Proof. Let $N \in \mathbb{N}$ such that $\frac{1}{N} < \varepsilon$ (By the Archimedean Property). Then let $n \geq N$ such that

$$\begin{aligned} & n \geq N \quad \forall n \geq \\ & \frac{1}{n} \leq \frac{1}{N} < \varepsilon \\ & \left|\frac{1}{n} - 0\right| = \left|\frac{1}{n}\right| \\ & = \frac{1}{n} \end{aligned}$$

taking reciprocals

since $\frac{1}{n}$ is always positive for $n \in \mathbb{N}$

■