f(x)$ be defined as

$$f(x) = \begin{cases} \dfrac{\tan x}{x}, & \text{if } x \neq 0; \\ 1, & \text{if } x = 0 \end{cases}$$

and let $g(x) = f(x) - 1$. Then $g(x)$ is continuous at $x = 0$ and, in fact, $g(x)$ has derivatives of all orders at $x = 0$. Determine the multiplicity of the root $g(x)$ has at $x = 0$. Hint: Apply Taylor's Theorem.