AP Calculus BC Practice 3.2: Power Series

Find the radius and the interval of convergence of the power series. (Be sure to include and check for convergence at the end points of the interval.)

		IOC	ROC
1)	$\sum_{n=1}^{\infty} \frac{(-1)^n x^n}{n}$	$(-1, 1]$	1
2)	$\sum_{n=0}^{\infty} \frac{x^n}{n!}$	$(-\infty, \infty)$	∞
3)	$\sum_{n=1}^{\infty} \frac{(-1)^{n+1} x^n}{4^n}$	$(-4, 4)$	4
4)	$\sum_{n=1}^{\infty} \frac{n}{n+1}(-2x)^{n-1}$	$(-\frac{1}{2}, \frac{1}{2})$	$\frac{1}{2}$
5)	$\sum_{n=1}^{\infty} \frac{(-1)^n x^{2n}}{n!}$	$(-\infty, \infty)$	∞

Find: (a) $f(x)$ given, (b) $f'(x)$, (c) $f''(x)$, and (d) $\int f(x)dx$. Also find the interval of convergence for a-d. Be sure to check for convergence at the endpoints of the interval!

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

a) $(0, 2]$

b) $f'(x) = \sum (-1)^{n+1}(x-1)^n$ $(0, 2)$

c) $f''(x) = \sum (-1)^{n+1} n (x-1)^{n-1}$ $(0, 2)$

d) $\int f(x)dx = \sum \frac{(-1)^{n+1}(x-1)^{n+2}}{(n+1)(n+2)}$ $[0, 2]$