

Step 4

$$\begin{array}{ccccc}
 & S^0 \wedge S^0 & \xrightarrow{\text{id}_{\text{Sets}_*|S^0, S^0}^{\otimes, -1}} & S^0 \otimes_{\text{Sets}_*} S^0 & \\
 \nearrow \lambda_{S^0}^{\text{Sets}_*, -1} & \downarrow & \text{(\text{3})} & \searrow \text{id}_{\mathbb{1}/\text{Sets}_*}^{\otimes, -1} \wedge \text{id}_{S^0} & \\
 S^0 & \xrightarrow{\lambda_{S^0}^{\prime, -1}} & \mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} S^0 & & \\
 \downarrow [x] & \downarrow \text{id}_{S^0} \wedge [x] & \text{(1)} & \downarrow \text{id}_{S^0} \otimes_{\text{Sets}_*} [x] & \\
 & S^0 \wedge X & \xrightarrow{\text{id}_{\text{Sets}_*|S^0, X}^{\otimes, -1}} & S^0 \otimes_{\text{Sets}_*} X & \\
 \nearrow \lambda_X^{\text{Sets}_*, -1} & \downarrow & \text{(2)} & \searrow \text{id}_{\mathbb{1}/\text{Sets}_*}^{\otimes, -1} \wedge \text{id}_X & \\
 X & \xrightarrow{\lambda_X^{\prime, -1}} & \mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} X & & \\
 & \downarrow \text{id}_{\mathbb{1}_{\text{Sets}_*}} \wedge [x] & \text{(4)} & & \\
 & & & &
 \end{array}$$

Diagram illustrating Step 4 of a proof, showing a commutative diagram with objects and morphisms in the category of sets.

The diagram consists of the following objects and morphisms:

- Objects:**
 - S^0 (top left)
 - $S^0 \wedge S^0$ (top middle)
 - $S^0 \otimes_{\text{Sets}_*} S^0$ (top right)
 - $\mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} S^0$ (middle right)
 - $S^0 \wedge X$ (bottom middle)
 - $S^0 \otimes_{\text{Sets}_*} X$ (bottom right)
 - $\mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} X$ (bottom right)
 - X (bottom left)
- Morphisms:**
 - $\lambda_{S^0}^{\text{Sets}_*, -1} : S^0 \rightarrow S^0 \wedge S^0$ (orange arrow)
 - $\text{id}_{\text{Sets}_*|S^0, S^0}^{\otimes, -1} : S^0 \wedge S^0 \rightarrow S^0 \otimes_{\text{Sets}_*} S^0$ (orange arrow)
 - $\text{id}_{\mathbb{1}/\text{Sets}_*}^{\otimes, -1} \wedge \text{id}_{S^0} : S^0 \otimes_{\text{Sets}_*} S^0 \rightarrow \mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} S^0$ (white arrow)
 - $\lambda_{S^0}^{\prime, -1} : S^0 \rightarrow \mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} S^0$ (white arrow)
 - $\text{id}_{S^0} \wedge [x] : S^0 \wedge S^0 \rightarrow S^0 \wedge X$ (white arrow)
 - $\text{id}_{S^0} \otimes_{\text{Sets}_*} [x] : S^0 \otimes_{\text{Sets}_*} S^0 \rightarrow S^0 \otimes_{\text{Sets}_*} X$ (orange arrow)
 - $\text{id}_{\text{Sets}_*|S^0, X}^{\otimes, -1} : S^0 \wedge X \rightarrow S^0 \otimes_{\text{Sets}_*} X$ (white arrow)
 - $\lambda_X^{\text{Sets}_*, -1} : X \rightarrow S^0 \wedge X$ (white arrow)
 - $\lambda_X^{\prime, -1} : X \rightarrow \mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} X$ (white arrow)
 - $\text{id}_{\mathbb{1}_{\text{Sets}_*}} \wedge [x] : \mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} S^0 \rightarrow \mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} X$ (white arrow)
 - $[x] : S^0 \rightarrow X$ (white arrow)
- Annotations:**
 - (3) is associated with the square involving S^0 , $S^0 \wedge S^0$, $\mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} S^0$, and X .
 - (4) is associated with the square involving $S^0 \otimes_{\text{Sets}_*} S^0$, $\mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} S^0$, $S^0 \otimes_{\text{Sets}_*} X$, and $\mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} X$.
 - (5) is associated with the square involving $S^0 \wedge S^0$, $S^0 \wedge X$, $S^0 \otimes_{\text{Sets}_*} S^0$, and $S^0 \otimes_{\text{Sets}_*} X$.
 - (2) is associated with the square involving $S^0 \wedge X$, $S^0 \otimes_{\text{Sets}_*} X$, X , and $\mathbb{1}_{\text{Sets}_*} \otimes_{\text{Sets}_*} X$.