

MAT 235 – ODE
Make Up Exam# 1

Name: _____

- 1) (15 points)** Find the explicit solution $y(x)$ of the following initial-value problem
 $y' = xy^2 + y^2 + xy + y$; $y(0) = 1$.

2) (15 points) Find a continuous solution for the initial-value problem

$$(x+2)\frac{dy}{dx} + y = \begin{cases} 2x, & 0 \leq x < 2 \\ 4, & x \geq 2 \end{cases}; \quad y(0) = 1$$

3) (15 points) Solve the differential equation $\frac{dy}{dx} = (3x + 2y + 1)^3 + (3x + 2y + 1) - \frac{3}{2}$.

4) (15 points) Solve the differential equation $x \frac{dy}{dx} + y = -2x^6 y^4$, for $x > 0$.

5) (15 points) Solve $(3x^2y^2)dx + (2x^3y + x^3y^4)dy = 0$.

- 6) (15 points)** Find the family of curves whose tangents form the angle $\frac{\pi}{4}$ with the hyperbolas $xy = c$.