1. Use the method of variation of parameters to find the solution to the following initial value problem.

\[ y'' - 2y' + y = 2xe^x, \quad y(0) = -1, \quad y'(0) = 0. \]

2. Find the first four terms in the series expansion about \( x = 0 \) of the solution to the following initial value problem.

\[ y' + 2xy = e^x, \quad y(0) = 1. \]