

Math 181
Fall 2009

Name _____

Homework #18

Due Monday, November 9

No late papers accepted! No excuses!

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

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

$$\text{b) } \sum_{n=1}^{\infty} \frac{(x+4)^n}{n3^n}$$

2. The series $e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots$ converges to e^x for all x .

a) Find a series for $\frac{d}{dx}e^x$.

b) Find a series for $\int e^x dx$

c) Replace x by $-x$ in the series for e^x to find a series that converges to e^{-x} for all x .

Then multiply the series for e^x and e^{-x} to find the first six terms of a series for $e^x \cdot e^{-x}$.,