

**Assignment #12****Name** \_\_\_\_\_**Due 27 April 2015**

1. Find the Maclaurin series for  $\sinh(x)$  and  $\cosh(x)$ .

2. Show that the Maclaurin series  $\sum_{k=0}^{\infty} (-1)^k \frac{x^{2k}}{(2k)!}$  converges  $\cos(x)$  for each  $x$  by showing that  $|R_N(x)| \rightarrow 0$  as  $N \rightarrow \infty$ .

3. In each case, find the *exact* sum of the series:

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

(b) 
$$\sum_{n=0}^{\infty} (-1)^n \frac{\pi^{2n+1}}{2^{2n+1} (2n+1)!}$$

(c) 
$$\sum_{n=2}^{\infty} (-1)^n \frac{\pi^{2n}}{(2n)!}$$

4. In each case, find the Maclaurin series for the given function.

(a)  $x^5 e^{3x}$ .

(b)  $(1 + x^2) \sin(x)$