Exercises 7.2

5. (Opt.) Find all shape functions for the transition element shown below.

6. (Opt.) Using computer software plot the shape functions of nodes 1 and 5 for the element in the last exercise.

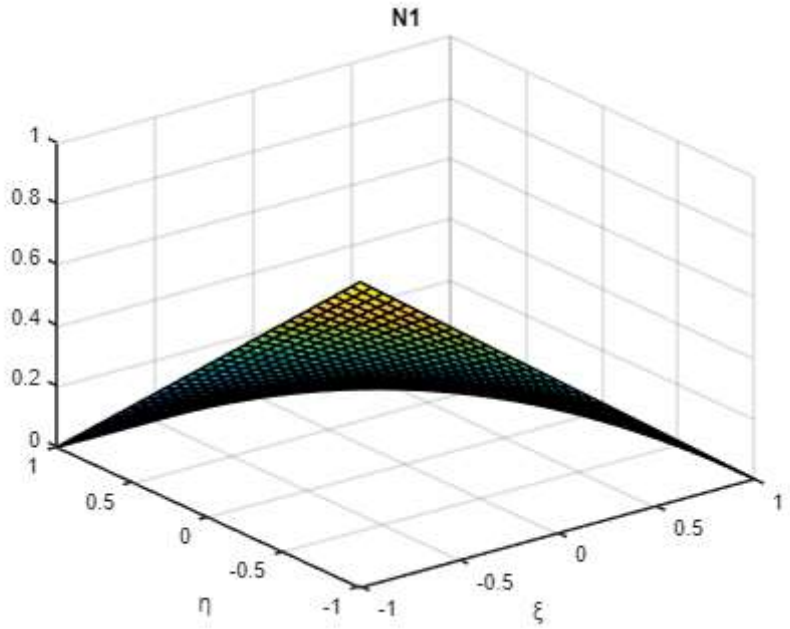
```
clear all
clc
```

```
syms xi eta a b x
```

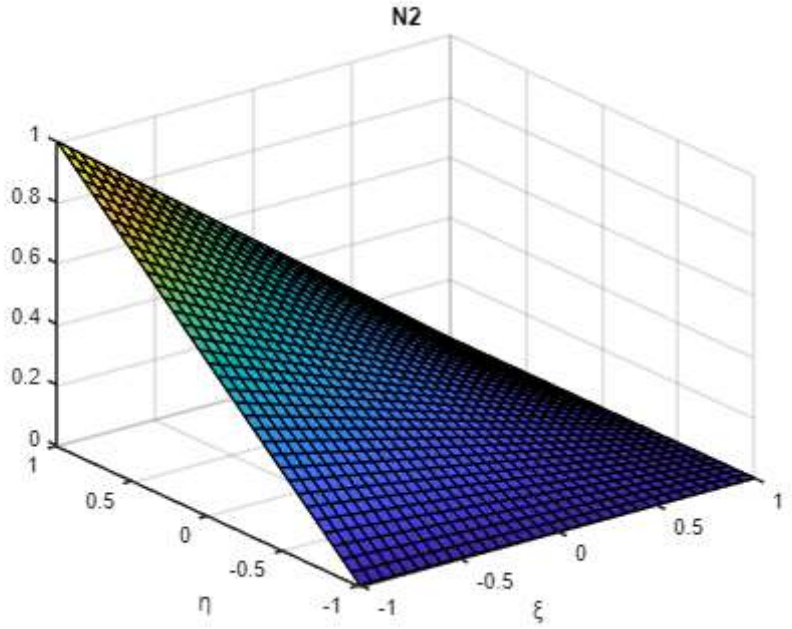
```
% ELEMENTO DE TRANSIÇÃO QUADRILATERAL COM 5 NÓS
NC =  1/4 * (1 + xi*a) * (1 + eta*b);    % i = 1...4 (linear)
NMP = 1/2 * (1 + xi*a) * (1 - eta^2);    % i = 6, 8  (quadratico)
NMI = 1/2 * (1 + xi^2) * (1 - eta*b);    % i = 5, 7  (quadratico)

N1 = subs (NC,  [a b], [-1 -1]);
N2 = subs (NC,  [a b], [ 1 -1]);
N3 = subs (NC,  [a b], [ 1  1]);
N4 = subs (NC,  [a b], [-1  1]);
N5 = subs (NMP, [a b], [ 1  0]);
```

