

Problem 4

In each of Problems 1 through 14:

- (a) Seek power series solutions of the given differential equation about the given point x_0 ; find the recurrence relation.
- (b) Find the first four terms in each of two solutions y_1 and y_2 (unless the series terminates sooner).
- (c) By evaluating the Wronskian $W(y_1, y_2)(x_0)$, show that y_1 and y_2 form a fundamental set of solutions.
- (d) If possible, find the general term in each solution.

$$y'' + k^2x^2y = 0, \quad x_0 = 0, \quad k \text{ a constant}$$