

Proof. Let $N \in \mathbb{N}$ such that $\frac{1}{N} < \epsilon$ (By [LINK TO ARCHIMEDIAN PROPERTY](#)). Then let $n > N$ such that:

$$\begin{aligned} n > N &> \frac{1}{\epsilon} \\ \frac{1}{n} &< \frac{1}{N} < \epsilon && \text{taking reciprocals} \\ \left| \frac{1}{n} - 0 \right| = \left| \frac{1}{n} \right| = \frac{1}{n} &< \epsilon && \text{since } \frac{1}{n} \text{ is always positive for } n \in \mathbb{N} \end{aligned}$$

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