

I. A3 MIDTERM 1 SAMPLE

1. Give the general solution of the following differential equation!

$$y' = \frac{x^2}{y(1+x^3)}.$$

2. Find the equilibrium solutions of the autonomous differential equation

$$y' = y(2 - y)$$

and characterize them from the point of view of stability.

3. Solve the following initial value problem

$$y'' + 8y' - 9y = 0, \quad y(1) = 1, \quad y'(1) = 0.$$

4. Give the general solution of the following differential equation!

$$y'' - 6y' + 9y = e^{3t}$$

5. Give the general solution of the following differential equation!

$$2x(\sin y + 1) + x^2 \cos y \cdot y' = 0.$$