

McGill University
Math 325B: Differential Equations
Assignment 2B: due Thursday, January 24, 2000

1. Find the solution of the initial value problem

$$yy' = xy^3, \quad y(0) = b > 0.$$

What is its interval of definition? (Your answer will depend on the value of b .) Sketch the graph of the solution when $b = \pm\frac{1}{2}, \pm 1, \pm 2$

2. Find the general solution of the differential equation

$$\frac{dy}{dx} + y^3x + y = 0.$$

What is the solution satisfying $y(0) = 1$.

3. Find the general solution of the differential equation

$$2xy \frac{dy}{dx} = x^2 + y^2.$$

Sketch the integral curves.

4. Solve the initial value problem

$$2xy \frac{dy}{dx} = (x-1)e^x + y^2, \quad y(1) = 1.$$