

$$\begin{array}{ccc}
\mathcal{P}(A) \times \left( \mathcal{P}(B) \times \mathcal{P}(C) \right) & \xrightarrow{\alpha} & \left( \mathcal{P}(A) \times \mathcal{P}(B) \right) \times \mathcal{P}(C) \\
\downarrow 1 \times \varphi & & \downarrow \varphi \times 1 \\
\mathcal{P}(A) \times \mathcal{P}(B \times C) & & \mathcal{P}(A \times B) \times \mathcal{P}(C) \\
\downarrow \varphi & & \downarrow \varphi \\
\mathcal{P}\left(A \times \left(B \times C\right)\right) & \xrightarrow{\mathcal{P}(\alpha)} & \mathcal{P}\left(\left(A \times B\right) \times C\right)
\end{array}$$