1. Find the general solution of the differential equation \( y' = y + e^t \), by the integrating factor method.
2. Carry out the first few steps (i.e., until you have to integrate) of the integrating factor method with the following ODEs:

- \( y' + 4y = t^2 \)

- \( y' + (\sin t)y = 1 \)

- \( y' - 12t^5 y = t^3 \)

- \( y' + \frac{1}{t}y = 1 \).