Introduction to Differential Equations
Assignment # 2

Date Given: April 18, 2022
Date Due: April 25, 2022

P1. (2 points) Find the solution of the initial value problem $ty' + 2y = t^2 - t + 1$, $y(1) = 1/2$, $t > 0$.

P2. (2 points) Find the solution of the initial value problem $ty' + 2y = 2\sin t$, $y(\pi/2) = 1$, $t > 0$.

P3. (1 point) Use the method of variation of parameter to solve the differential equation $y' + (1/t)y = 3\cos 2t$, $t > 0$.

P4. (1 point) Solve the differential equation $y' + y^2 \sin x = 0$.

P5. (1 point) Solve the differential equation $\dfrac{\mathrm{d}y}{\mathrm{d}x} = \dfrac{x^2}{1+y^2}$.

P6. (3 points) In this problem:

(a) Find the solution of the initial value problem $y' = 2x/(1+2y)$, $y(2) = 0$ in explicit form.

(b) Plot the graph of the solution.

(c) Determine the interval in which the solution is defined.