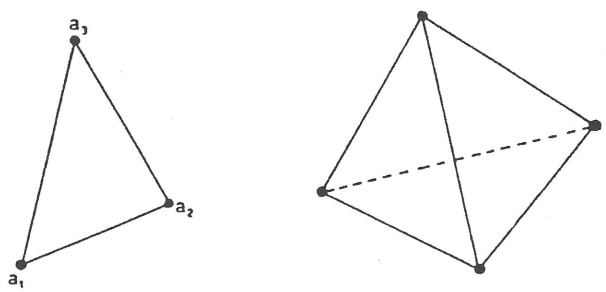
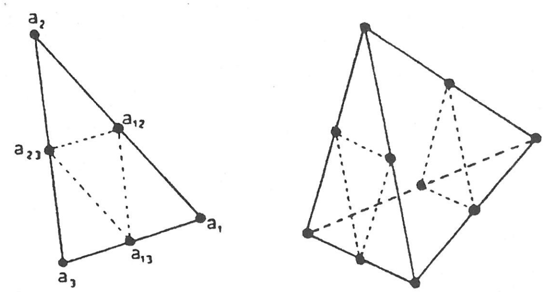


linear triangle, or *Courant's triangle*, $\dim P_T = 3$

linear tetrahedron $\dim P_T = 4$

linear n-simplex
$P_T = P_1(T)$, $\dim P_T = (n+1)$ $\Sigma_T = \{p(a_i): 1 \leqslant i \leqslant n+1\}$

FIG. 6.1

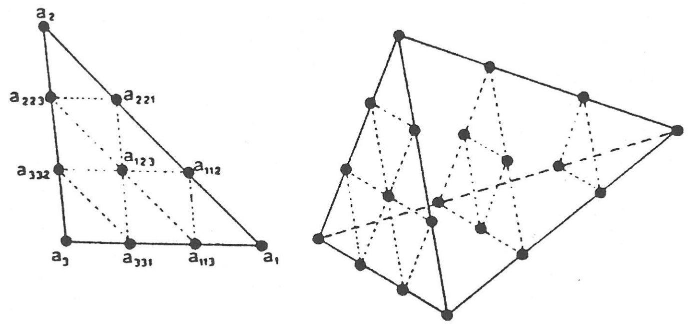


quadratic triangle $\dim P_T = 6$

quadratic tetrahedron $\dim P_T = 10$

quadratic n-simplex
$P_T = P_2(T)$, $\dim P_T = \frac{1}{2}(n+1)(n+2)$ $\Sigma_T = \{p(a_i): 1 \leqslant i \leqslant n+1;\ p(a_{ij}): 1 \leqslant i < j \leqslant n+1\}$

FIG. 6.2.

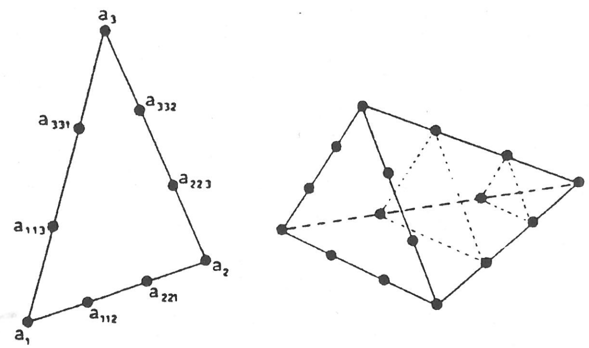


cubic triangle $\dim P_T = 10$

cubic tetrahedron $\dim P_T = 20$

cubic n-simplex
$P_T = P_3(T)$, $\dim P_T = \frac{1}{6}(n+1)(n+2)(n+3)$ $\Sigma_T = \{p(a_i): 1 \leqslant i \leqslant n+1;\ p(a_{iij}): 1 \leqslant i,j \leqslant n+1, i \neq j;$ $p(a_{ijk}): 1 \leqslant i < j < k \leqslant n+1\}$

FIG. 6.3.

