

ŘEŠENÍ Bonus 2

①

$$a) \left(\begin{array}{ccc|c} \textcircled{1} & -2 & 1 & 0 \\ 2 & 1 & -1 & 3 \\ 1 & 1 & -2 & 3 \end{array} \right) \begin{array}{l} | \cdot (-2) \quad | \cdot (-1) \\ \leftarrow + \\ \leftarrow + \end{array} \sim \left(\begin{array}{ccc|c} 1 & -2 & 1 & 0 \\ 0 & 5 & -3 & 3 \\ 0 & 3 & -3 & 3 \end{array} \right) \begin{array}{l} \\ \\ | : 3 \end{array} \curvearrowright$$

$$\sim \left(\begin{array}{ccc|c} 1 & -2 & 1 & 0 \\ 0 & \textcircled{1} & -1 & 1 \\ 0 & 5 & -3 & 3 \end{array} \right) \begin{array}{l} | \cdot (-5) \\ \leftarrow \end{array} \sim \left(\begin{array}{ccc|c} 1 & -2 & 1 & 0 \\ 0 & 1 & -1 & 1 \\ 0 & 0 & 2 & -2 \end{array} \right)$$

$$2x_3 = -2$$

$$x_2 - x_3 = 1$$

$$x_1 - 2x_2 + x_3 = 0$$

$$\underline{\underline{x_3 = -1}}$$

$$x_2 + 1 = 1 \Rightarrow \underline{\underline{x_2 = 0}}$$

$$x_1 - 1 = 0 \Rightarrow \underline{\underline{x_1 = 1}}$$

$$b) \begin{pmatrix} 1 & -2 & 1 \\ 2 & 1 & -1 \\ 1 & 1 & -2 \end{pmatrix} \cdot \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} 0 \\ 3 \\ 3 \end{pmatrix}$$

$$\textcircled{2} \quad \begin{vmatrix} 2-\lambda & 3 \\ 2 & 1-\lambda \end{vmatrix} = (2-\lambda)(1-\lambda) - 6 = \lambda^2 - 3\lambda - 4 = (\lambda+1)(\lambda-4) = 0$$

$$\underline{\underline{\lambda_1 = -1, \lambda_2 = 4}}$$

$$\textcircled{3} \quad a) e^x = 14 \Rightarrow x = \ln 14$$

$$b) \ln x = 3 \Rightarrow x = e^3$$