WORKSHEET FOR 4/6/2009

Reading assignment. Section 11.6
Homework due Wednesday. 7, 9, 12, 14, 21, 22, 26, 27, 28, 39, 40

Exercises:

(1) *Review Questions:*

(a) Write down the definition of what it means if $\sum_{k=0}^{\infty} a_k(x-x_0)^k$ converges (i.e. write down the definition of convergence applied to this series).

(b) What does it mean if $[b,c]$ is the interval of convergence of the series in part (a)? What is the radius of convergence for this series?

(2) Let:

$$S_1(x) = \sum_{k=0}^{\infty} \frac{x^k}{k!}$$

$$S_2(x) = \sum_{k=0}^{\infty} \frac{x^k}{3^k+2}$$

$$S_3(x) = \sum_{k=0}^{\infty} \frac{(-1)^k x^{2k+1}}{(2k+1)!}$$

$$S_4(x) = \sum_{k=0}^{\infty} \frac{(-1)^k x^{2k}}{(2k)!}$$

(a) Find the radius of convergence for each of the above series. (Hint: each of these series converges absolutely.)

(b) Find the series for $S_1'(x)$. Which of the above series is $S_1'(x)$ equal to?

(c) Find the series for $S_3'(x)$. Find a simple expression for $S_3'(x)$ in terms of $S_4(x)$.

(d) Show that $S_4'(x) = S_3(x)$.

(e) Where does the series for $S_2'(x)$ converge?