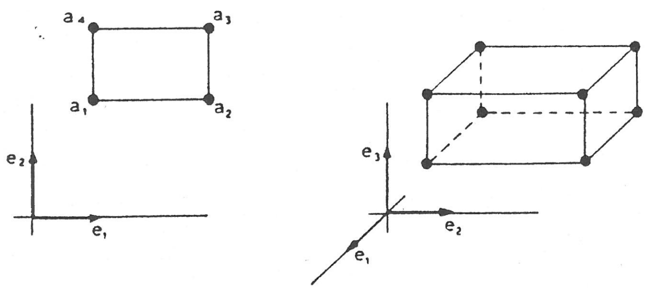


reduced cubic triangle $\dim P_T = 9$

reduced cubic tetrahedron $\dim P_T = 16$

reduced cubic n-simplex
$P_T = P'_3(T)$ (cf. (6.12)), $\dim P_T = (n+1)^2$ $\Sigma_T = \{p(a_i): 1 \leqslant i \leqslant n+1;\ p(a_{iij}): 1 \leqslant i,j \leqslant n+1, i \neq j\}$

FIG. 6.4.

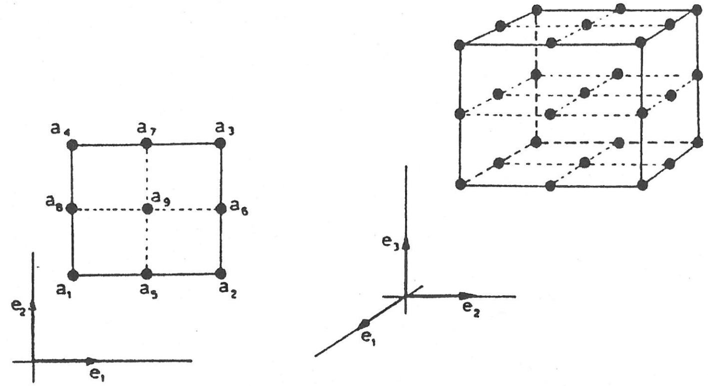


bilinear, or *4-node, rectangle*
dim $P_T = 4$

3-rectangle of degree 2
dim $P_T = 8$

n-rectangle of degree 2
$P_T = Q_1(T)$, dim $P_T = 2^n$ $\Sigma_T = \{p(a): a \in M_1(T)\}$ (cf. (7.6))

FIG. 7.1.

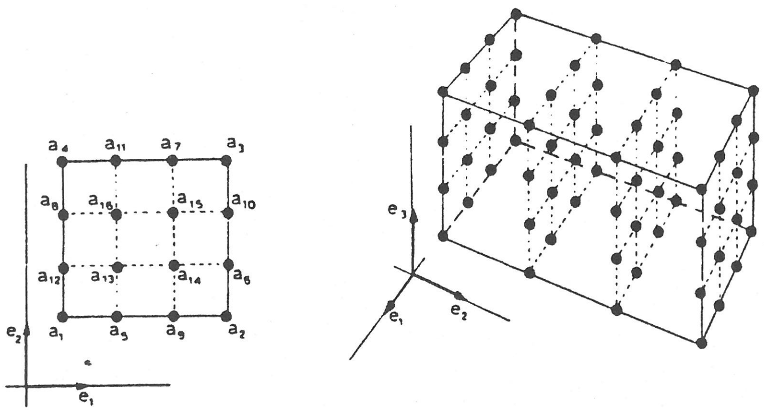


biquadratic, or *9-node, rectangle*
dim $P_T = 9$

3-rectangle of degree 3
dim $P_T = 27$

n-rectangle of degree 3
$P_T = Q_2(T)$, dim $P_T = 3^n$ $\Sigma_T = \{p(a): a \in M_2(T)\}$ (cf. (7.6))

FIG. 7.2.

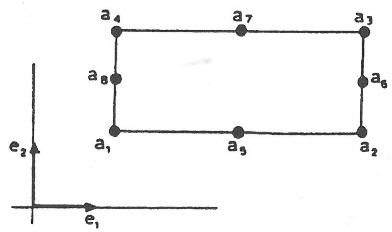


bicubic rectangle
dim $P_T = 16$

3-rectangle of degree 4
dim $P_T = 64$

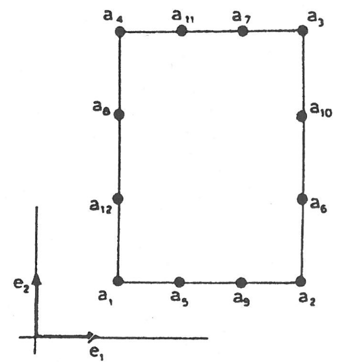
n-rectangle of degree 4
$P_T = Q_3(T)$, dim $P = 4^n$ $\Sigma_T = \{p(a): a \in M_3(T)\}$ (cf. (7.6))

FIG. 7.3.



