Calculus II, Spring 2004

Quiz 1

Mar 04 2004,

Show all details.

(1) (50 pts) State, without proof, five Theorems/Tests about convergence of series.

(2) (10 pts) Use the following fact

$$\frac{1}{1-x} = 1 + x + x^2 + \cdots, \qquad |x| < 1$$

to evaluate $\sum_{n=0}^{\infty} \frac{n}{3^n}$.

(3) (20 pts) Find a power series whose interval of convergence is given by the following intervals respectively.

(a) (1,2) (b) (1,2] (c) [1,2) (d) [1,2]

(4) (20 pts) Determine if the following series converges, or find the radius of convergence:

(a) $\sum_{n=2}^{\infty} \frac{1}{n(\ln n)^{1.01}}$ (b) $\sum_{n=1}^{\infty} (\frac{1}{n} - (\frac{1}{n})^2)^n$

(c) $\sum_{n=1}^{\infty} \frac{\cos n\pi}{n\sqrt{n}}$ (d) $\sum_{n=1}^{\infty} (1 + \frac{1}{n})^n x^n$

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