

Name:

SOLUTION

Quiz #2 - January 21, 2004

1. Use the method of integrating factors to solve the initial value problem:

$$y' - y = e^{2t}, \quad y(0) = 3$$

$$e^{-t} y' - e^{-t} y = e^t$$

$$(e^{-t} y)' = e^t$$

$$e^{-t} y = \int e^t dt$$

$$e^{-t} y = e^t + C$$

$$y = e^{2t} + C e^t$$

$$3 = 1 + C e^0$$

$$C = 2$$

$$y = ~~t + 2~~ e^{-t}$$

$$y = e^{2t} + 2e^t$$

2. Write (and label) a 2nd order nonlinear differential equation and a first order linear differential equation.

$$y''^2 = t$$

$$y' + y = t$$