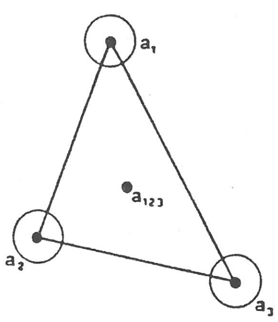
reduced, or *8-node, biquadratic rectangle*
$P_T = Q_2'(T)$ (cf. (7.11)), dim $P_T = 8$ $\Sigma_T = \{p(a_i): 1 \leqslant i \leqslant 8\}$

FIG. 7.4.

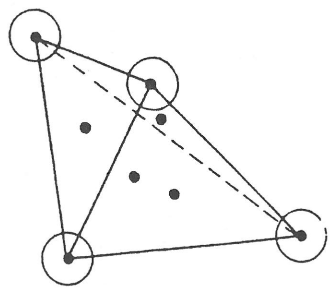


reduced, or *12-node, bicubic rectangle*
$P_T = Q_3'(T)$ (cf. (7.14)), dim $P_T = 12$ $\Sigma_T = \{p(a_i): 1 \leqslant i \leqslant 12\}$

FIG. 7.5.



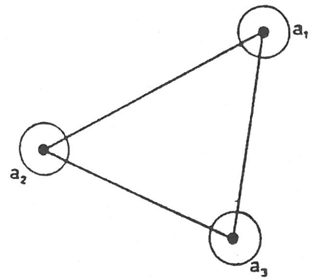
cubic
Hermite triangle
dim $P_T = 10$



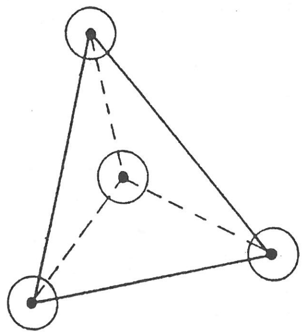
cubic
Hermite tetrahedron
dim $P_T = 20$

cubic Hermite n-simplex
$P_T = P_3(T)$, dim $P_T = \frac{1}{6}(n+1)(n+2)(n+3)$
$\Sigma_T = \{p(a_i): 1 \leqslant i \leqslant n+1;\ p(a_{ijk}): 1 \leqslant i < j < k \leqslant n+1;\ Dp(a_i)(a_j - a_i): 1 \leqslant i, j \leqslant n+1, j \neq i\}$
$\Sigma'_T = \{p(a_i): 1 \leqslant i \leqslant n+1;\ p(a_{ijk}): 1 \leqslant i < j < k \leqslant n+1;\ \partial_j p(a_i): 1 \leqslant i \leqslant n+1, 1 \leqslant j \leqslant n\}$

FIG. 8.1



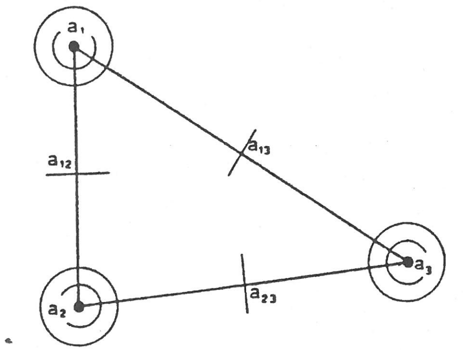
Zienkiewicz triangle, or
reduced cubic Hermite triangle
dim $P_T = 9$



