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Abstract: We present a question concerning associative operations \oplus defined on the class of linear orders LO that resemble the standard sum.

Let LO denote the class of linear orders. A binary operation \cdot is *associative* on LO if for all linear orders X, Y, Z we have $X \cdot (Y \cdot Z) \cong (X \cdot Y) \cdot Z$. We write $+$ for the usual sum on LO and $+^*$ for the reverse sum defined by the rule $X +^* Y \cong Y + X$. Both $+$ and $+^*$ are associative.

Suppose that \oplus is an associative binary operation on LO such that for all linear orders A and B we have that $A \oplus B$ is isomorphic either to $A + B$ or to $B + A$. We are interested in the following question.

Question: Must \oplus coincide with one of $+$ and $+^*$?