

Assignment 3

All four questions to be submitted.

1. Use the power series method to solve the given initial value problem

$$(x - 1)y'' - xy' + y = 0; \quad y(0) = -2, \quad y'(0) = 6$$

2. Obtain the series solution about the singular point $x = 0$. Form the general solution in the interval $(0, \infty)$

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

3. Obtain the two solutions for the following equation:

$$x^2y'' - 2xy' - (x^2 - 2)y = 0$$

Indicate how many unknown constants you expect.

Obtain the solution in terms of unknown constants.

4. Solve about $x=0$ singular point,

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