

Step 4

$$\begin{array}{ccccc}
 S^0 & \xrightarrow{\lambda_{S^0}^{\text{Sets}_*, -1}} & S^0 \wedge S^0 & \xrightarrow{\text{id}_{\text{Sets}_*|S^0, S^0}^{\otimes, -1}} & S^0 \otimes_{\text{Sets}_*} S^0 \\
 \downarrow [x] & & \downarrow \text{id}_{S^0} \wedge [x] & \text{(\text{3})} & \downarrow \text{id}_{S^0} \otimes_{\text{Sets}_*} [x] \\
 S^0 & \xrightarrow{\lambda_{S^0}^{\prime, -1}} & \mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} S^0 & & \downarrow \text{id}_{\mathbb{1}_{\text{Sets}_*}} \wedge [x] \\
 & & \text{(1)} & & \\
 & & \downarrow \text{id}_{S^0} \wedge [x] & \text{(5)} & \downarrow \text{id}_{S^0} \otimes_{\text{Sets}_*} [x] \\
 X & \xrightarrow{\lambda_X^{\text{Sets}_*, -1}} & S^0 \wedge X & \xrightarrow{\text{id}_{\text{Sets}_*|S^0, X}^{\otimes, -1}} & S^0 \otimes_{\text{Sets}_*} X \\
 & & \downarrow \lambda_X^{\text{Sets}_*, -1} & \text{(2)} & \downarrow \text{id}_{\mathbb{1}_{\text{Sets}_*}} \wedge [x] \\
 X & \xrightarrow{\lambda_X^{\prime, -1}} & \mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} X & &
 \end{array}$$

Diagram illustrating the commutativity of the square (5) in Step 4, showing the relationship between various maps and objects in the category Sets_* .

The diagram consists of several nodes and arrows:

- Top Row:** $S^0 \wedge S^0 \xrightarrow{\text{id}_{\text{Sets}_*|S^0, S^0}^{\otimes, -1}} S^0 \otimes_{\text{Sets}_*} S^0$
- Bottom Row:** $S^0 \wedge X \xrightarrow{\text{id}_{\text{Sets}_*|S^0, X}^{\otimes, -1}} S^0 \otimes_{\text{Sets}_*} X$
- Left Column:** $S^0 \xrightarrow{\lambda_{S^0}^{\text{Sets}_*, -1}} S^0 \wedge S^0$ and $X \xrightarrow{\lambda_X^{\text{Sets}_*, -1}} S^0 \wedge X$
- Right Column:** $S^0 \otimes_{\text{Sets}_*} S^0 \xrightarrow{\text{id}_{\mathbb{1}_{\text{Sets}_*}} \wedge [x]} \mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} S^0$ and $S^0 \otimes_{\text{Sets}_*} X \xrightarrow{\text{id}_{\mathbb{1}_{\text{Sets}_*}} \wedge [x]} \mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} X$
- Horizontal Maps:** $S^0 \xrightarrow{\lambda_{S^0}^{\prime, -1}} \mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} S^0$ and $X \xrightarrow{\lambda_X^{\prime, -1}} \mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} X$
- Vertical Maps:** $S^0 \wedge S^0 \xrightarrow{\text{id}_{S^0} \wedge [x]} S^0 \wedge X$ and $S^0 \otimes_{\text{Sets}_*} S^0 \xrightarrow{\text{id}_{S^0} \otimes_{\text{Sets}_*} [x]} S^0 \otimes_{\text{Sets}_*} X$
- Commutativity Labels:** (3), (4), (5), and (2) are placed near the corresponding squares.