8.2 Exercises

Problem 1 Find a particular soln of $\vec{x}' = \begin{bmatrix} 4 & 2 \\ 6 & 5 \end{bmatrix}\vec{x} + \begin{bmatrix} e^t + t \\ 2e^t + 2 \end{bmatrix}$.

(assume the pre-trial you find is linearly independent from the homogenous sols)

Problem 2 Solve this DEQ using variation of parameters: $\vec{x}' = \begin{bmatrix} 1 & 1 \\ 0 & 2 \end{bmatrix}\vec{x} + \begin{bmatrix} te^{2t} \\ 0 \end{bmatrix}$, where the soln of the associated homogeneous system gives the fundamental matrix: $\mathbf{X}(t) = \begin{bmatrix} e^{t} & e^{2t} \\ 0 & e^{2t} \end{bmatrix}$.