Algebraic geometry II: HW 6

No collaboration is allowed on the first problem. You may discuss the second problem with others, but you should write down the solution yourself.

1. Let $\phi : \mathcal{F} \to \mathcal{G}$ be a morphism of sheaves of abelian groups on a topological space X. Show that the presheaf that to an open subset U of X associates the group $\ker(\phi(U) : \mathcal{F}(U) \to \mathcal{G}(U))$ is a sheaf.

2. Show that if X is a topological space and U is an open subset, then the functor $\Gamma(U, \cdot)$ from the category of sheaves sheaves of abelian groups on X to the category of abelian groups (which takes a sheaf to the group of its sections over U) is left exact.