WORKSHEET 07/12/2016

1. Determine which of the following series absolutely converge, conditionally converge or diverge :

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

$\sum_{n=1}^{\infty}(-1)^{n}\frac{10^n}{(n+1)!}$ $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{(0.1)^n}{n}$ $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{n!}{2^n}$

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

2. a) Find the series' radius and interval of convergence. For what values of x does the series converge b) absolutely c) conditionally:

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

$\sum_{n=1}^{\infty}\frac{n(x+3)^n}{5^n}$ $\sum_{n=1}^{\infty}(1+\frac{1}{n})^n x^n$ $\sum_{n=1}^{\infty} n!(x-4)^n$

3. The series

$$\sec x = 1 + \frac{x^2}{2} + \frac{5}{24}x^4 + \frac{61}{720}x^6 + \frac{277}{8064}x^8 + ...$$

converges to $\sec x$ for $-\pi/2 < x < \pi/2$.

a. Find the first five terms of a power series for the function $\ln|\sec x + \tan x|$. For what values of x should the series converge?

b. Find the first four terms of a series for $\sec x \tan x$. For what values of x should the series converge?