Part I Problems

In the following two problems, find a fundamental matrix of the given system and then use it to find the specific solution of the system which satisfies the given initial condition.

Problem 1:  \[ x' = \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix} x, \quad x(0) = \begin{bmatrix} 3 \\ -2 \end{bmatrix} \]

Problem 2:  \[ x' = \begin{bmatrix} 2 & -5 \\ 4 & -2 \end{bmatrix}, \quad x(0) = \begin{bmatrix} 0 \\ 1 \end{bmatrix} \]