

Q1. Solve the first order initial value problem $(x^2 + 4)\frac{dy}{dx} + 2xy = \frac{(x^2 + 4)\cos x}{\tan^{-1}(x/2)}$ satisfying $y(0) = 2$.

Q2. Is the ODE $(y^3 - x)\frac{dy}{dx} = y^2$ linear in dependent variable y ? If not write it in linear form. Do not solve the resulting equation.