Remark 10.18. For $r \geq 3$, we define $(a_1, a_2, \ldots, a_{r-1}, a_r)$ and $[a_1, a_2, \ldots, a_{r-1}, a_r]$ inductively:

$$(a_1, a_2, \ldots, a_{r-1}, a_r) = ((a_1, a_2, \ldots, a_{r-1}), a_r);$$
$$[a_1, a_2, \ldots, a_{r-1}, a_r] = [[a_1, a_2, \ldots, a_{r-1}], a_r].$$

Exercise 10.19. Show that for $a, b, c \in \mathbb{N}$,

(1) $(a, [b, c]) = [(a, b), (a, c)]$;

(2) $[a, (b, c)] = ([a, b], [a, c])$;

(3) $([a, b], [a, c], [b, c]) = [(a, c), (a, b), (b, c)]$.