

HW 2

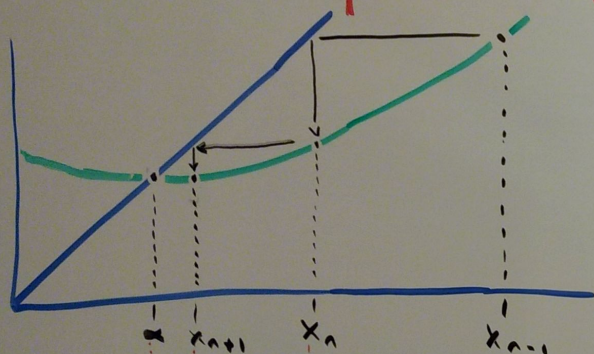
3

α IS FIXED POINT

$$\text{MAXIMUM } |g'(x)| = k \leq 1$$

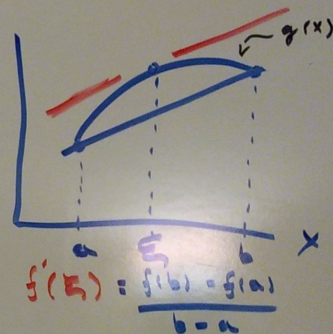
PROVE:

$$|\alpha - x_{n+1}| \leq \frac{k}{1-k} |x_{n+1} - x_n|$$



$$|\alpha - x_{n+1}|$$

$$|x_{n+1} - x_n|$$



$$g(b) - g(a) = f'(\xi)(b - a)$$

ASSUME α_1 & α_2 ARE TWO FIXED POINTS IN $[a, b]$

$$|\alpha_1 - \alpha_2| = |g(\alpha_1) - g(\alpha_2)|$$

$$\stackrel{\text{MVT}}{=} |g'(\xi) \cdot (\alpha_1 - \alpha_2)|$$

$$\rightarrow |g'(\xi) \cdot (\alpha_1 - \alpha_2)| \leq k |\alpha_1 - \alpha_2|$$

WHAT YOU DON'T DO
TODAY

YOU WILL NEVER
HAVE ANOTHER OPPORTUNITY
TO DO