> $with(LinearAlgebra):$

> $A := Matrix([[2, 1, 2], [4, 2, 4], [2, 1, 2]])$

$$A := \begin{bmatrix} 2 & 1 & 2 \\ 4 & 2 & 4 \\ 2 & 1 & 2 \end{bmatrix}$$

(1)

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

$$J, Q := \begin{bmatrix} 0 & 0 & 0 \\ 0 & 6 & 0 \\ 0 & 0 & 0 \end{bmatrix}, \begin{bmatrix} -\dfrac{1}{3} & \dfrac{1}{3} & -1 \\ -\dfrac{2}{3} & \dfrac{2}{3} & 0 \\ \dfrac{2}{3} & \dfrac{1}{3} & 1 \end{bmatrix}$$

(2)

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