Here are two different definitions of variable declaration with initialization.

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

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

Show how they differ with an example.

§ Let \( e \) be \( x \) and \( P \) be \( y' = x \). Then

\[
\exists x, x': x = e \land P
\]

\[
\equiv \quad \exists x, x': x = x \land y' = x
\]

\[
\equiv \quad \exists x, x': y' = x
\]

\[
\equiv \quad \top
\]

But

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

\[
\equiv \quad \exists x': (\text{substitute } x \text{ for } x \text{ in } y' = x)
\]

\[
\equiv \quad \exists x': y' = x
\]

\[
\equiv \quad y' = x
\]