Q1) Determine and sketch the region in the plane such that for any point \((x_0, y_0)\) the differential equation \(y' = \sqrt{x^2 - 1}/\sqrt{y^2 - 1}\) has a unique solution passing through \((x_0, y_0)\).

Q2) Verify that the family of functions \(y = ce^x/(1 - ce^x)\) is one parameter family of solutions of the DE \(dy/dx = y^2 + y\). Find a singular solution.
Q3) Solve the differential equation \[ \frac{dy}{dx} = \frac{xe^x}{\sin y} \].