MA 126-6A Spring 2003 Test 3
Name _____

1. Test the following series for convergence. If the series converges, find the sum.

(a)
$$\sum_{n=1}^{\infty}\left[\sin\left(\frac{1}{n}\right)-\sin\left(\frac{1}{n+1}\right)\right]$$

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

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

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

2. Test each of the following series to determine whether it converges or diverges.

(a)
$$\sum_{n=1}^{\infty}\frac{n^7}{2n^4+1}$$

(b)
$$\sum_{n=1}^{\infty}ne^{-n^2}$$

(c)
$$\sum_{n=1}^{\infty}\frac{6^n}{(n+1)^2 5^{n+3}}$$

3. Consider the series
$$\sum_{n=0}^{\infty}(-1)^n\frac{1}{3^n n!}.$$

(a) Show that this series converges.
(b) Estimate the sum of this series to within 0.005.

4. Estimate the sum of the series
$$\sum_{n=1}^{\infty}\frac{1}{n^4}$$
to within 0.006.