

A model for Quiz 1

Q1. Determine the largest local region of the xy -plane for which the following initial value problem admits a unique solution

$$\begin{cases} \frac{dy}{dx} - \sqrt{x+1} = \frac{\ln \sqrt{y-2}}{x-1} \\ y\left(\frac{1}{2}\right) = 3. \end{cases}$$

Q2. Solve the differential equation

$$2 \frac{\sin y}{\cos y} dy + x(1 - \cos 2y) dx = 0, \quad y \neq \frac{\pi}{2}$$

Q3. Find the general solution of the DE

$$(x^2 + y^2)y' - xy = 0.$$