Department of Mathematics, Bennett University
Engineering Calculus (EMAT101L)
Tutorial Sheet 7 (Power series and Taylor series)

1. Find radius and interval of convergence of following power series:

   (a) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^n} x^n$

   (b) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^n} (x-5)^n$

   (c) $\displaystyle\sum_{n=1}^{\infty} 4^n x^n$

   (d) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{4^n} x^n$

   (e) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{3^n + 1} x^n$

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

   (g) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^p} x^n$

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

   (i) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n n}{4^n} (x+3)^n$

   (j) $\displaystyle\sum_{n=1}^{\infty} \frac{2^n}{n} (4x-8)^n$

   (k) $\displaystyle\sum_{n=1}^{\infty} n!(2x+1)^n$

   (l) $\displaystyle\sum_{n=1}^{\infty} \frac{(-4)^n}{(n+2)!} (x+3)^n$

   (m) $\displaystyle\sum_{n=1}^{\infty} \frac{(x-2)^n}{10^n}$

   (n) $\displaystyle\sum_{n=1}^{\infty} (-1)^n (4x+1)^n$

2. Find Taylor series of following functions about given points.

   (a) $\sin x$ about $c = 0$

   (b) $\cos x$ about $c = 0$

   (c) e^{-x} about $c = 0$

   (d) $\ln x$ about $c = 2$

   (e) $\frac{1}{x^2}$ about $c = -1$

   (f) e^{-x} about $c = -4$