

Assignment-5

1. Find the general solution of the equation $9x(1-x)y'' - 12y' + 4y = 0$ around $x = 0$.
2. Find the Frobenius power series solutions for the equation $2x^2y'' + xy' - (1+x^2)y = 0, x > 0$.
3. Solve the ordinary differential equation $xy'' + y' - xy = 0, x > 0$.
4. Find the general solution of the equation $x(1+x)y'' + 3xy' + y = 0$ around $x = 0$.
5. Find the Frobenius power series solutions for the equation $x^2y'' + 6xy' + (6+x^2)y = 0, x > 0$.
6. Change the independent variable by the transformation $2x = z$ to solve the equation $x^2y'' + xy' + (4x^2 - v^2)y = 0$.
7. Use the transformation $y = x^2u, x^2 = z$ and change the dependent and independent variables y, x to u, z for the equation $x^2y'' - 3xy' + 4(x^4 - 3)y = 0$. Write the solution of the transformed equation in terms of Bessel functions.
8. Find the general solution of the equation $x^2y'' + xy' + (x^2 - \frac{1}{16})y = 0$.