Here are two different definitions of variable declaration with initialization.

\[
\text{var } x : T := e \cdot P = \exists x, x' : T : x = e \land P
\]

\[
\text{var } x : T := e \cdot P = \exists x' : T' : (\text{substitute } e \text{ for } x \text{ in } P)
\]

Show how they differ with an example.

\[
\$
\text{Let } e \text{ be } x \text{ and } P \text{ be } y' = x. \text{ Then}
\]
\[
\exists x, x' : x = e \land P
\]
\[
\Rightarrow \exists x, x' : x = x \land y' = x
\]
\[
\Rightarrow \exists x, x' : y' = x
\]
\[
\Rightarrow \top
\]

But

\[
\exists x' : (\text{substitute } e \text{ for } x \text{ in } P)
\]
\[
\Rightarrow \exists x' : (\text{substitute } x \text{ for } x \text{ in } y' = x)
\]
\[
\Rightarrow \exists x' : y' = x
\]
\[
\Rightarrow y' = x
\]

The one-point law

\[
\exists x : x = e \land P = (\text{substitute } e \text{ for } x \text{ in } P)
\]

applies only when \( e \) does not mention \( x \). So it does not apply in my example.