

Step 1

$$\begin{array}{ccccc}
 & S^0 \wedge S^0 & \xrightarrow{\text{id}_{\text{Sets}_*|S^0, S^0}^{\otimes, -1}} & S^0 \otimes_{\text{Sets}_*} S^0 & \xrightarrow{S^0 \text{id}_{S^0} \wedge \text{id}_{\mathbb{1}/\text{Sets}_*}^{\otimes, -1}} \\
 \nearrow \rho_{S^0}^{\text{Sets}_*, -1} & \downarrow & \text{(\text{2})} & \downarrow & \\
 S^0 & \xrightarrow{\rho_{S^0}^{\prime, -1}} & S^0 \otimes_{\text{Sets}_*} \mathbb{1}_{\text{Sets}_*} & & \\
 \downarrow [x] & \downarrow [x] \wedge \text{id}_{S^0} & \text{(1)} & \downarrow [x] \otimes_{\text{Sets}_*} \text{id}_{S^0} & \downarrow [x] \wedge \text{id}_{\mathbb{1}/\text{Sets}_*} \\
 & \downarrow & \text{(5)} & \downarrow & \\
 & X \wedge S^0 & \xrightarrow{\text{id}_{\text{Sets}_*|X, S^0}^{\otimes, -1}} & X \otimes_{\text{Sets}_*} S^0 & \xrightarrow{-\text{id}_X \wedge \text{id}_{\mathbb{1}/\text{Sets}_*}^{\otimes, -1}} \\
 \nearrow \rho_X^{\text{Sets}_*, -1} & \downarrow & \text{(\text{2})} & \downarrow & \\
 X & \xrightarrow{\rho_X^{\prime, -1}} & X \otimes_{\text{Sets}_*} \mathbb{1}_{\text{Sets}_*} & & \\
 \downarrow [x] & & & &
 \end{array}$$

Diagram illustrating Step 1 of a proof, showing a commutative diagram involving objects S^0 , X , and $\mathbb{1}_{\text{Sets}_*}$ in the category Sets_* .

The diagram consists of several nodes and arrows:

- Top Row:**
 - $S^0 \wedge S^0 \xrightarrow{\text{id}_{\text{Sets}_*|S^0, S^0}^{\otimes, -1}} S^0 \otimes_{\text{Sets}_*} S^0 \xrightarrow{S^0 \text{id}_{S^0} \wedge \text{id}_{\mathbb{1}/\text{Sets}_*}^{\otimes, -1}}$
- Middle Row:**
 - $S^0 \xrightarrow{\rho_{S^0}^{\prime, -1}} S^0 \otimes_{\text{Sets}_*} \mathbb{1}_{\text{Sets}_*}$
- Bottom Row:**
 - $X \wedge S^0 \xrightarrow{\text{id}_{\text{Sets}_*|X, S^0}^{\otimes, -1}} X \otimes_{\text{Sets}_*} S^0 \xrightarrow{-\text{id}_X \wedge \text{id}_{\mathbb{1}/\text{Sets}_*}^{\otimes, -1}}$
- Left Column:**
 - $S^0 \xrightarrow{\rho_{S^0}^{\text{Sets}_*, -1}} S^0 \wedge S^0$
 - $S^0 \xrightarrow{[x]} X$
 - $X \xrightarrow{\rho_X^{\text{Sets}_*, -1}} X \wedge S^0$
- Right Column:**
 - $S^0 \otimes_{\text{Sets}_*} S^0 \xrightarrow{[x] \otimes_{\text{Sets}_*} \text{id}_{S^0}} X \otimes_{\text{Sets}_*} S^0$
 - $X \otimes_{\text{Sets}_*} S^0 \xrightarrow{-\text{id}_X \wedge \text{id}_{\mathbb{1}/\text{Sets}_*}^{\otimes, -1}}$
- Central Column:**
 - $S^0 \wedge S^0 \xrightarrow{[x] \wedge \text{id}_{S^0}} X \wedge S^0$
- Other Arrows:**
 - $S^0 \otimes_{\text{Sets}_*} \mathbb{1}_{\text{Sets}_*} \xrightarrow{[x] \wedge \text{id}_{\mathbb{1}/\text{Sets}_*}}$
 - $X \otimes_{\text{Sets}_*} \mathbb{1}_{\text{Sets}_*} \xrightarrow{\rho_X^{\prime, -1}}$
- Labels:**
 - (3) is associated with the arrow $S^0 \xrightarrow{[x]} X$.
 - (4) is associated with the arrow $S^0 \otimes_{\text{Sets}_*} \mathbb{1}_{\text{Sets}_*} \xrightarrow{[x] \wedge \text{id}_{\mathbb{1}/\text{Sets}_*}}$.
 - (5) is associated with the arrow $X \wedge S^0 \xrightarrow{\text{id}_{\text{Sets}_*|X, S^0}^{\otimes, -1}} X \otimes_{\text{Sets}_*} S^0$.