

Próba feladatok a 5. gyakorlathoz

1.

$$A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 5 & 0 \\ 1 & 7 & 5 \end{bmatrix}$$

Megoldás:

$$Q = \begin{bmatrix} \frac{1}{\sqrt{3}} & 0 & -\frac{2}{\sqrt{6}} \\ \frac{1}{\sqrt{3}} & -\frac{1}{\sqrt{2}} & \frac{1}{\sqrt{6}} \\ \frac{1}{\sqrt{3}} & \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{6}} \end{bmatrix} = \begin{bmatrix} 0.5774 & 0 & -0.8165 \\ 0.5774 & -0.7071 & 0.4082 \\ 0.5774 & 0.7071 & 0.4082 \end{bmatrix}$$

$$R = \begin{bmatrix} \sqrt{3} & 6\sqrt{3} & 2\sqrt{3} \\ 0 & \sqrt{2} & \frac{5}{2}\sqrt{2} \\ 0 & 0 & \frac{1}{2}\sqrt{6} \end{bmatrix} = \begin{bmatrix} 1.7321 & 10.3923 & 3.4641 \\ 0 & 1.4142 & 3.5355 \\ 0 & 0 & 1.2247 \end{bmatrix}$$

2.

$$A = \begin{bmatrix} -2 & -1 & 1 & 6 \\ -2 & 5 & 4 & 0 \\ -2 & -1 & -5 & -8 \\ -2 & 5 & 4 & -2 \end{bmatrix}$$

Megoldás:

$$Q = \begin{bmatrix} -\frac{1}{2} & \frac{1}{2} & \frac{1}{\sqrt{2}} & 0 \\ -\frac{1}{2} & -\frac{1}{2} & 0 & -\frac{1}{\sqrt{2}} \\ -\frac{1}{2} & \frac{1}{2} & -\frac{1}{\sqrt{2}} & 0 \\ -\frac{1}{2} & -\frac{1}{2} & 0 & \frac{1}{\sqrt{2}} \end{bmatrix} = \begin{bmatrix} -0.5 & 0.5 & 0.7071 & 0 \\ -0.5 & -0.5 & 0 & 0.7071 \\ -0.5 & 0.5 & -0.7071 & 0 \\ -0.5 & -0.5 & 0 & -0.7071 \end{bmatrix}$$

$$R = \begin{bmatrix} 4 & -4 & -2 & 8 \\ 0 & -6 & -6 & -6 \\ 0 & 0 & 3\sqrt{2} & \sqrt{2} \\ 0 & 0 & 0 & -\sqrt{2} \end{bmatrix} = \begin{bmatrix} 4 & -4 & -2 & 8 \\ 0 & -6 & -6 & -6 \\ 0 & 0 & 4.2426 & 1.4142 \\ 0 & 0 & 0 & -1.4142 \end{bmatrix}$$

3.

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 5 \\ 2 & 1 & -9 \end{bmatrix}$$

Megoldás:

$$Q = \begin{bmatrix} -0.4472 & -0.7171 & -0.5345 \\ 0 & -0.5976 & 0.8018 \\ -0.8944 & 0.3586 & 0.2673 \end{bmatrix}$$

$$R = \begin{bmatrix} -2.2361 & -1.7889 & 6.7082 \\ 0 & -1.6733 & -8.3666 \\ 0 & 0 & 0 \end{bmatrix}$$

4. $P = [6, 2, 3, 0]^T$ és $P' = [4, 2, 5, 2]^T$

Megoldás:

$$H = \begin{bmatrix} 0.3333 & 0 & 0.6667 & 0.6667 \\ 0 & 1.0000 & 0 & 0 \\ 0.6667 & 0 & 0.3333 & -0.6667 \\ 0.6667 & 0 & -0.6667 & 0.3333 \end{bmatrix}$$

5. $P = [1, 2, 3]^T$ és $P' = [1, 1, 1]^T$

Nincs ilyen Householder-transzformáció.