Sequences

BC # 7

A **sequence** is a function whose domain is the set of positive integers.

A sequence **converges** if it has a finite limit as $n \to \infty$.

A sequence **diverges** if it does not have a finite limit as $n \to \infty$.

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1. a) Write the first four terms of the sequence with $a_n = 2^{1/2^x}$.

   b) Does the sequence converge? c) If so, to what number?

2. Show that the sequence $a_n = \frac{1}{n}$ either converges or diverges.

3. Find the nth term (a_n) of the sequence below.

   $2, \frac{4}{3}, \frac{8}{5}, \frac{16}{7}, \frac{32}{9}, \ldots$

4. Show that the sequence 1, -1, 1, -1, 1, ... either converges or diverges.