

Math 240 - Assignment 7

March 26, 2026

Name _____

Score _____

Show all work to receive full credit. Supply explanations when necessary. This assignment is due April 2.

1. Find the first six nonzero terms of the power series solution centered at $x = 0$.

$$(x - 1)y' + y = 0$$

Based on the pattern in your solution, write the power series solution as an infinite sum in summation notation.

2. Find the first six nonzero terms of the power series solution centered at $x = 0$.

$$(x + 6)y' - y = 0$$

Based on the pattern in your solution, write the power series solution as an infinite sum in summation notation.

3. Find the first four nonzero terms of the power series solution centered at $x = 0$.

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

4. Find the first four nonzero terms of the power series solution centered at $x = 0$.

$$y'' - x^2y = 0$$

5. State the recurrence relation that describes the coefficients of the power series solution, and state the guaranteed (by our theorem) radius of convergence.

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