Extra Problem 1

For terms $t$ and $t^*$ and variable $x$, let $t^*(x; t)$ be the result of replacing the occurrences of $x$ in $t^*$ by occurrences of $t$.

Let $\mathfrak{A}$ be a model and let $s$ be a variable assignment. Let $x$ be a variable and let $t$ be a term. Let $s'$ be like $s$ except that $s'(x) = \text{den}_s^\mathfrak{A}(t)$. Prove by induction on length that, for all terms $t^*$,

$$\text{den}_s'(t^*) = \text{den}_s'(t^*(x; t)).$$