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