Lab 10 - Series

1. Do the following alternating series converge absolutely, converge conditionally, or diverge?

   (a)

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

   (b)

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

2. For each of the following series, tell whether the series converges or diverges, and if possible, tell what it converges to. (If it is not possible to tell, then simply say that.)

(a)

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

(b)

$$\sum_{n=2}^{\infty} \frac{1}{(\ln n)^n}$$

(c)

$$3 + \frac{3}{2} + \frac{3}{4} + \frac{3}{8} + \frac{3}{16} + \cdots$$

3. For what values of x does the following series converge?

$$\sum_{n=1}^{\infty} e^{nx}$$

4. Given that:

$$\frac{1}{1-x} = 1 + x + x^2 + x^3 + x^4 + \cdots = \sum_{n=0}^{\infty} x^n$$

find the Maclaurin series for

$$\frac{2}{6-x}$$