

Problem 2

In each of Problems 1 through 6, determine the order of the given differential equation; also state whether the equation is linear or nonlinear.

$$(1 + y^2) \frac{d^2 y}{dt^2} + t \frac{dy}{dt} + y = e^t$$

Solution

The second derivative of y is the highest derivative, so the order of the ODE is 2. The ODE is nonlinear because there is a nonlinear function of y , namely

$$(1 + y^2) \frac{d^2 y}{dt^2}.$$