$$
\begin{aligned}
&(\mathrm{as}_{X,Y,Z} \fatsemi \mathrm{br}_{X,Y\otimes Z} \fatsemi \mathrm{as}_{Y,Z,X})^{\star}(\langle x, y\rangle, z) \\
&= \bigcup_{\langle\langle y',z'\rangle,x'\rangle \in (\uparrow\{y\}\times\uparrow\{z\})\times\uparrow\{x\}} \mathrm{as}^{\star}_{Y,Z,X}(\langle y', z'\rangle, x') \\
&= \bigcup_{\langle\langle y',z'\rangle,x'\rangle \in (\uparrow\{y\}\times\uparrow\{z\})\times\uparrow\{x\}} \uparrow\{y'\} \times (\uparrow\{z'\} \times \uparrow\{x'\}) \\
&= \uparrow\{y\} \times (\uparrow\{z\} \times \uparrow\{x\}).
\end{aligned}
$$