Not Use Calculator

1) Which of the following series converges?

A) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n}$

B) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{\sqrt{n}}$

C) $\displaystyle\sum_{n=1}^{\infty} n^{-5}$

D) $\displaystyle\sum_{n=1}^{\infty} n^{-3/4}$

2) Describe the convergence of $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{n^2}$.

A) Diverges

B) Converges absolutely

C) Converges conditionally

D) Cannot be determined.

3) Does the following series converge or diverge? (Show the test that leads to your conclusion)

$$\sum_{n=1}^{\infty} \frac{n^3}{4^n}$$

4) Determine if the following series converges absolutely, converges conditionally, or diverges?

$$\sum_{n=1}^{\infty} \frac{\cos n\pi}{n^{5/4}}$$

5) Determine if the following series converges absolutely, conditionally, or diverges.

$$\sum_{n=0}^{\infty} \frac{(-1)^n}{9n}$$

6) Does the following series converge or diverge? Show the test that leads to your conclusion.

$$\sum_{n=1}^{\infty} \frac{(6-5n)^n}{(2n)^n}$$

7) Determine whether the series $\sum_{n=1}^{\infty} \frac{n^3}{(5n-1)!}$ converges or diverges. Identify the test (or tests) you used.

8) Find the radius of convergence for $\displaystyle\sum_{n=0}^{\infty} \frac{(6x-4)^n}{n!}$.

Explain your answer.

9) Find the interval of convergence of the series $\displaystyle\sum_{n=0}^{\infty} \frac{(3x-1)^{3n}}{2^n}$ and, within this interval, the sum of the series as

a function of x.

10) Find the interval of convergence and the radius of convergence for $\displaystyle\sum_{n=0}^{\infty} \frac{n^3(2x-5)^n}{2^n}$.

Show the tests that lead to your conclusion.

11) For what values of x does the power series $\displaystyle\sum_{n=1}^{\infty} \frac{(x-1)^n}{\sqrt{n}}$ converge?

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12) a) Find all values of x for which the geometric series $\displaystyle\sum_{n=0}^{\infty} e^{nx}$ converges.

b) Find the function (sum) represented by the series $\displaystyle\sum_{n=0}^{\infty} e^{nx}$

c) Find all values of x for which $\displaystyle\sum_{n=0}^{\infty} e^{nx} > 2$

d) Find all values of x for which $\displaystyle\sum_{n=0}^{\infty} e^{nx} < 1$

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13) Let $f(x) = \displaystyle\sum_{n=0}^{\infty} \frac{(-2)^n x^n}{3^n (n+1)^2}$

(a) Find the interval of convergence of the series.

(b) For what values of x does the series converge absolutely?

(c) Find the domain (interval of convergence) of the following function:
$h(x) = f(x^2)$.