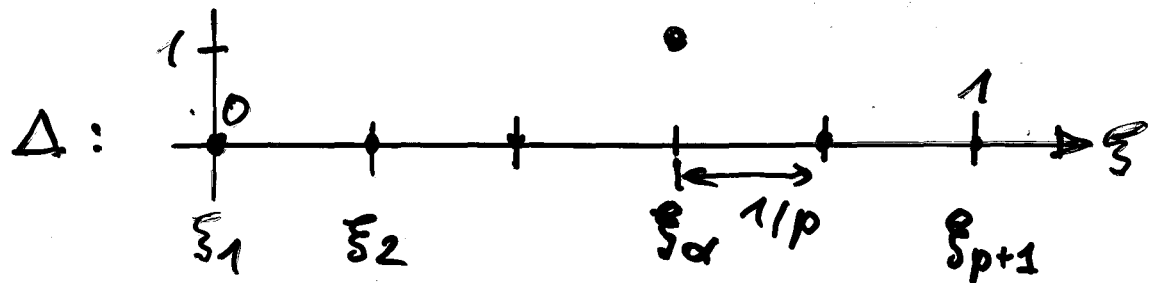


2. Definition der Formfkt. Φ_α auf dem Basiselement Δ :

Teilen das Basiselement Δ in p (gleiche) Teilintervalle:



Ges. $\Phi_\alpha(\xi)$: 1) Polynom p -ten Grades

2) $\Phi_\alpha(\xi_\beta) = \delta_{\alpha\beta}$, $\alpha, \beta = 1, \dots, p+1$

Lösung:

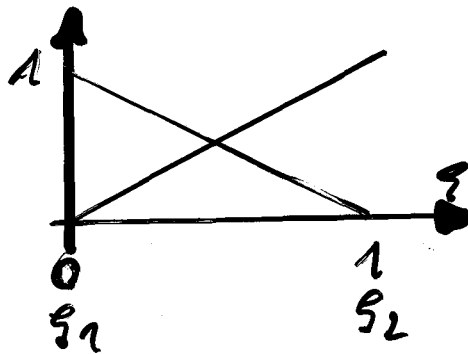
$$\Phi_\alpha(\xi) = \prod_{\substack{\beta=1 \\ \beta \neq \alpha}}^{p+1} \frac{(\xi - \xi_\beta)}{(\xi_\alpha - \xi_\beta)}$$

Beispiele:

Lineares El



$p=1$



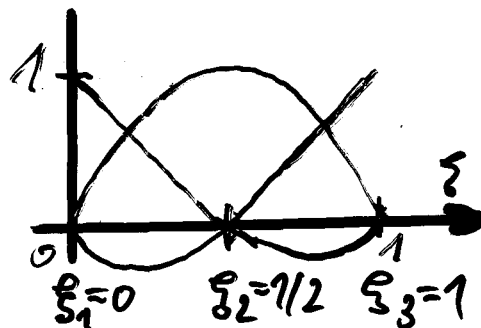
$$\Phi_1 = \Phi_1(\xi) := 1 - \xi$$

$$\Phi_2 = \Phi_2(\xi) := \xi$$

quadrat. Element



$p=2$



$$\Phi_1(\xi) := 2\xi^2 - 3\xi + 1$$

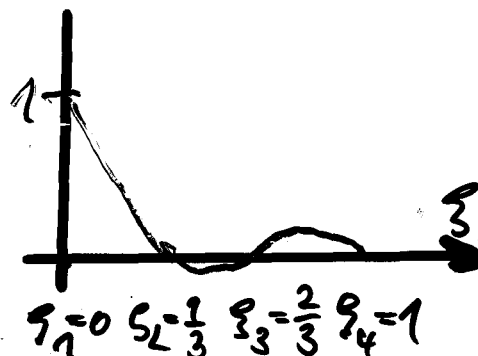
$$\Phi_2(\xi) := -4\xi^2 + 4\xi$$

$$\Phi_3(\xi) := 2\xi^2 - \xi$$

Kubischer Element



$p=3$



$$\Phi_1(\xi) = -\frac{9}{2}(\xi - \frac{1}{3})(\xi - \frac{2}{3})(\xi - 1)$$

$$\Phi_2(\xi) =$$

$$\Phi_3(\xi) =$$

$$\Phi_4(\xi) =$$