Let's work an example of §20.2(4), monads on a poset-considered-as-a-category, $\mathcal{X}$.

The existence of the monad's functor $T : \mathcal{X} \to \mathcal{X}$ assures us that $X \leq Y$ implies $TX \leq TY$; η_X that $X \leq TX$, and μ_X that $TTX \leq TX$.

It is important to note that because $Id_{\mathcal{X}}$ is always a monad (with suitable choices for η_X and μ_X), merely requiring that T be a monad on $\mathcal{X}$ is not enough to exclude the identity endofunctor. But let's reason directly and see what we get.

We can combine T and η_X to observe that $T(\eta_X) : TX \leq TTX$. Further combining μ_X, we see that $\forall X.TX \simeq TTX$: posets have at most one arrow from one object to another, so $TX \leq TTX$ and $TTX \leq TX$ must compose to $TX \leq TX$ and $TTX \leq TTX$, the identity arrows.

If X is maximal (i.e., $\nexists Y.X < Y$), then $\eta_X : X \leq TX$ implies that $TX = X$, as $\eta_X = id_X$ is the only choice.

Elsewhere, $X = TX = TTX$ is entirely acceptable ($\eta_X = \mu_X = id_X$), but not required.