Domácí úkol I

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1. **Řešení**:

$$\left(\begin{array}{ccc|c} -i & a & 1+i & 0 \\ 1 & 3i & b & 0 \\ i & -3 & 1 & 1 \end{array}\right)\left(\begin{array}{ccc|c} -i & a & 1+i & 0 \\ 0 & 3i-ai & b-i+1 & 0 \\ 0 & a-3 & 2+i & 1 \end{array}\right) \sim \left(\begin{array}{ccc|c} -i & a & 1+i & 0 \\ 0 & 3-a & -bi-1-i & 0 \\ 0 & 0 & 1-bi & 1 \end{array}\right)$$

$$\sim \left(\begin{array}{ccc|c} -i & a & 1+i & 0 \\ 0 & 3-a & -bi-1-i & 0 \\ 0 & 0 & 1 & \frac{1}{1-bi} \end{array}\right) \sim \left(\begin{array}{ccc|c} -i & a & 1+i & 0 \\ 0 & 3-a & 0 & \frac{bi+1+i}{1-bi} \\ 0 & 0 & 1 & \frac{1}{1-bi} \end{array}\right)$$

$$\sim \left(\begin{array}{ccc|c} -i & a & 0 & \frac{-1-i}{1-bi} \\ 0 & 1 & 0 & \frac{bi+1+i}{(1-bi)(3-a)} \\ 0 & 0 & 1 & \frac{1}{1-bi} \end{array}\right) \sim \left(\begin{array}{ccc|c} -i & 0 & 0 & -a\frac{(bi+1+i)}{(1-bi)(3-a)}+\frac{-1-i}{1-bi} \\ 0 & 1 & 0 & \frac{bi+1+i}{(1-bi)(3-a)} \\ 0 & 0 & 1 & \frac{1}{1-bi} \end{array}\right)$$

$$\sim \left(\begin{array}{ccc|c} 1 & 0 & 0 & \frac{-ai(bi+1+i)}{(1-bi)(3-a)}+\frac{-i+1}{1-bi} \\ 0 & 1 & 0 & \frac{bi+1+i}{(1-bi)(3-a)} \\ 0 & 0 & 1 & \frac{1}{1-bi} \end{array}\right) \sim \left(\begin{array}{ccc|c} 1 & 0 & 0 & \frac{-ai(bi+1+i)+(-i+1)(3-a)}{(1-bi)(3-a)} \\ 0 & 1 & 0 & \frac{bi+1+i}{(1-bi)(3-a)} \\ 0 & 0 & 1 & \frac{1}{1-bi} \end{array}\right)$$

$$\sim \left(\begin{array}{ccc|c} 1 & 0 & 0 & \frac{ab-ai+a-3i+ai+3-a}{(1-bi)(3-a)} \\ 0 & 1 & 0 & \frac{bi+1+i}{(1-bi)(3-a)} \\ 0 & 0 & 1 & \frac{1}{1-bi} \end{array}\right) \sim \left(\begin{array}{ccc|c} 1 & 0 & 0 & \frac{ab-3i+3}{(1-bi)(3-a)} \\ 0 & 1 & 0 & \frac{bi+1+i}{(1-bi)(3-a)} \\ 0 & 0 & 1 & \frac{1}{1-bi} \end{array}\right)$$

$$\underline{\underline{\left\{ \left(\begin{array}{c} \frac{ab-3i+3}{(1-bi)(3-a)} \\ \frac{bi+1+i}{(1-bi)(3-a)} \\ \frac{1}{1-bi} \end{array} \right) \;\middle|\; a \in \mathbb{C} \setminus \{3\}, b \in \mathbb{C} \setminus \{-i\} \right\}}}$$