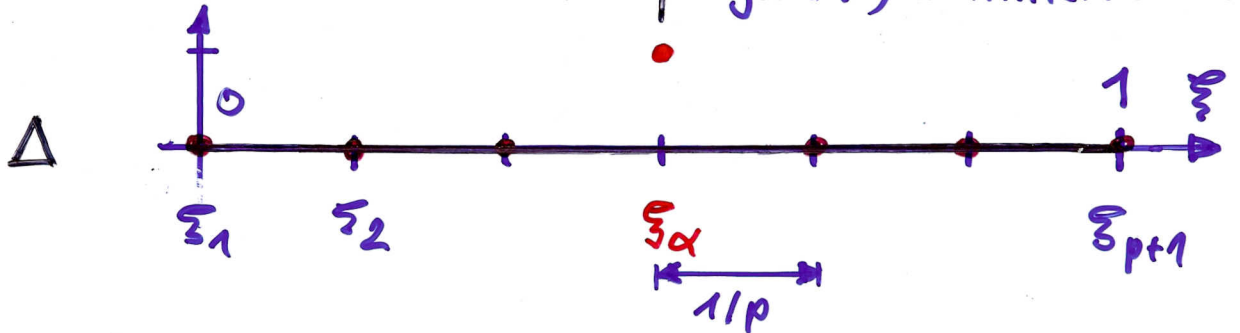


2. Definition der Formfkt. Φ_α auf dem Basiselement Δ :
Teilen dazu Basisel. Δ in p (gleiche) Teilintervalle:



Ges.: $\Phi_\alpha(\xi)$: 1) Polynom p -ten Grades: $\Phi_\alpha \in \mathbb{P}_p$
 \updownarrow
 ξ_α
 2) $\Phi_\alpha(\xi_\beta) = \delta_{\alpha\beta}$, $\alpha, \beta = \overline{1, p+1}$

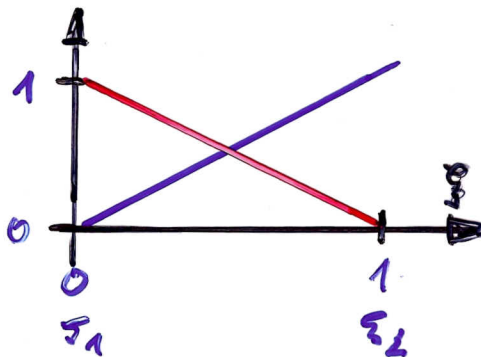
Lösung:

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

Beispiele:

lin. El.

$p=1$

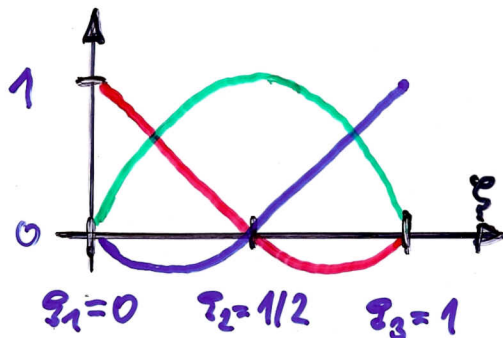


$\Phi_1 = \Phi_1(\xi) := 1 - \xi$

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

quadrat. Element

$p=2$



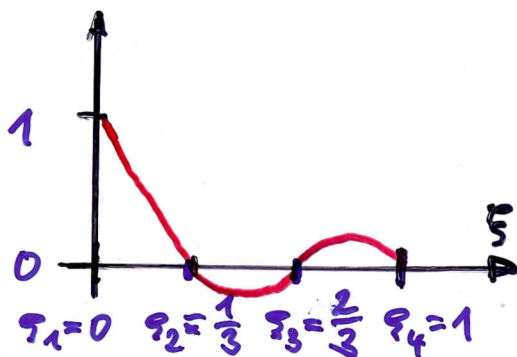
$\Phi_1(\xi) := 2\xi^2 - 3\xi + 1$

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

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

Kubisches Element

$p=3$



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

$\Phi_2(\xi) :=$

$\Phi_3(\xi) :=$

$\Phi_4(\xi) :=$