

$$\begin{aligned} \text{apply}(\langle \mathbf{R}_x, \mathbf{t}_y \rangle, \text{apply}(\langle \mathbf{R}_y, \mathbf{t}_y \rangle, \mathbf{p})) &= \text{apply}(\langle \mathbf{R}_x, \mathbf{t}_x \rangle, \mathbf{R}_y \mathbf{p} + \mathbf{t}_y) \\ &= \mathbf{R}_x \mathbf{R}_y \mathbf{p} + \mathbf{R}_x \mathbf{t}_y + \mathbf{t}_x. \end{aligned}$$