$g \in C^1([a,b]), \quad x, y \in [a,b]$

mean value theorem: $g(y) - g(x) = g'(z)(y-x)$:

$$|g(x) - g(y)| \leq \underbrace{\max_{z \in [a,b]} |g'(z)|}_{M} \, |y - x|$$

$x = x_k, \; y = x_{k-1}, \quad |\underbrace{x_{k+1}}_{g(x_k)} - \underbrace{x_k}_{g(x_{k-1})}| \leq M |x_k - x_{k-1}|$

$$x_k = e_0 + e_1 + \dots + e_k$$

$$e_0 = x_0$$
$$e_k = x_k - x_{k-1}$$

$$|e_k| \leq M^{k-1} |x_0 - x_1| \qquad (M < 1)$$

$$(*) \quad \sum_{k=1}^{\infty} |e_k| < \infty \Rightarrow \sum_{k=0}^{n} e_k \to x^*$$

$$(*) \quad \sum_{k=1}^{\infty} |e_k| \leq \sum_{k=1}^{\infty} M^{k-1} |x_0 - x_1| = |x_0 - x_1| \sum_{k=0}^{\infty} M^k$$

$$= |x_0 - x_1| \frac{1}{1 - M}$$

$$g\left(\sum_{k=0}^{n} e_k\right) \longrightarrow g(x^*)$$

Kan bare være ett fikspunkt!
Anta $x = g(x)$, $y = g(y)$:
$|g(x) - g(y)| = |x - y| \leq M|x - y|$
går ikke, for $M < 1$.