

478 Let a , b , and c be integer variables. Simplify
 $a := a + b. (b := a - b \parallel a := a - b)$

After trying the question, scroll down to the solution.

§ In the concurrent composition, b is a variable of the left process, and a is a variable of the right process. Let's give c to the left process.

$$\begin{aligned} & a := a + b. (b := a - b \parallel a := a - b) && \text{expand last two assignments} \\ = & a := a + b. (b' = a - b \wedge c' = c \parallel a' = a - b) && \text{replace } \parallel \\ = & a := a + b. (b' = a - b \wedge c' = c \wedge a' = a - b) && \text{substitution law} \\ = & b' = a + b - b \wedge c' = c \wedge a' = a + b - b && \text{simplify} \\ = & b' = a \wedge c' = c \wedge a' = a && \text{assignment} \\ = & b := a \end{aligned}$$