

$$\begin{array}{l}
\text{reduce}(+,0) \circ \text{map}(\ast) \circ \text{zip}(\mathbf{x}, \mathbf{y}) \\
\text{4.e} \quad \text{reduce}(+,0) \circ \text{part-reduce}(+,0) \circ \text{map}(\ast) \circ \text{zip}(\mathbf{x}, \mathbf{y}) \\
\text{4.e} \quad \text{reduce}(+,0) \circ \text{outerJoin}^n \circ \text{map}(\text{part-reduce}(+,0)) \circ \text{outerSplit}^n \circ \text{map}(\ast) \circ \text{zip}(\mathbf{x}, \mathbf{y}) \\
\text{4.d} \quad \text{reduce}(+,0) \circ \text{outerJoin}^n \circ \text{map}(\text{part-reduce}(+,0)) \circ \text{outerSplit}^n \circ \text{outerJoin}^n \circ \text{map}(\text{map}(\ast)) \circ \text{outerSplit}^n \circ \text{zip}(\mathbf{x}, \mathbf{y}) \\
\text{4.g} \quad \text{reduce}(+,0) \circ \text{outerJoin}^n \circ \text{map}(\text{part-reduce}(+,0)) \circ \text{map}(\text{map}(\ast)) \circ \text{outerSplit}^n \circ \text{zip}(\mathbf{x}, \mathbf{y}) \\
\text{4.h} \quad \text{reduce}(+,0) \circ \text{outerJoin}^n \circ \text{map}(\text{part-reduce}(+,0) \circ \text{map}(\ast)) \circ \text{outerSplit}^n \circ \text{zip}(\mathbf{x}, \mathbf{y}) \\
\text{4.e/5.b} \quad \text{reduce}(+,0) \circ \text{outerJoin}^n \circ \text{map}(\text{reduce-seq}(+,0) \circ \text{map-seq}(\ast)) \circ \text{outerSplit}^n \circ \text{zip}(\mathbf{x}, \mathbf{y}) \\
\text{5.a} \quad \text{reduce}(+,0) \circ \text{outerJoin}^n \circ \text{map}(\text{reduce-seq}(\lambda \text{ acc}, \langle a, b \rangle: \text{acc} + a \ast b, 0)) \circ \text{outerSplit}^n \circ \text{zip}(\mathbf{x}, \mathbf{y}) \\
\text{4.h} \quad \text{reduce}(+,0) \circ \text{outerJoin}^n \circ \text{map}(\text{reduce-seq}(\lambda \text{ acc}, \langle a, b \rangle: \text{acc} + a \ast b, 0)) \circ \text{outerSplit}^n \circ \text{zip}(\mathbf{x}, \mathbf{y})
\end{array}$$