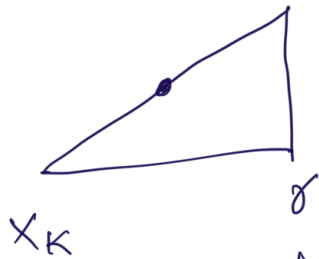


$$e_{k+1} = |g(x_k) - g(r)|$$



$$g'(\xi) = \text{slope}$$

$$= \frac{g(r) - g(x_k)}{x_k - r}$$

$$|g(r) - g(x_k)|$$

$$= g'(\xi) (x_k - r)$$

$$e_{k+1} = |g'(\xi) (x_k - r)|$$

$$= |g'(\xi)| \underbrace{|x_k - r|}_{e_k}$$

$$\boxed{e_{k+1} \leq |g'(\xi)| e_k}$$

$$|g'(\xi)| < 1 \Rightarrow \text{convergence}$$