

$$\begin{aligned}
\mathbf{G} \varphi &\stackrel{\mathbf{n}}{=} \neg \mathbf{F} \neg \varphi \\
&\stackrel{\mathbf{n}}{=} \neg (true \mathbf{U} \neg \varphi) \\
&\stackrel{\mathbf{dsc}}{=} \neg (true \mathbf{U} (\neg \varphi \wedge sing)) \\
&\stackrel{\mathbf{t}}{=} \neg (true \mathbf{U} (\neg \boxed{\varphi} \wedge sing \wedge alive))
\end{aligned}$$