

Ordinary Differential Equations (ENGR 213)
Fall 2019

Midterm exam (1)

Solve as many problems as you can. Each problem is worth 20%.
No books and notes are permitted. Calculators are permitted (and necessary).

Problem 1. Find the general solution of the equation

$$x y' + (x+1)y = e^{2x} .$$

Problem 2. Solve the Initial Value Problem

$$\frac{d y}{d x} = \frac{y}{x+2 y} ; \quad y(1) = 2 .$$

Problem 3. Find the general solution of the equation

$$y' + \tan x \cdot y = \sin x \cdot y^2 .$$

Problem 4. Find the general solution of the equation

$$\left(2 x y - \frac{1}{(x+2 y)^2} \right) d x + \left(x^2 - \frac{2}{(x+2 y)^2} + y^2 \right) d y = 0 .$$

Problem 5. On January 1, 2000, there was 1 g of a radioactive substance in the lab. By January 1, 2019, there remained just 0.8 g of the substance. How much of the substance will remain by January 1, 2100?

GOOD LUCK!