Chapter 11 Practice Test

Test the series for convergence or divergence

1)

$$\sum_{n=1}^{\infty} \frac{n-1}{n^3+1}$$

2)

$$\sum_{n=1}^{\infty} \frac{1}{n+n\cos^2 n}$$

3)

$$\sum_{n=1}^{\infty} \frac{\sin 2n}{1+2^n}$$

4)

$$\sum_{n=1}^{\infty} (-1)^n \frac{n^2 - 1}{n^2 + 1}$$

5)

$$\sum_{n=1}^{\infty} (-1)^{n-1} \frac{n^4}{4^n}$$

6)

$$\sum_{n=1}^{\infty} \frac{n!}{e^{n^2}}$$

7)

$$\sum_{n=1}^{\infty} \left(\frac{n}{n+1} \right)^{n^2}$$

8)

$$\sum_{n=1}^{\infty} n^2 e^{-n^3}$$

9)

$$\sum_{n=1}^{\infty} \left(\sqrt[n]{2} - 1 \right)^n$$

Find the radius of convergence and interval of convergence of the series

10)

$$\sum_{n=1}^{\infty} \frac{x^n}{2n-1}$$

11)

$$\sum_{n=0}^{\infty} \frac{(x-2)^n}{n^2+1}$$

Find a power series representation for the function and determine the radius of convergence.

12)

$$f(x) = \frac{x}{(1 + 4x)^2}$$

13)

$$f(x) = \frac{x^2}{x^4 + 16}$$

Use a Maclaurin series in Table 1 to obtain the Maclaurin series for the given function.

14)

$$f(x) = \sin(\pi x/4)$$