

Name: SOLUTIONS

Quiz #10 - March 30, 2007

1. Complete the following definition precisely.

A sequence $\{a_n\}$ has **limit L**, and we write

$$\lim_{n \rightarrow \infty} a_n = L$$

if

For any $\epsilon > 0$ there exists an $N > 0$ such that if $n > N$ then $|a_n - L| < \epsilon$.

2. Find a formula for the general term a_n of the sequence, assuming the pattern of the first few terms continues:

$$\left\{ \frac{3}{3}, \frac{-5}{9}, \frac{7}{27}, \frac{-9}{81}, \frac{11}{243}, \frac{-13}{729}, \dots \right\}$$

$$a_n = (-1)^{n+1} \frac{2n+1}{3^n}$$

3. Find the limit of the sequence as $n \rightarrow \infty$ or write DNE if the sequence diverges:

a. $\{1, -0.1, 1/2, -0.01, 1/3, -0.001, 1/4, -0.001, \dots\}$

Limit is 0.

b. $a_n = \frac{2n+1}{6n-5}$

Limit is $2/3$

c. $\{1, 0, 1, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, \dots\}$

Diverges.