$P = (x_1, y_1)$, $Q = (x_2, y_2)$

$(x_2, y_2) = \tau \rho^{\ell}((x_1,y_1) \oplus_0 (x_2,y_2))$

$\tau \rho^{-\ell}(x_2,y_2) = (x_1,y_1) \oplus_0 (x_2,y_2)$

(lhs)

$$((x_1,y_1) \oplus_0 (x_2,y_2)) \oplus_0 \tau i (x_2,y_2) =$$

$$= (\tau \rho^{-\ell}(x_2,y_2)) \oplus_0 \tau i(x_2,y_2) =$$

inversion invariance and $\tau \circ \tau = id$

$$= \rho^{-\ell}(x_2,y_2) \oplus_0 i(x_2,y_2) =$$

rotation invariance

$$= \rho^{-\ell}((x_2,y_2) \oplus_0 i(x_2,y_2)) =$$

inverse generalized (there is no delta condition for this in the projective setting)

$$= \rho^{-\ell}(1,0)$$

(rhs) .

If we assume that we get to the right hand-side we get $[\tau P, 0] = [\tau(x_1,y_1), 0] = \{((x_1,y_1),0), (\tau(x_1,y_1),1)\}$ since $x_1 \neq 0, y_1 \neq 0$ and (x_1,y_1) is an affine point.

However $[\rho^{-\ell}(1,0), 0] = \{(\rho^{-\ell}(1,0), 0)\}$ since $\rho^{-\ell}(1,0)$ has one zero component and is an affine point.

The index 0 of the sum above is fixed by the deduction and cannot be changed as after applying associativity ...