$$\langle \langle \langle a, b \rangle, \langle c, d \rangle \rangle$$

$$(A \times B) \times (C \times D)$$

$$as_{A,B,C \times D}$$

$$(A \times B) \times C) \times D$$

$$as_{A,B,C \times D}$$

$$(A \times (B \times C) \times D)$$

$$(A \times (B \times C) \times D)$$