Math 142
Calculus II
Fall 2001, USC

Oct 24, 2001

Quiz 9

Time:10min

Choose any two of the following three problems:

1. Consider the sequence:

$$\frac{1}{2^2}, \quad \frac{2}{2^3}, \quad \frac{3}{2^4}, \quad \frac{4}{2^5}, \quad \cdots$$

(i) Find an explicit formula for the general term (a_n=?). (ii) Does the sequence converge? (iii) If so, what is the limit?

2. Show that the harmonic series diverges.

3. Show that

$$1 + r + r^2 + r^3 + r^4 + r^5 + \cdots = \frac{1}{1-r}, \quad \text{when} \quad |r| < 1.$$

LaTeX ..... MG