Then by the sheaf property (ii), $\exists$ a section $s \in \mathcal{F}(U)$ s.t $s|W_p = s(p)|W_p$ for each $p \in U$.

It remains to prove that $\varphi(U)(s) = t$.
For each $p \in U$, $\varphi(U)(s)|W_p = t|W_p$. since

$$\varphi(U)(s)|W_p = \varphi_{W_p}(s(p)|_{W_p}) = t|_{W_p}$$

$\Rightarrow$ Again by the sheaf property (i) applied to $\varphi(U)(s) - t$,

$\varphi(U)(s) = t$.

Def: Let $\varphi : \mathcal{F} \longrightarrow \mathcal{G}$ be a morphism of presheaves. We define the ~~presheafs of~~ kernel of φ, presheaf cokernel of φ, and presheaf image of φ to be the presheaves given by $U \longmapsto \ker(\varphi(U))$, $U \longmapsto \operatorname{coker}(\varphi(U))$ and $U \longmapsto \operatorname{Im}(\varphi(U))$ respectively.

Note that if $\varphi : \mathcal{F} \longrightarrow \mathcal{G}$ is a morphism of sheaves, then the presheaf kernel of φ is a sheaf, but the presheaf cokernel and presheaf image of φ are in general not sheaves.
This leads us to the notion of a sheaf associated to a presheaf.

Proposition - Definition.

Given a presheaf $\mathcal{F}$, there is a sheaf $\mathcal{F}^+$, and a morphism $\theta : \mathcal{F} \longrightarrow \mathcal{F}^+$ with the property that for any sheaf $\mathcal{G}$, and any morphism $\varphi : \mathcal{F} \longrightarrow \mathcal{G}$, $\exists$ a unique morphism $\psi : \mathcal{F}^+ \longrightarrow \mathcal{G}$

s.t $\varphi = \psi \circ \theta$.