

- 501 According to the definition of assignment to an interactive variable, writing to the variable takes some time during which the value of the variable is unknown. But any variables in the expression being assigned are read instantaneously at the start of the assignment. Modify the definition of assignment to an interactive variable so that
- (a) writing takes place instantaneously at the end of the assignment.
 - (b) reading the variables in the expression being assigned takes the entire time of the assignment, just as writing does.

After trying the question, scroll down to the solution.

(a) writing takes place instantaneously at the end of the assignment.

§ Let a and b be the boundary variables, and let x and y be the interactive variables of the process in which this assignment appears.

$$x := e = a' = a \wedge b' = b \wedge (\forall t'' \cdot t \leq t'' < t' \Rightarrow x'' = x \wedge y'' = y) \wedge x' = e \wedge y' = y \\ \wedge t' = t + (\text{the time required to evaluate and store } e)$$

(b) reading the variables in the expression being assigned takes the entire time of the assignment, just as writing does.

§ I suppose it means that the value you read is the value of the variable sometime during the assignment, not necessarily the value at the start of the assignment. Let a and b be the boundary variables, and let x and y be the interactive variables of the process in which this assignment appears. Let z be an interactive variable from another process.

$$x := y + z = a' = a \wedge b' = b \wedge (\exists t'' \cdot t \leq t'' < t' \wedge x' = y + z'') \wedge (\forall t'' \cdot t \leq t'' \leq t' \Rightarrow y'' = y) \\ \wedge t' = t + (\text{the time required to evaluate and store } e)$$