**Math 201** **Practice Problems** for Quiz I

1) Find the following limits. Justify your answer.







**2)** Investigate convergence/divergence of the following series

Warning: The big hints/tricks below will not be given on the Quiz (but very easy to remember!)



  f) 



 (Warning: “getting closer to 1” fails) 

**3)** Find the domain of convergence of the following power series. Also indicate absolutely or conditionally.

a)  

**4)** a)Find according to the values of c the series sum  **Telescopic)**

b) What can you say about

(Hint: One of the cases of convergent /divergent is easily seen to be impossible!)

**5)**  Find  (**Hint** : Use  if this last exists) **Careful !!!**

**5\*|** Find  (**Hint** : Use  if this last exists)

**6a)** p. 583: 39, 40, 42 ( MORE “Find interval of convergence”)

**6b)** p. 608: 20, 27 (MORE LCT problems)

7) Let  . Find  (via the Maclaurin series of *f(x)*.

**8)** Let 

(i) Find the Taylor series of f(x) at a=2 with its domain of convergence. (Hint: x=2+(x-2))

(ii) Find

**9)** Find value of the following



**10) 10.10** (p. 603) **:** 15, 17, 20,22 Estimate the definite integrals (in such problems) by using the first two non-zero terms of the relevant series

**10\*)** **10.10** (p. 603) : 25, 59, 55, 5

**11)** Suppose ****. Moreover, 

(a) Find the Maclaurin series of *f* (x).

(b) Show that = its Maclaurin series

(c) Find the exact value of  (Look carefully at its series)

(d)If we approximate *f*(x) ~ P10 (where P10 is the Maclaurin polynomial of *f* (x)),

estimate the error in such approximation on the interval 0 < x < 2.

**12)** (***Discovery***)Find (Yes: ln n is increasing) & **deduce **