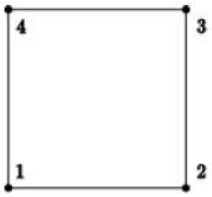
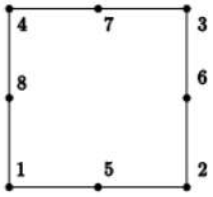
Exercises 5.6

1. For the elements below, determine the nodal forces equivalent to body forces. Consider the element area as A, the thikness as t and the unit weight as γ.






```
clear all
clc
```

```
syms xi eta gamma t A
```

```
[dN, N] = quad4_derivs(xi, eta);
int(N,xi,-1,1);
Fe = gamma*t*A/4*int(int(N,xi,-1,1),eta,-1,1)
```

Fe =

$$\begin{pmatrix} \frac{A\gamma t}{4} \\ \frac{A\gamma t}{4} \\ \frac{A\gamma t}{4} \\ \frac{A\gamma t}{4} \end{pmatrix}$$

```
[dN, N] = quad8_derivs(xi, eta);
int(N,xi,-1,1);
Fe = gamma*t*A/4*int(int(N,xi,-1,1),eta,-1,1)
```

Fe =

$$\begin{pmatrix} -\frac{A\gamma t}{12} \\ -\frac{A\gamma t}{12} \\ -\frac{A\gamma t}{12} \\ -\frac{A\gamma t}{12} \\ \frac{A\gamma t}{3} \\ \frac{A\gamma t}{3} \\ \frac{A\gamma t}{3} \\ \frac{A\gamma t}{3} \end{pmatrix}$$