Show steps, explain what you do.

1. First, verify that \( y = C_1 + C_2 \cos x + C_3 \sin x \) is a family of solutions to \( y''' + y' = 0 \). Then, calculate the three constants for the initial conditions: \( y(\pi) = 0, \quad y'(\pi) = 2, \quad y''(\pi) = -1 \)

2. Use the integrating factor technique to solve the IVP: \( x \frac{dy}{dx} - y = 2x^2, \quad y(5) = 1 \) with \( x > 0 \)