

Step 4

The diagram illustrates the following relationships and maps:

- Top Row:**
 - $S^0 \xrightarrow{\rho_{S^0}^{Sets_*, -1}} S^0 \wedge S^0 \xrightarrow{id_{Sets_*|S^0, S^0}^{\otimes, -1}} S^0 \otimes_{Sets_*} S^0 \xrightarrow{id_{S^0} \wedge id_{\mathbb{1}|Sets_*}^{\otimes, -1}} S^0 \otimes_{Sets_*} \mathbb{1}_{Sets_*}$
- Bottom Row:**
 - $X \xrightarrow{\rho_X^{Sets_*, -1}} X \wedge S^0 \xrightarrow{id_{Sets_*|X, S^0}^{\otimes, -1}} X \otimes_{Sets_*} S^0 \xrightarrow{id_X \wedge id_{\mathbb{1}|Sets_*}^{\otimes, -1}} X \otimes_{Sets_*} \mathbb{1}_{Sets_*}$
- Vertical and Diagonal Maps:**
 - $S^0 \xrightarrow{[x]} X$
 - $S^0 \wedge S^0 \xrightarrow{[x] \wedge id_{S^0}} X \wedge S^0$
 - $S^0 \otimes_{Sets_*} S^0 \xrightarrow{[x] \otimes_{Sets_*} id_{S^0}} X \otimes_{Sets_*} S^0$
 - $S^0 \otimes_{Sets_*} \mathbb{1}_{Sets_*} \xrightarrow{[x] \wedge id_{\mathbb{1}_{Sets_*}}} X \otimes_{Sets_*} \mathbb{1}_{Sets_*}$
 - $\rho_{S^0}'^{-1}: S^0 \wedge S^0 \rightarrow S^0 \otimes_{Sets_*} \mathbb{1}_{Sets_*}$ (labeled (1))
 - $\rho_X'^{-1}: X \wedge S^0 \rightarrow X \otimes_{Sets_*} \mathbb{1}_{Sets_*}$ (labeled (2))
 - $\rho_{S^0}'^{-1} \circ [x] \wedge id_{S^0} = [x] \otimes_{Sets_*} id_{S^0} \circ id_{Sets_*|X, S^0}^{\otimes, -1}$ (labeled (3) and (4))
 - $\rho_X'^{-1} \circ id_{Sets_*|X, S^0}^{\otimes, -1} = id_X \wedge id_{\mathbb{1}|Sets_*}^{\otimes, -1} \circ \rho_{S^0}'^{-1} \circ [x] \otimes_{Sets_*} id_{S^0}$ (labeled (5))