reduced cubic
Hermite tetrahedron
dim $P_T = 16$

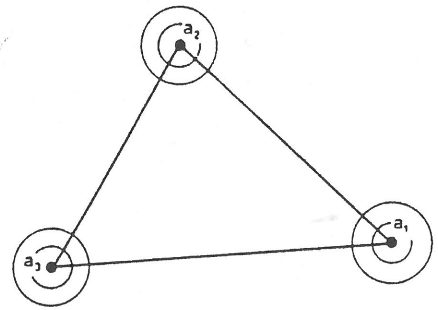
reduced cubic Hermite n-simplex
$P_T = P''_3(T)$ (*cf.* (8.3)), dim $P_T = (n+1)^2$
$\Sigma_T = \{p(a_i): 1 \leqslant i \leqslant n+1;\ Dp(a_i)(a_j - a_i): 1 \leqslant i, j \leqslant n+1, i \neq j\}$,
$\Sigma'_T = \{p(a_i): 1 \leqslant i \leqslant n+1;\ \partial_j p(a_i): 1 \leqslant i \leqslant n+1, 1 \leqslant j \leqslant n\}$.

FIG. 8.2



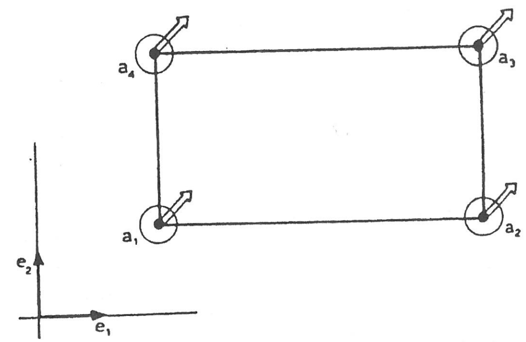
Argyris triangle, or $\mathscr{C}^1$-quintic triangle, or 21-degree of freedom triangle
$P_T = P_5(T)$, dim $P_T = 21$
$\Sigma_T = \{p(a_i), \partial_1 p(a_i), \partial_2 p(a_i), \partial_{11} p(a_i), \partial_{12} p(a_i), \partial_{22} p(a_i): 1 \leqslant i \leqslant 3;\ \partial_\nu p(a_{ij}): 1 \leqslant i < j \leqslant 3\}$
$\Sigma'_T = \{p(a_i): 1 \leqslant i \leqslant 3;\ Dp(a_i)(a_j - a_i): 1 \leqslant i, j \leqslant 3, j \neq i;\ D^2 p(a_i)(a_j - a_i, a_k - a_i): 1 \leqslant i, j, k \leqslant 3, j \neq i, k \neq i;\ \partial_\nu p(a_{ij}): 1 \leqslant i < j \leqslant 3\}$
$\Sigma''_T = \{p(a_i), Dp(a_i)(a_{i-1} - a_i), Dp(a_i)(a_{i+1} - a_i): 1 \leqslant i \leqslant 3;\ D^2 p(a_i)(a_{j+1} - a_j)^2: 1 \leqslant i, j \leqslant 3;\ Dp(a_{ij})\nu_k: \{i, j, k\} = \{1, 2, 3\}, i < j\}$.

FIG. 9.1



Bell triangle, or reduced $\mathscr{C}^1$-quintic triangle, or 18-degree of freedom triangle
$P_T = P'_5(T)$ (cf. (9.2)), dim $P_T = 18$
$\Sigma_T = \{p(a_i), \partial_1 p(a_i), \partial_2 p(a_i), \partial_{11} p(a_i), \partial_{12} p(a_i), \partial_{22} p(a_i): 1 \leqslant i \leqslant 3\}$
$\Sigma'_T = \{p(a_i): 1 \leqslant i \leqslant 3;\ Dp(a_i)(a_j - a_i): 1 \leqslant i, j \leqslant 3, j \neq i;\ D^2 p(a_i)(a_j - a_i, a_k - a_i): 1 \leqslant i, j, k \leqslant 3, j \neq i, k \neq i\}$
$\Sigma''_T = \{p(a_i), Dp(a_i)(a_{i-1} - a_i), Dp(a_i)(a_{i+1} - a_i): 1 \leqslant i \leqslant 3;\ D^2 p(a_i)(a_{j+1} - a_j)^2: 1 \leqslant i, j \leqslant 3\}$

FIG. 9.2.



Bogner–Fox–Schmit rectangle or $\mathscr{C}^1$-bicubic rectangle
$P_T = Q_3$, dim $P_T = 16$
$\Sigma_T = \{p(a_i), \partial_1 p(a_i), \partial_2 p(a_i), \partial_{12} p(a_i): 1 \leqslant i \leqslant 4\}$

FIG. 9.4.