

Homework 5

1. Find the general solution of the differential equations

$$x^2y'' + 4xy' + 2y = 0,$$

$$x^2y'' - 3xy' + 4y = 0,$$

$$x^2y'' - 2xy' + 3y = 0.$$

2. Solve the initial value problems

$$2x^2y'' + xy' - 3y = 0, \quad y(1) = 1, y'(1) = 4,$$

$$x^2y'' - 3xy' + 4y = 0, \quad y(-1) = 2, y'(-1) = 3.$$

3. Use the power series method to solve the initial value problems

$$y' + xy = 0, \quad y(0) = 3,$$

$$y'' + xy' + y = 0, \quad y(0) = 1, y'(0) = 0.$$