Full Name:

ID: Serial number:

Problem 1 Solve the nonhomogeneous system of DEs:

$$\frac{dx}{dt} = 2x - y + e^t \cos(2t),$$

$$\frac{dy}{dt} = x + 2y + e^t \sin(2t).$$

Problem 2 Solve the IVP:

$$X' = \begin{pmatrix} 3 & 0 & 0 & 0 \\ 0 & 3 & 8 & -2 \\ 0 & 0 & -1 & 1 \\ 9 & 0 & -1 & 1 \end{pmatrix} X \quad \text{with} \quad X(0) = \begin{pmatrix} 1 \\ -2 \\ 2 \\ 0 \end{pmatrix}$$