1. For the differential equation \( y''' + (y')^4 + \sin y = \tan x \):

   (a) Find order and independent variable

   (b) Is this DE linear or nonlinear

2. Solve the initial-value problem:

   \[ \sqrt{1 - y^2} dx - \sqrt{1 - x^2} dy = 0, \quad y(0) = 1 \]
1. Show that $y = xe^x$ is an explicit solution of the differential equation $y'' - 2y' + y = 0$.

2. Solve $(x + 2y^3) \frac{dy}{dx} = y$. 
1. Is the differential equation \( \frac{d^2y}{dt^2} + (y')^5 \sin t = 3e^t \) linear or nonlinear? What is its order?

2. Solve the initial-value problem:

\[
\frac{dy}{dx} = \frac{-x}{y}, \quad y(3) = -4
\]

3. Find general solution of the differential equation \( \frac{dy}{dx} + \frac{y}{x} = \sin x \)