"Proof" of Task 30

We will prove this by contraposition. Let (a_n) be the given sequence. Suppose the conclusion of Task 30 is false, i.e., assume for all $\varepsilon > 0$ and for all subsequences (a_{n_k}) we have for all $k \in \mathbb{N}$ that

$$|a_{n_k} - L| \leq \varepsilon.$$

This means that all subsequences of (a_n) converge to L, so in particular, (a_n) itself converges to L.