$$N1 := \frac{1}{8}\cdot(1-\xi)\cdot(1-\eta)\cdot(1-\zeta);$$

$$N2 := \frac{1}{8}\cdot(1-\xi)\cdot(1-\eta)\cdot(1+\zeta);$$

$$N3 := \frac{1}{8}\cdot(1+\xi)\cdot(1-\eta)\cdot(1+\zeta);$$

$$N4 := \frac{1}{8}\cdot(1+\xi)\cdot(1-\eta)\cdot(1-\zeta);$$

$$N5 := \frac{1}{8}\cdot(1-\xi)\cdot(1+\eta)\cdot(1-\zeta);$$

$$N6 := \frac{1}{8}\cdot(1-\xi)\cdot(1+\eta)\cdot(1+\zeta);$$

$$N7 := \frac{1}{8}\cdot(1+\xi)\cdot(1+\eta)\cdot(1+\zeta);$$

$$N8 := \frac{1}{8}\cdot(1+\xi)\cdot(1+\eta)\cdot(1-\zeta);$$

$$N1 := \frac{(1-\xi)\,(1-\eta)\,(1-\zeta)}{8}$$

$$N2 := \frac{(1-\xi)\,(1-\eta)\,(1+\zeta)}{8}$$

$$N3 := \frac{(1+\xi)\,(1-\eta)\,(1+\zeta)}{8}$$

$$N4 := \frac{(1+\xi)\,(1-\eta)\,(1-\zeta)}{8}$$

$$N5 := \frac{(1-\xi)\,(1+\eta)\,(1-\zeta)}{8}$$

$$N6 := \frac{(1-\xi)\,(1+\eta)\,(1+\zeta)}{8}$$

$$N7 := \frac{(1+\xi)\,(1+\eta)\,(1+\zeta)}{8}$$

$$N8 := \frac{(1+\xi)\,(1+\eta)\,(1-\zeta)}{8} \qquad \textbf{(1)}$$

$diff(N1, \xi);$
$diff(N2, \xi);$
$diff(N3, \xi);$
$diff(N4, \xi);$
$diff(N5, \xi);$
$diff(N6, \xi);$
$diff(N7, \xi);$
$diff(N8, \xi);$

$$-\frac{(1-\eta)(1-\zeta)}{8}$$

$$-\frac{(1-\eta)(1+\zeta)}{8}$$

$$\frac{(1-\eta)(1+\zeta)}{8}$$

$$\frac{(1-\eta)(1-\zeta)}{8}$$

$$-\frac{(1+\eta)(1-\zeta)}{8}$$

$$-\frac{(1+\eta)(1+\zeta)}{8}$$

$$\frac{(1+\eta)(1+\zeta)}{8}$$

$$\frac{(1+\eta)(1-\zeta)}{8} \quad \textbf{(2)}$$

$diff(N1, \eta);$
$diff(N2, \eta);$
$diff(N3, \eta);$
$diff(N4, \eta);$
$diff(N5, \eta);$
$diff(N6, \eta);$
$diff(N7, \eta);$
$diff(N8, \eta);$

$$-\frac{(1-\xi)\,(1-\zeta)}{8}$$

$$-\frac{(1-\xi)\,(1+\zeta)}{8}$$

$$-\frac{(1+\xi)\,(1+\zeta)}{8}$$

$$-\frac{(1+\xi)\,(1-\zeta)}{8}$$

$$\frac{(1-\xi)\,(1-\zeta)}{8}$$

$$\frac{(1-\xi)\,(1+\zeta)}{8}$$

$$\frac{(1+\xi)\,(1+\zeta)}{8}$$

$$\frac{(1+\xi)\,(1-\zeta)}{8} \qquad \textbf{(3)}$$

$diff(N1, \zeta);$
$diff(N2, \zeta);$
$diff(N3, \zeta);$
$diff(N4, \zeta);$
$diff(N5, \zeta);$
$diff(N6, \zeta);$
$diff(N7, \zeta);$
$diff(N8, \zeta);$

