Written Assignment #12:
Power Series and Radius of Convergence
Due 5:00pm Tuesday, November 25, 2003

You are encouraged to collaborate with your colleagues. For credit, however, your final write-up must be done individually. Show all your work and make your presentation comprehensible.

1. Determine the radius of convergence for each of the following power series.
   (a) \[ \sum_{n=1}^{\infty} \frac{x^{3n+2}}{n} \]
   (b) \[ \sum_{n=0}^{\infty} \frac{n}{4^n} x^{2n} \]
   (c) \[ \sum_{n=1}^{\infty} \frac{(x - x_0)^n}{n} \], where \( x_0 \) is a given number.

2. Determine the Taylor series about the point \( x_0 \) for each of the following functions. Also determine the radius of convergence.
   (a) \[ \frac{x}{2 - x}, \quad x_0 = 0. \]
   (b) \[ \frac{x}{2 - x}, \quad x_0 = 5. \]