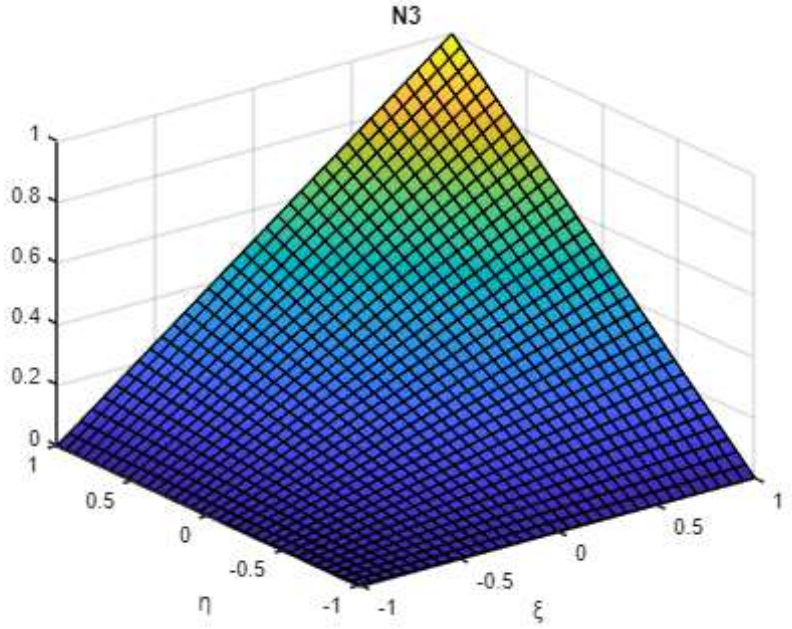
```
fsurf(N1,[-1 1 -1 1])
title 'N1'
xlabel ("ξ");
ylabel ("η");
```



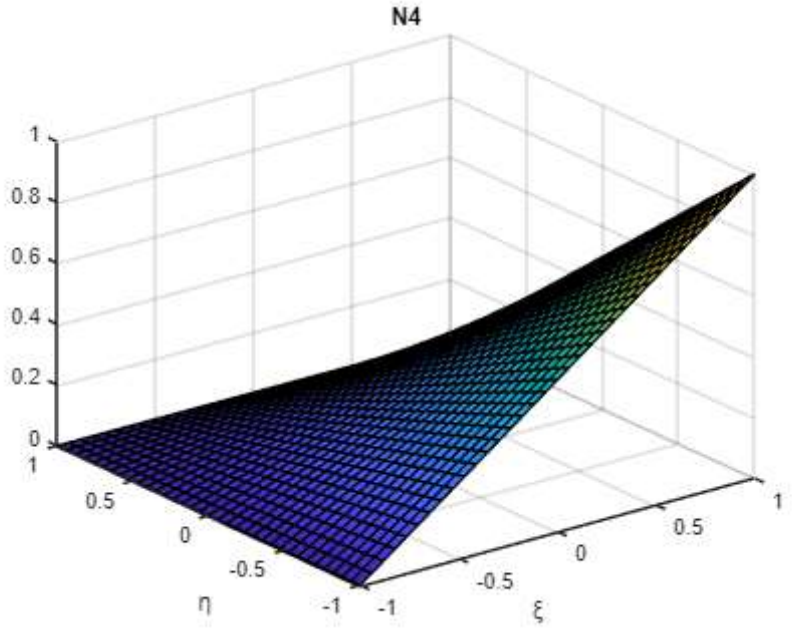

```
fsurf(N2,[-1 1 -1 1])
title 'N2'
xlabel ("ξ");
ylabel ("η");
```




```
fsurf(N3,[-1 1 -1 1])
title 'N3'
xlabel ("ξ");
ylabel ("η");
```




```
fsurf(N4,[-1 1 -1 1])
title 'N4'
xlabel ("ξ");
ylabel ("η");
```




```
fsurf(N5,[-1 1 -1 1])
title 'N5'
xlabel ("ξ");
ylabel ("η");
```