

Homework 6

1. Find the general solutions of the differential equations

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

$$x^2y'' + 5xy' + 4y = 0,$$

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

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

$$2xy'' - y' + 2y = 0,$$

$$4xy'' + \frac{1}{2}y' + y = 0.$$

2. Solve the initial value problems

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

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

$$y'' - 2xy' + 8y = 0, \quad y(0) = 3, y'(0) = 0,$$