

Directions: Show all work on a separate sheet of paper for full credit.

1. Calculate the first eight terms of the sequence of partial sums to 4 decimals.

(a)  $\sum_{n=1}^{\infty} \frac{1}{\sqrt[3]{n}}$

(b)  $\sum_{n=1}^{\infty} \sin n$

2. Let  $a_n = \frac{2n}{3n+1}$ .

a) Determine whether  $\{a_n\}$  is convergent.

b) Determine whether  $\sum_{n=1}^{\infty} a_n$  is convergent.

3. Determine whether the geometric series is convergent or divergent. If it is convergent, find its sum.

(a)  $3 - 4 + \frac{16}{3} - \frac{64}{9} + \dots$

(b)  $2 + 0.5 + 0.125 + 0.03125 + \dots$

(c)  $\sum_{n=1}^{\infty} 12(0.73)^{n-1}$

(d)  $\sum_{n=1}^{\infty} \frac{(-3)^{n-1}}{4^n}$

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

4. Determine if the series are convergent or divergent. Explain.

(a)  $\sum_{n=1}^{\infty} 3^{n+1}4^{-n}$

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

(c)  $\sum_{n=1}^{\infty} (-0.2)^n + (0.6)^{n-1}$

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

(e)  $\sum_{n=1}^{\infty} \frac{1}{1 + (2/3)^n}$

(f)  $\sum_{n=1}^{\infty} \arctan(n)$

5. Find the values of  $x$  for which the series  $\sum_{n=0}^{\infty} \frac{(x-2)^n}{3^n}$ ,  $\sum_{n=1}^{\infty} (-5)^n x^n$  converges. Find the sum of the series.