

$$\begin{array}{ccccc}
((A_1 \otimes A_2) \otimes A_3) \otimes A_4 & \text{---} & \{\{1, 2\}, \{3\}, \{4\}\} & & \{1, 2, 3, 4\} \\
& & \downarrow & \nearrow & \parallel \\
& \downarrow & \{\{1, 2, 3\}, \{4\}\} & & \\
& & \uparrow & \searrow & \\
(A_1 \otimes (A_2 \otimes A_3)) \otimes A_4 & \text{---} & \{\{1\}, \{2, 3\}, \{4\}\} & & \{1, 2, 3, 4\} \\
& & \downarrow & \nearrow & \parallel \\
& \downarrow & \{\{1\}, \{2, 3\}, \{4\}\} & & \\
& & \uparrow & \searrow & \\
A_1 \otimes ((A_2 \otimes A_3) \otimes A_4) & \text{---} & \{\{1\}, \{2, 3, 4\}\} & & \{1, 2, 3, 4\} \\
& & \downarrow & \nearrow & \parallel \\
& \downarrow & \{\{1\}, \{2, 3, 4\}\} & & \\
& & \uparrow & \searrow & \\
A_1 \otimes (A_2 \otimes (A_3 \otimes A_4)) & \text{---} & \{\{1\}, \{2\}, \{3, 4\}\} & & \{1, 2, 3, 4\} \\
& & \downarrow & \nearrow & \parallel \\
& \uparrow & \{\{1\}, \{2\}, \{3, 4\}\} & & \\
& & \uparrow & \searrow & \\
(A_1 \otimes A_2) \otimes (A_3 \otimes A_4) & & \{\{1\}, \{2\}, \{3, 4\}\} & & \{1, 2, 3, 4\} \\
& \searrow & \equiv \downarrow & \nearrow & \\
& \parallel & \{\{1, 2\}, \{3, 4\}\} & & \parallel \\
& \nearrow & \equiv \uparrow & \searrow & \\
(A_1 \otimes A_2) \otimes (A_3 \otimes A_4) & & \{\{1, 2\}, \{3\}, \{4\}\} & & \{1, 2, 3, 4\} \\
& & \downarrow & \nearrow & \parallel \\
& \uparrow & \{\{1, 2\}, \{3\}, \{4\}\} & & \\
& & \uparrow & \searrow & \\
((A_1 \otimes A_2) \otimes A_3) \otimes A_4 & \text{---} & \{\{1, 2\}, \{3\}, \{4\}\} & & \{1, 2, 3, 4\}
\end{array}$$

[bottom line = top line]