SI Session Exam III Review | Prof. Stockton : Calculus II : Spring 2008

April 19th 12:00 PM – 2:00 PM Rm. 1229 | SI Leader : Neil Jody

[1] Determine if each of the following *sequences* converges or diverges. If it converges, indicate the limit.

(a) $a_n = \dfrac{2^n + 1}{2^{n+1}}$

(b) $a_n = (-1)^n \sqrt[n]{n}$

[2] Find the sum of the following convergent series: $\displaystyle\sum_{n=0}^{\infty} \frac{(-1)^n 2^{n-2}}{3^n}$

[3] Determine if each series converges or diverges. Indicate the convergence tests used.

(a) $\sum_{n=1}^{\infty} \frac{\sqrt[3]{n^2-1}}{n^2+3}$

(b) $\sum_{n=1}^{\infty} \frac{3^n n!}{(2n)!}$

(c) $\sum_{n=1}^{\infty} \frac{\ln n}{n^2}$

[4] Determine if each series is *absolutely* convergent, *conditionally* convergent, or divergent. Indicate the convergence tests used.

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

(b) $\sum_{n=0}^{\infty}\frac{\cos^n n}{(n+2)^n}$

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

[5] Determine the *radius* of convergence for each of the following power series.

(a) $\sum_{n=0}^{\infty} \frac{n!}{(2n)!}(x+1)^n$

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

[6] Find the *interval* of convergence of the following power series.

$$\sum_{n=0}^{\infty} \frac{10^{n+1}}{3^{2n}} x^n$$

[7] Let $f(x)=\sum_{n=1}^{\infty}\frac{2^n}{n}(x-1)^n$. Find: (a) $f'(x)$, (b) $\int f(x)\,dx$, (c) the intervals of convergence for $f'(x)$, $f(x)$, and $\int f(x)\,dx$.