Recall

1. $\mathbb{N} \doteqdot \{1, 2, 3, \ldots\}$ the set of natural numbers (i.e., positive integers)

2. $\mathbb{R}$ means the set of real numbers

A (real-valued) sequence is a function $x : \mathbb{N} \to \mathbb{R}$. We often denote a sequence by

$$\langle x(n) \rangle \text{ or } \langle x_n \rangle \text{ or } \langle x_n \rangle_{n \in \mathbb{N}},$$

where $x_n \doteqdot x(n)$.

Background information about #47. (Not necessary to do the problem.) We will go into more detail later in the course.

The following definition is on p. 270 (§9.1) of Fletcher and Patty.

Let $\langle x_n \rangle$ be a sequence of real numbers and let A be a real number. We say that $\langle x_n \rangle$ **converges to** A if for every positive number ε there is a natural number N such that if $n > N$, then

$$|x_n - A| < \varepsilon.$$

We denote this by $\langle x_n \rangle \to A$.

A sequence **converges** if there is a real number A such that $\langle x_n \rangle \to A$.

If $\langle x_n \rangle$ does not converge, then it is said to diverge.