Math 1b Sum. 2019 - 7/29/19

Exam 3 Practice **Name:**

Determine whether the following series converge absolutely, converge conditionally, or diverge. Be sure to clearly state what test you are using and the conclusion you come to.

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

(2) $\displaystyle\sum_{n=1}^{\infty} (-1)^{n+1} \frac{\log n}{n^2}$

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

(4) $\displaystyle\sum_{n=1}^{\infty} \frac{2^n (2n)!}{(n+5)!}$

(5) $\displaystyle\sum_{n=1}^{\infty} \frac{n^n}{n!}$

(6) $\displaystyle\sum_{n=1}^{\infty} (-1)^n \sqrt[n]{2 - \frac{1}{n}}$

Compute the radius and interval of convergence for the following power series.

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

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

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

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

Determine the Taylor series for the given function about the indicated center, using any method of your choosing.

(1) $f(x) = e^{3x},\ x = 0$

(2) $f(x) = \frac{1}{2-x},\ x = 1$

(3) $f(x) = \sin(x)\cos(x),\ x = 0$

(4) $f(x) = \log(1 + x^2),\ x = 0$

(5) $f(x) = e^{x^3},\ x = 1$

(6) $f(x) = \tan x,\ x = 0$

Compute the sum of the convergent series using your knowledge of Taylor series.

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

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

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

(4) $\displaystyle\sum_{n=0}^{\infty}\frac{3^n}{n!}$