

$$\begin{aligned}
 & \text{[> restart: with(LinearAlgebra) :} \\
 & \text{[> A := Matrix([[3, 4], [1, 0]])} \\
 & \qquad A := \begin{bmatrix} 3 & 4 \\ 1 & 0 \end{bmatrix} \qquad (1)
 \end{aligned}$$

$$\begin{aligned}
 & \text{[> J, Q := JordanForm(A, output = ['J','Q'])} \\
 & \qquad J, Q := \begin{bmatrix} -1 & 0 \\ 0 & 4 \end{bmatrix}, \begin{bmatrix} \frac{1}{5} & \frac{4}{5} \\ -\frac{1}{5} & \frac{1}{5} \end{bmatrix} \qquad (2)
 \end{aligned}$$

$$\begin{aligned}
 & \text{[> recursie_relatie := Q \cdot MatrixPower(J, n) \cdot Q^{-1} \cdot Vector([1, 1])} \\
 & \qquad \text{recursie_relatie} := \begin{bmatrix} -\frac{3(-1)^n}{5} + \frac{8 \cdot 4^n}{5} \\ \frac{3(-1)^n}{5} + \frac{2 \cdot 4^n}{5} \end{bmatrix} \qquad (3)
 \end{aligned}$$

$$\begin{aligned}
 & \text{[> limit_eq := } \frac{\text{recursie_relatie}[1]}{\text{recursie_relatie}[2]} \\
 & \qquad \text{limit_eq} := \frac{-\frac{3(-1)^n}{5} + \frac{8 \cdot 4^n}{5}}{\frac{3(-1)^n}{5} + \frac{2 \cdot 4^n}{5}} \qquad (4)
 \end{aligned}$$

$$\begin{aligned}
 & \text{[> limit(limit_eq, n = infinity)} \\
 & \qquad 4 \qquad (5)
 \end{aligned}$$

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