Textbook problems from Stewart *Calculus*, 7th edition.

- §11.10: 29, 31, 37, 47, 50, 63, 64, 65, 66, 67, 68, 69

Supplementary problems:

1. Evaluate each of the following sums. You do not have to show that the sum converges.

   (a) $\displaystyle\sum_{n=0}^{\infty} \frac{2^n}{3^n \cdot n!}$

   (b) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{n \cdot 3^n}$

   (c) $\displaystyle\sum_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)! \cdot 4^n}$

   (d) $\displaystyle\sum_{n=0}^{\infty} \frac{(-1)^n}{(2n+1) \cdot 4^n}$

2. Evaluate each of the following sums (answer as a function of x). You do not have to show that the sum converges.

   (a) $\displaystyle\sum_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)!} x^n$ (assume $x \geq 0$)

   (b) $\displaystyle\sum_{n=0}^{\infty} \frac{1}{n!} x^{3n}$

   (c) $\displaystyle\sum_{n=0}^{\infty} \frac{(-3)^n}{(2n)!} x^n$ (assume $x \geq 0$)

   (d) $\displaystyle\sum_{n=1}^{\infty} \frac{e^7}{n!} (x-7)^n$

3. Find a series whose sum is $\int_0^1 x \ln(1+x^3)\, dx$. Use this series to estimate the value of this integral, with error less than $\frac{1}{20}$ (use the method described on page 754 for estimating the accuracy of a partial sum of an alternating series).

4. Find a series whose sum is $\int_0^1 x \sin(x^2)\, dx$. Use this series to estimate the value, with error less than $\frac{1}{1000}$.

5. Use a series to estimate $e^{-1/3}$, with error less than $\frac{1}{100}$.