

NORTH SOUTH UNIVERSITY

School of Engineering & Physical Sciences

Department of Mathematics & Physics

MAT 350 (Engineering Mathematics) - Section: 06

Assignment:04 Semester: Summer 2022

Question:

Solve the following differential equations:

1. $4x^2y'' + y = 0$
2. $x^2y'' + xy' + 4y = 0$
3. $xy'' + y' = x, \quad y(1) = 1, y'(1) = -\frac{1}{2}$
4. $x^2y'' - 5xy' + 8y = 0, \quad y(2) = 32, y'(2) = 0$
5. $xy'' - 3y' = 0$
6. $x^2y'' + xy' - y = \ln x$

Find a power series solution in powers of x.

7. $(1 - x^2)y'' - 2xy' + 2y = 0$
8. $y'' + (1 + x^2)y = 0$
9. $y'' - 4xy' + (4x^2 - 2)y = 0$
10. $y'' - y' + x^2y = 0$