

Najděte matici $A \in \mathbb{R}^{3 \times 3}$, o které platí následující:

$$\text{Ker}(A) = \text{Span} \{ (1, -1, -1)^T, (1, 1, -3)^T \}$$

$$\text{Ker}(A^T) = \text{Span} \{ (1, 2, 4)^T, (0, 1, 1)^T \}$$

$$\dim(\text{Ker}(A)) = 2$$

$$\text{tedy } \text{rang}(A) = 1$$

$$\begin{aligned} x - y - z &= 0 \\ x + y - 3z &= 0 \end{aligned} \quad \begin{aligned} x &= x \quad \rightarrow \text{colodiv} \\ y &= z \quad \rightarrow \text{tyto m\u00e1zou b\u00fdt colodiv, ale mus\u00ed se rovnat} \end{aligned}$$

$$2y - 2z = 0$$

$$2y = 2z$$

$$x = y + z = 2y = 2z$$

$$\begin{aligned} x &= 2 \\ y &= 1 \\ z &= 1 \end{aligned}$$

$$A \begin{pmatrix} 2 & 1 & 1 \\ \vdots & \vdots & \vdots \\ \vdots & \vdots & \vdots \end{pmatrix}$$

$$x + 2y + 4z = 0$$

$$y + z = 0$$

$$y = -z$$

$$x = -2z$$

$$y = -z$$

$$z = z$$

$$A \begin{pmatrix} 2 & \cdot & \cdot \\ 1 & \cdot & \cdot \\ -1 & \cdot & \cdot \end{pmatrix}$$

$$x - 2z + 4z = 0$$

$$x = -2z$$

$$A \begin{pmatrix} 2 & 1 & 1 \\ 1 & \frac{1}{2} & \frac{1}{2} \\ -1 & -\frac{1}{2} & -\frac{1}{2} \end{pmatrix}$$