*1. Find the solutions of the initial value problems

$$x' = \begin{pmatrix} 3 & -2 \\ 4 & -1 \end{pmatrix} x, \quad x(0) = \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \quad x' = \begin{pmatrix} 2 & -\frac{5}{2} \\ \frac{9}{5} & -1 \end{pmatrix} x, \quad x(0) = \begin{pmatrix} 1 \\ -1 \end{pmatrix}.$$

2. Find the general solution of the system of equations

$$x' = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & -2 \\ 3 & 2 & 1 \end{pmatrix} x.$$

3. Find the general solutions of the following nonhomogeneous systems

(*)
$$x' = \begin{pmatrix} 1 & \sqrt{3} \\ \sqrt{3} & -1 \end{pmatrix} x + \begin{pmatrix} e^t \\ \sqrt{3}e^{-t} \end{pmatrix},$$

$$x' = \begin{pmatrix} 1 & -1 & 4 \\ 3 & 2 & -1 \\ 2 & 1 & -1 \end{pmatrix} x + \begin{pmatrix} e^t \\ 1 \\ 1 \end{pmatrix}.$$