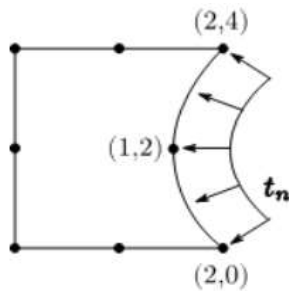


Exercises 5.6

4. For the element at right, determine the corresponding nodal forces if a normal traction $t_n = 1 \text{ kPa}$ is applied in the shaded face..



```
clear all
clc
```

```
type = 8;
C = [2 4; 2 0; 1 2];
tn = 1;
q = 3;
F = compute_F(type, C, tn, 3);
vpa (F, 3)
```

```
ans =
(-0.667
 0.667
-0.667
-0.667
-2.67
 0)
```

```
function F = compute_F(type,C, P, q)
if type == 4
    nnodes = 2;
elseif type == 8
    nnodes = 3;
elseif type == 12
    nnodes = 4;
else type = 0;
end
ndof = 2;
F = zeros(ndof*nnodes,1);
for i = 1: q
    Q = quadrature_lin(q);
    xi = Q (i, 1);
    w = Q (i, 2);
    [dN, n] = lin_shape_form(nnodes,xi);
    J = C'*dN;
    N = zeros(nnodes*ndof,ndof);
    for j = 1: nnodes
        k = (j-1) * ndof;
        I = eye(2);
        N([k+1 k+2], :) = I*n(j);
    end
    F = F + w * P * N;
end
```

```
end
tn = [J(2) -J(1)];
jn = tn/norm(tn);
F = F + N*P*jn'*norm(J)*w;
end
end
```