MATHEMATICAL LOGIC — ASSIGNMENT THREE

(1) Define ordinal multiplication.
(2) Prove that there is no enumeration $\left\{ f_x \right\}_{x \in \mathbb{N}}$ of all total computable functions which admits a computable enumeration function $e(x, z) = f_x(z)$.
(3) Show that $\lambda x.\, \mathsf{K}\, x$ is strongly normalisable, but there are two λ-terms A and B such that $(\lambda x.\, \mathsf{K}\, x)\, A\, B$ is not strongly normalisable.

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 14^{th}, 2026.