```
> restart;
> with(LinearAlgebra) :
>
> A := Matrix([[0.7, 0.4, 0.2], [0.1, 0.2, 0.3], [0.2, 0.4, 0.5]])
```

$$A := \begin{bmatrix} 0.7 & 0.4 & 0.2 \\ 0.1 & 0.2 & 0.3 \\ 0.2 & 0.4 & 0.5 \end{bmatrix} \tag{1}$$

```
> A := convert(A, rational)
```

$$A := \begin{bmatrix} \frac{7}{10} & \frac{2}{5} & \frac{1}{5} \\ \frac{1}{10} & \frac{1}{5} & \frac{3}{10} \\ \frac{1}{5} & \frac{2}{5} & \frac{1}{2} \end{bmatrix} \tag{2}$$

```
> J, Q := JordanForm(A, output = ['J', 'Q'])
```

$$J, Q := \begin{bmatrix} 1 & 0 & 0 \\ 0 & \frac{1}{5} - \frac{\sqrt{5}}{10} & 0 \\ 0 & 0 & \frac{1}{5} + \frac{\sqrt{5}}{10} \end{bmatrix}, \tag{3}$$

$$\left[\left[\frac{28\sqrt{5}}{(-5+8\sqrt{5})(8+\sqrt{5})}, \frac{-71+31\sqrt{5}}{2(-5+8\sqrt{5})(8+\sqrt{5})}, \frac{7+3\sqrt{5}}{2(-5+8\sqrt{5})}\right], \left[\frac{11\sqrt{5}}{(-5+8\sqrt{5})(8+\sqrt{5})}, -\frac{-29+11\sqrt{5}}{2(-5+8\sqrt{5})(8+\sqrt{5})}, -\frac{3+\sqrt{5}}{2(-5+8\sqrt{5})}\right], \left[\frac{20\sqrt{5}}{(-5+8\sqrt{5})(8+\sqrt{5})}, -\frac{-21+10\sqrt{5}}{(-5+8\sqrt{5})(8+\sqrt{5})}, -\frac{2+\sqrt{5}}{-5+8\sqrt{5}}\right]\right]$$

```
>
> evalf(Q)
```

(4)

$$\begin{bmatrix} 0.4745762708 & -0.006374282085 & 0.5317980110 \\ 0.1864406778 & 0.01668808704 & -0.2031287650 \\ 0.3389830506 & -0.01031380495 & -0.3286692458 \end{bmatrix} \quad (4)$$

>