

Instructor: Leopoldo P. Franca

NAME: _____

TEST # 1:

Please show all your work in the test. Guessed answers are NOT acceptable. Open book. You may use calculators. Good luck!

(25 pt) 1) Solve $(2ye^{2x} + 2xe^y + x) + (y^2 + e^{2x} + x^2e^y)\frac{dy}{dx} = 0$.

(25 pt) 2) Solve $\frac{dy}{dx} = \frac{\cos(x)}{1+y^2}$, $y(0) = 1$.

(25 pt) 3) Solve $\frac{dy}{dx} = e^{3x} - y + 5$, $y(0) = 2$.

(25 pt) 4) A mixing tank initially contains 100 gallons of a mixture of water and 10 pounds of salt. Three gallons per minute of the mixture is drained off, and fluid containing one tenth of a pound of salt per gallon is flowing into the tank at the rate of two gallons per minute. Solve for the amount of salt in the tank at time t . In particular, how much salt is in the tank when the volume in the tank is 50 gallons?