AMS 361: Applied Calculus IV

Homework 2

Assignment Date: Tuesday (01/12/2021) 2:00 PM EDT
Collection Date: Tuesday (01/19/2021) Before 2:30 PM EDT
Email Address: **TO:** charutamanikra.bamane@stonybrook.edu
CC: peng.zhang@stonybrook.edu
Grades: **4** problems are worth **100 points**.

Student ID:		
Student Name:		
Problems	Score	Remarks
2.1		
2.2		
2.3		
2.4		
Total Score:		

Problem 2.1 (25 points): Find the G.S. of the Riccati DE:

$$x^2y' + (xy)^2 - 2 = 0$$

Problem 2.2 (25 points): Find the G.S. of the Riccati DE:

$$x^3y' + x^2y - y^2 = 2x^4$$

given that $y_1 = cx^2$ is a solution.

Problem 2.3 (25 points): Find the G.S. of the DE:

$$x^2y' + 6x^2y^2 - 1 = 0$$

(hint: substituting $y = 1/z$.)

Problem 2.4 (25 points): Solving the following IVP:

$$\begin{cases} y' = \cos x - \dfrac{1}{2}\sin x \tan x + \dfrac{y^2}{2\cos x} \\ y(x = 0) = 2019 \end{cases}$$

Given that $y_1 = \sin x$ is a solution.

Reference to the Textbook is suggestive. Homework problems are not identical to those in the book but the solution methods are similar.