

```
> A:=matrix(6,6,[3,5,-1,0,0,-7,0,-2,0,0,0,10,0,0,3,0,0,1,0,7,32,3,15,-7
> 7,0,1,-10,0,-2,16,0,0,0,0,0,3]);
```

$$A := \begin{bmatrix} 3 & 5 & -1 & 0 & 0 & -7 \\ 0 & -2 & 0 & 0 & 0 & 10 \\ 0 & 0 & 3 & 0 & 0 & 1 \\ 0 & 7 & 32 & 3 & 15 & -77 \\ 0 & 1 & -10 & 0 & -2 & 16 \\ 0 & 0 & 0 & 0 & 0 & 3 \end{bmatrix}$$

```
> p:=charpoly(A,lambda);
```

$$p := \lambda^6 - 8\lambda^5 + 10\lambda^4 + 60\lambda^3 - 135\lambda^2 - 108\lambda + 324$$

```
> factor(p);
```

$$(\lambda + 2)^2 (\lambda - 3)^4$$

```
> E6:=diag(1,1,1,1,1,1);
```

$$E6 := \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

```
> C1:=evalm( A + 2 * E6);
```

$$C1 := \begin{bmatrix} 5 & 5 & -1 & 0 & 0 & -7 \\ 0 & 0 & 0 & 0 & 0 & 10 \\ 0 & 0 & 5 & 0 & 0 & 1 \\ 0 & 7 & 32 & 5 & 15 & -77 \\ 0 & 1 & -10 & 0 & 0 & 16 \\ 0 & 0 & 0 & 0 & 0 & 5 \end{bmatrix}$$

```
> C12:=evalm( C1^2 );
```

$$C12 := \begin{bmatrix} 25 & 25 & -10 & 0 & 0 & -21 \\ 0 & 0 & 0 & 0 & 0 & 50 \\ 0 & 0 & 25 & 0 & 0 & 10 \\ 0 & 50 & 170 & 25 & 75 & -428 \\ 0 & 0 & -50 & 0 & 0 & 80 \\ 0 & 0 & 0 & 0 & 0 & 25 \end{bmatrix}$$

```
> gaussjord( C12);
```

$$\begin{bmatrix} 1 & 0 & 0 & \frac{-1}{2} & \frac{-3}{2} & 0 \\ 0 & 1 & 0 & \frac{1}{2} & \frac{3}{2} & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

> C2:=evalm(A - 3 * E6);

$$C2 := \begin{bmatrix} 0 & 5 & -1 & 0 & 0 & -7 \\ 0 & -5 & 0 & 0 & 0 & 10 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 7 & 32 & 0 & 15 & -77 \\ 0 & 1 & -10 & 0 & -5 & 16 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

> C24:=evalm(C2^4);

$$C24 := \begin{bmatrix} 0 & -625 & 0 & 0 & 0 & 1250 \\ 0 & 625 & 0 & 0 & 0 & -1250 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 250 & -3750 & 0 & -1875 & 7000 \\ 0 & -500 & 1250 & 0 & 625 & -1500 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

> gaussjord(C24);

$$\begin{bmatrix} 0 & 1 & 0 & 0 & 0 & -2 \\ 0 & 0 & 1 & 0 & \frac{1}{2} & -2 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$