Q1. Determine a region of the xy-plane for which first order differential equation \( \frac{dy}{dx} = \frac{3y^{2/3}}{2} \) has a unique solution; whose graph passes through a point \( (x_o, y_o) \) of the region.

Q2. Determine if \( 2(y^3-1)\ dx + x \ dy = 0 \) is linear or non-linear differential equation if 'x' is taken as a DEPENDENT variable and 'y' an INDEPENDENT variable.

Q3. Solve the IVP \( \frac{1}{2} \ dy / dx + \frac{1}{2} y = f(x) \) with \( f(x) = \begin{cases} 1 & 0 \leq x \leq 1 \\ 0 & x > 1 \end{cases} \) and \( y(0) = 0 \).