CS730 Assignment #2

Consider the unconstrained Newton method

$$x_{i+1} = x_i - \left(f''(x_i)\right)^{-1} f'(x_i)$$

for solving

$$\min_{x \in R^1} \quad f(x)$$

where $f : R^1 \to R^1$ satisfies the following assumptions:

1. $f''(x) \geqq m > 0$, for all x in R^1.
2. $|f''(y) - f''(x)| \leqq R\, |y - x|$, for all x, y in R^1, for some $R > 0$.

Does the method converge to the global minimum solution $\bar{x}$ from any starting point in R^1 ?

Prove your claim or construct a counterexample.