Name: _____

1. Use the Ratio Test to determine the convergence or divergence of the series $\sum_{n=1}^{\infty} n \left(\frac{7}{6}\right)^n$.

2. If the Ratio Test is applied to the series $\sum_{n=0}^{\infty} \frac{2^n}{(n+2)^n}$, which of the following inequalities results, implying that the series converges?

   A. $\lim\limits_{n \to \infty} \frac{2^n}{(n+2)^n} < 1$

   B. $\lim\limits_{n \to \infty} \frac{2^{n+1}}{(n+2)^{n+1}} < 1$

   C. $\lim\limits_{n \to \infty} \frac{(n+2)^{n+1}}{2^{n+1}} < 1$

   D. $\lim\limits_{n \to \infty} \frac{2(n+2)^n}{(n+3)^{n+1}} < 1$

3. If $a_n > 0$ for all $n$ and $\lim\limits_{n \to \infty} \frac{a_{n+1}}{a_n} = \frac{4}{3}$, which of the following series converges?

   A. $\sum_{n=1}^{\infty} \frac{a_n}{n^2}$

   B. $\sum_{n=1}^{\infty} a_n \left(\frac{5}{3}\right)^n$

   C. $\sum_{n=1}^{\infty} \frac{a_n}{n^4}$

   D. $\sum_{n=1}^{\infty} \frac{a_n}{4^n}$

4. What are all values of $x > 0$ for which the series $\sum_{n=1}^{\infty} n \left(\frac{4}{x}\right)^n$ converges?

5. Which of the following series converge?

   I. $\sum_{n=1}^{\infty} \frac{n 4^n}{n!}$

   II. $\sum_{n=1}^{\infty} \frac{\ln n}{n^2}$

   III. $\sum_{n=1}^{\infty} \left(\frac{2e}{3}\right)^n$

   A. I only

   B. I and II only

   C. I and III only

   D. I, II, and III