3. Suppose p is a root of $f(x)$ of multiplicity 2. We know that Newton's method ($p_{n+1} = p_n - \dfrac{f(p_n)}{f'(p_n)}$) has order of convergence $\alpha = 1$. Show that if we generate a sequence $\{p_n\}$ by $p_{n+1} = p_n - 2\dfrac{f(p_n)}{f'(p_n)}$ and if this sequence converges to p, then the order of convergence is $\alpha = 2$.