

> Q5 Ch9 - 3;

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(1)

> with(LinearAlgebra) :

>

> A := Matrix([[4, 2, -1], [2, 0, 2], [-1, 2, 0]]);

x_0 := <-1, 0, 1>;

Tol := 0.0001;

k := 15;

y_k := evalf(A·x_{k-1});

mu_k := evalf(Transpose(x_k - 1)·y_k);

x_k = $\left(\frac{y_k}{\text{Norm}(y_k, 2)} \right)$;

$$A := \begin{bmatrix} 4 & 2 & -1 \\ 2 & 0 & 2 \\ -1 & 2 & 0 \end{bmatrix}$$

$$x_0 := \begin{bmatrix} -1 \\ 0 \\ 1 \end{bmatrix}$$

Tol := 0.0001

k := 15

$$y_k := \begin{bmatrix} 4 \cdot x_{14} & 2 \cdot x_{14} & -1 \cdot x_{14} \\ 2 \cdot x_{14} & 0 & 2 \cdot x_{14} \\ -1 \cdot x_{14} & 2 \cdot x_{14} & 0 \end{bmatrix}$$

mu_k :=

$$\begin{bmatrix} 4 \cdot \text{Transpose}(x_k - 1) x_{14} & 2 \cdot \text{Transpose}(x_k - 1) x_{14} & -1 \cdot \text{Transpose}(x_k - 1) x_{14} \\ 2 \cdot \text{Transpose}(x_k - 1) x_{14} & 0 & 2 \cdot \text{Transpose}(x_k - 1) x_{14} \\ -1 \cdot \text{Transpose}(x_k - 1) x_{14} & 2 \cdot \text{Transpose}(x_k - 1) x_{14} & 0 \end{bmatrix}$$

(2)

$$x_k = \frac{\begin{bmatrix} 4 \cdot x_{14} & 2 \cdot x_{14} & -1 \cdot x_{14} \\ 2 \cdot x_{14} & 0 & 2 \cdot x_{14} \\ -1 \cdot x_{14} & 2 \cdot x_{14} & 0 \end{bmatrix}}{\text{Norm} \left(\begin{bmatrix} 4 \cdot x_{14} & 2 \cdot x_{14} & -1 \cdot x_{14} \\ 2 \cdot x_{14} & 0 & 2 \cdot x_{14} \\ -1 \cdot x_{14} & 2 \cdot x_{14} & 0 \end{bmatrix}, 2 \right)}$$

(2)

