```
with( LinearAlgebra ) :
A1 := << 1, 0 >|< 1, 2 >>
```

$$\begin{bmatrix} 1 & 1 \\ 0 & 2 \end{bmatrix} \tag{1}$$

```
A2 := << 1, 1 >|< 2, 0 >>
```

$$\begin{bmatrix} 1 & 2 \\ 1 & 0 \end{bmatrix} \tag{2}$$

```
A := DiagonalMatrix( [ A1, A2 ] )
```

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

```
e := Eigenvectors( A, output = list )
```

$$\left[\left[1, 1, \left\{ \begin{bmatrix} 1 \\ 0 \\ 0 \\ 0 \end{bmatrix} \right\} \right], \left[-1, 1, \left\{ \begin{bmatrix} 0 \\ 0 \\ -1 \\ 1 \end{bmatrix} \right\} \right], \left[2, 2, \left\{ \begin{bmatrix} 1 \\ 1 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ 2 \\ 1 \end{bmatrix} \right\} \right] \right] \tag{4}$$

```
e||(1..4) := e[1, 3, 1], e[2, 3, 1], e[3, 3, 1], e[3, 3, 2]
```

$$\begin{bmatrix} 1 \\ 0 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ -1 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ 1 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ 2 \\ 1 \end{bmatrix} \tag{5}$$

```
P := Matrix( [e||(1..4)] )
```

$$\begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & -1 & 0 & 2 \\ 0 & 1 & 0 & 1 \end{bmatrix} \tag{6}$$

```
Ap := P^(-1).A.P
```

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 2 & 0 \\ 0 & 0 & 0 & 2 \end{bmatrix} \tag{7}$$