Math 143 Midterm 1

Name: _____

1. Do these series converge? Which test are you using?

a. $\sum_{n=0}^{\infty} \frac{(-1)^n}{\sqrt{n}+3}$

b. $\sum_{n=0}^{\infty} \frac{(n!)^2}{(2n)!}$

c. $\sum_{n=2}^{\infty} \frac{\ln n}{n^3}$

2. Find the interval and radius of convergence for these series:

a. $\sum_{n=1}^{\infty} \frac{1}{(2n+1)}(x-2)^{2n+1}$

b. $\sum_{n=4}^{\infty} \frac{1}{2^n-3}x^n$

3. Find the Taylor series for $f(x) = \ln(x+2)$ centered at $x = 2$. Write the answer using sigma notation.

4. Let $f(x) = \sqrt{5+2x}$.

a. Find the degree 2 Taylor polynomial for $f(x)$ at $x = 0$.

b. Find a bound on the error when approximating $f(1)$ by taking $x = 1$ in part a.