

```

solve(x^2 - 3*x + 2 = 0)
{[x = 1], [x = 2]}

A := matrix([[7,3],[3,-1]])

$$\begin{pmatrix} 7 & 3 \\ 3 & -1 \end{pmatrix}$$


A^-1

$$\begin{pmatrix} \frac{1}{16} & \frac{3}{16} \\ \frac{3}{16} & -\frac{7}{16} \end{pmatrix}$$


det(A)
-16

identity := matrix([[1,0],[0,1]])

$$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$


charpoly := det(A - `&lambda;`*identity)

$$\lambda^2 - 6\lambda - 16$$


solve(charpoly)
{[λ = -2], [λ = 8]}

linalg::eigenvalues(A)
{-2, 8}

linalg::eigenvectors(A)

$$\left[ \left[ -2, 1, \left[ \begin{pmatrix} -\frac{1}{3} \\ 1 \end{pmatrix} \right] \right], \left[ 8, 1, \left[ \begin{pmatrix} 3 \\ 1 \end{pmatrix} \right] \right] \right]$$


clear
clear

clc
clc

P:= matrix([[0.97,0.05,0.10],[0.00,0.90,0.05],[0.03,0.05,0.85]])

$$\begin{pmatrix} 0.97 & 0.05 & 0.1 \\ 0 & 0.9 & 0.05 \\ 0.03 & 0.05 & 0.85 \end{pmatrix}$$


linalg::eigenvectors(P)

```

$$\left[ \left[ 1.0, 1, \left[ \begin{pmatrix} 0.9658342616 \\ 0.1159001114 \\ 0.2318002228 \end{pmatrix} \right] \right], \left[ 0.9109901951, 1, \left[ \begin{pmatrix} 0.7659408734 \\ -0.6279213172 \\ -0.1380195561 \end{pmatrix} \right] \right], \right. \\ \left. \left[ 0.8090098049, 1, \left[ \begin{pmatrix} -0.3672241357 \\ -0.4479414339 \\ 0.8151655696 \end{pmatrix} \right] \right] \right]$$

```
charpoly:= det(P - `&lambda;`*matrix([[1,0,0],[0,1,0],[0,0,1]]))
-1.0 λ3 + 2.72 λ2 - 2.457 λ + 0.737
```

```
solve(charpoly=0)
{[λ = 1.0], [λ = 0.8090098049], [λ = 0.9109901951]}
```

```
B := matrix([[7,-2],[2,3]])

$$\begin{pmatrix} 7 & -2 \\ 2 & 3 \end{pmatrix}$$

```

```
cp := linalg::charpoly(B,x)
x2 - 10 x + 25
```

```
identity := matrix([[1,0],[0,1]])

$$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

```

```
det(B - `&lambda;`*identity)
(λ - B)2
```

```
factor(cp)
(x - 5)2
```

```
linalg::eigenvectors(B)
[[5, 2, [[ $\begin{pmatrix} 1 \\ 1 \end{pmatrix}$ ]]]
```

```
B*matrix([1,1])

$$\begin{pmatrix} 5 \\ 5 \end{pmatrix}$$

```