

**Math 231 Homework 6**

Due May 6<sup>th</sup> Submit at the beginning of the class (Put into the box with your TA's name)  
Do the calculation and write the numbers during the process

1. Use the Ratio Test to determine whether the series is convergent or divergent.

a)  $\sum_{n=1}^{\infty} \frac{n}{5^n}$

b)  $\sum_{n=1}^{\infty} \frac{10^n}{(n+1)4^{2n+1}}$

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

2. Use the Root Test to determine whether the series is convergent or divergent

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

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

3. Test the series convergent or divergent

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

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

4. Find the radius of convergence and interval of convergence of the series

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

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

5. Find power representation of function

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