MATHEMATICAL LOGIC — ASSIGNMENT THREE

(1) Show that the collection $\mathbb{N}^*$ of finite sequences over the naturals is in bijective correspondence with $\mathbb{N}$.
(2) State, without proving, the Zorn Lemma.
(3) In the pure λ-calculus, let $V \equiv \lambda y.x\,(y\,y)$ and let $R \equiv \lambda x.\,V\,V$. Show that, for all z, $R\,z =_\beta z\,(R\,z)$.

Each question is worth 12 points. The points in all the four assignments will be added together and the result will be divided by 4, and this will be the final result. Remember to mark your answer sheet with your name.

Date: May 22$^{\text{nd}}$, 2023.