MATH 6701 - Homework 2

Justify all your anwsers

Problem 1 (5 points): Solve $\frac{y'}{x} + 2y = 1$ with $y(1) = 1$

Problem 2 (5 points): Find all the solution $y' = x/y$ with $y(4) = 5$.

Problem 3 (5 points): Find all the solution $y'' + 2y' + y = e^{-x}$ with $y(0) = y'(0) = 1$.

Problem 4 (5 points): Find the equilibrium points and their stability in the system
$\dot{x} = \frac{2e^x}{1+x^2} - e^x$

Problem 5 (5 points): Solve $\dot{x} = x + 2y$ and $\dot{y} = -2x + y$ with $x(0) = y(0) = 1$.

Problem 6 (5 points): Find the equilibrium points and their stability in the system $\dot{x} = xy + y$ and $\dot{y} = -y^2 + 3x - 3y + xy$.