Show that the 1-point compactification of $\mathbb{Z}_+$ is homeomorphic with the subspace $\{0\} \cup \{1/n \mid n \in \mathbb{Z}_+\} = Y$ of $\mathbb{R}$

$\mathbb{Z}_+$ and $\{1/n \mid n \in \mathbb{Z}_+\}$ are locally compact as they are simply ordered sets with the least upper bound property

letting $f(n) = \frac{1}{n}$ and equipping $\mathbb{Z}_+$ with the discrete topology we see that f^{-1} is clearly continuous for any n:

$f(n) = \frac{1}{n} = \left(\frac{1}{n+1}, \frac{1}{n-1}\right) \cap Y$ which is then open,

thus f is a homeomorphism. By exercise 5 their 1 point compactifications are homeomorphic