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$\lim_{n\to\infty} \left|\frac{x_{n+1}-\alpha}{x_n-\alpha}\right| = K \quad 0<K<1$ zbieżność liniowa

rząd metody $= 1$.

$e_{n+1} \approx K \cdot e_n$

Z4. $\frac{1}{n^2} \to 0 \qquad e_n = x_n - \alpha = x_n \quad \left(x_n = a_n = \frac{1}{n^2} \right)$.

$$\lim_{n\to\infty} \frac{e_{n+1}}{e_n^2} = \lim_{n\to\infty} \frac{\frac{1}{n+1}}{\frac{1}{n^2}} \qquad \text{rząd} \neq 2$$

Z 8.

Empiryczne ~~szacowanie~~ szacowanie p $\left(\lim \frac{e_{n+1}}{e_n^p} \right)$

na str. 3 $\quad p \approx \frac{\log|(x_{n+1}-r)(x_n-r)|}{\log|(x_n-r)(x_{n-1}-r)|} = \frac{\log|\varepsilon_{n+1}\cdot\varepsilon_n|}{\log|\varepsilon_n\cdot\varepsilon_{n-1}|}$

Z7. Dahlquist, Björck

$$(1) \quad p \approx \frac{\log|(x_{n+1}-r)(x_n-r)|}{\log|(x_n-r)(x_{n-1}-r)|} \qquad e_{n-1} \approx K \cdot e_{n-2}^p$$

$$e_{n+1} \approx K\cdot e_n^p \approx K \cdot (K\cdot e_{n-1}^p)^p = K^{p+1}\cdot e_{n-1}^{p^2} =$$
$$= K^{p+1}(K\cdot e_{n-2}^p)^{p^2} =$$
$$= K^{p^2+p+1}\cdot e_{n-2}^{p^3}$$

$$\underbrace{|x_n-\alpha| = K\cdot|x_{n-1}-\alpha|}_{\text{znane}}{}^p \quad \text{znane z (1)}$$

Z.5 $\quad x_{n+1} = \Phi(x_n) \qquad$ Zadanie $\quad f(\alpha)=0$

Φ zależy od metody $\qquad \Phi(\alpha) = \alpha$

$$\underbrace{\Phi(x_n)}_{\approx x_{n+1}} = \Phi(\alpha) + \Phi'(\alpha)(x_n-\alpha) + \Phi^{(2)}(\alpha)(x_n-\alpha)^2 + \dots + \Phi^{(p-1)}(\alpha)(x_{n-1}-\alpha)^{p-1}$$
$$+ \Phi^{(p)}(\alpha)(x_n-\alpha)^p$$

$$x_{n+1} = \alpha + \Phi^{(p)}(\alpha)(x_n-\alpha)^p$$

$\varepsilon_{n+1} = \Phi^{(p)}(\alpha)\,\varepsilon_n^p \qquad$ prawie koniec