$$-\frac{(1-\xi)\,(1-\eta)}{8}$$

$$\frac{(1-\xi)\,(1-\eta)}{8}$$

$$\frac{(1-\eta)\,(1+\xi)}{8}$$

$$-\frac{(1-\eta)\,(1+\xi)}{8}$$

$$-\frac{(1-\xi)\,(1+\eta)}{8}$$

$$\frac{(1-\xi)\,(1+\eta)}{8}$$

$$\frac{(1+\eta)\,(1+\xi)}{8}$$

$$-\frac{(1+\eta)\,(1+\xi)}{8} \qquad \textbf{(4)}$$

$$n_T := \left[\left[diff(N1,\xi),\ 0,\ diff(N2,\xi),\ 0,\ diff(N3,\xi),\ 0,\ diff(N4,\xi),\ 0,\ diff(N5,\xi),\ 0,\ diff(N6,\xi),\ 0,\ diff(N7,\xi),\ 0,\ diff(N8,\xi),\ 0 \right],\right.$$
$$\left[m_{2,1}, m_{2,2}, m_{2,3}, m_{2,4}, m_{2,5}, m_{2,6}, m_{2,7}, m_{2,8}, m_{2,9}, m_{2,10}, m_{2,11}, m_{2,12}, m_{2,13}, m_{2,14}, m_{2,15}, m_{2,16} \right],$$
$$\left[m_{3,1}, m_{3,2}, m_{3,3}, m_{3,4}, m_{3,5}, m_{3,6}, m_{3,7}, m_{3,8}, m_{3,9}, m_{3,10}, m_{3,11}, m_{3,12}, m_{3,13}, m_{3,14}, m_{3,15}, m_{3,16} \right],$$
$$\left[m_{4,1}, m_{4,2}, m_{4,3}, m_{4,4}, m_{4,5}, m_{4,6}, m_{4,7}, m_{4,8}, m_{4,9}, m_{4,10}, m_{4,11}, m_{4,12}, m_{4,13}, m_{4,14}, m_{4,15}, m_{4,16} \right],$$
$$\left[m_{5,1}, m_{5,2}, m_{5,3}, m_{5,4}, m_{5,5}, m_{5,6}, m_{5,7}, m_{5,8}, m_{5,9}, m_{5,10}, m_{5,11}, m_{5,12}, m_{5,13}, m_{5,14}, m_{5,15}, m_{5,16} \right],$$
$$\left[m_{6,1}, m_{6,2}, m_{6,3}, m_{6,4}, m_{6,5}, m_{6,6}, m_{6,7}, m_{6,8}, m_{6,9}, m_{6,10}, m_{6,11}, m_{6,12}, m_{6,13}, m_{6,14}, m_{6,15}, m_{6,16} \right],$$
$$\left[m_{7,1}, m_{7,2}, m_{7,3}, m_{7,4}, m_{7,5}, m_{7,6}, m_{7,7}, m_{7,8}, m_{7,9}, m_{7,10}, m_{7,11}, m_{7,12}, m_{7,13}, m_{7,14}, m_{7,15}, m_{7,16} \right],$$
$$\left[m_{8,1}, m_{8,2}, m_{8,3}, m_{8,4}, m_{8,5}, m_{8,6}, m_{8,7}, m_{8,8}, m_{8,9}, m_{8,10}, m_{8,11}, m_{8,12}, m_{8,13}, m_{8,14}, m_{8,15}, m_{8,16} \right]\left.\right]$$

$n_T :=$

$$\begin{bmatrix} 1 & 2 & 3 & 4 & 5 & \\ -\frac{(1-\eta)(1-\zeta)}{8} & 0 & -\frac{(1-\eta)(1+\zeta)}{8} & 0 & \frac{(1-\eta)(1+\zeta)}{8} & \cdots \\ m_{2,1} & m_{2,2} & m_{2,3} & m_{2,4} & m_{2,5} & \cdots \\ m_{3,1} & m_{3,2} & m_{3,3} & m_{3,4} & m_{3,5} & \cdots \\ m_{4,1} & m_{4,2} & m_{4,3} & m_{4,4} & m_{4,5} & \cdots \\ m_{5,1} & m_{5,2} & m_{5,3} & m_{5,4} & m_{5,5} & \cdots \\ m_{6,1} & m_{6,2} & m_{6,3} & m_{6,4} & m_{6,5} & \cdots \\ m_{7,1} & m_{7,2} & m_{7,3} & m_{7,4} & m_{7,5} & \cdots \\ m_{8,1} & m_{8,2} & m_{8,3} & m_{8,4} & m_{8,5} & \cdots \end{bmatrix}$$

8 × 16 Matrix