3. (a) Consider the category of sheaves on abelian groups $C = \mathrm{Sh}_{\mathrm{ab}}(X)$. C is obviously a preadditive category, since the composition of homomorphism $\mathcal{F}(U) \to \mathcal{G}(U)$, $\mathcal{G}(U) \to \mathcal{H}(U)$ for each $U \subset X$ has the structure of an abelian group, then so does $\mathrm{Hom}(A, B)$. $\underline{0}$, the constant sheaf with value at 0 is both a final and initial object in C. Given sheaves $\mathcal{F}, \mathcal{G}$ we can define the direct sum as $\mathcal{F} \oplus \mathcal{G} = \mathcal{F} \times \mathcal{G}$ with obvious projection and embedding morphisms, hence C is additive as well. Given some morphism of sheaves in C, $f : \mathcal{F} \to \mathcal{G}$ define subsheaf $\mathrm{Ker}(f)$ as

$$\mathrm{Ker}(f)(U) = \{s \in \mathcal{F} \mid f(s) = 0 \in \mathcal{G}(U)\}$$

which is a kernel in C. Similarly, consider the pre-sheaf on abelian groups $\mathcal{H}(f)$ by $\mathcal{H}(U) = \mathcal{G}(U)/f(\mathcal{F}(U))$, sheafify to $\mathrm{Coker}(f) := \overline{\mathcal{H}}$. Since for $p \in X$, $\mathrm{Coker}(f)_p = \mathrm{Coker}(f_p)$ then the map $\mathcal{G} \to \mathrm{Coker}(f)$ is an epimorphism and if $g : \mathcal{G} \to \mathcal{K}$ is a C-morphism such that $g \circ f$ vanishes then g induces a morphism between $\mathcal{G}(U)/f(\mathcal{F}(U))$ to $\mathcal{K}(U)$ for all $U \subset X$ open. By universal property we get $\mathrm{Coker}(f) \to \mathcal{K}$ which is then unique by surjectivity above. Hence it is a coker.

Since C is an abelian category, all limits and colimits exist in general.

(b) Let $f : \mathcal{F} \to \mathcal{G}$ be a morphism of sheaves on abelian groups.
Assume first that $f_p : \mathcal{F}_p \to \mathcal{G}_p$ is surjective for all $p \in X$, then if $g_1, g_2 : \mathcal{G} \rightrightarrows \mathcal{H}$ (where H is another sheaf) such that $g_1 \circ f = g_2 \circ f$, this also becomes equal on stalks. Since f_p is surjective, it is an epimorphism in **Ab** thus $(g_1)_p = (g_2)_p$ and since the maps are equal on stalks they are equal on the sheaf so $g_1 = g_2$.
Conversely, assume f is an epimorphism and pick $p \in X$. Define a sheaf $\mathcal{H}$ as follows: if $p \in U \subset X$, then $\mathcal{H}(U) = \mathrm{coker}(f_p)$, and $\mathcal{H}(U)$ vanishes when $x \notin U$. Restriction maps are either the identity if both sets contain p and the zero map otherwise. Then define $g : \mathcal{G} \to \mathcal{H}$, sending $\mathcal{G}(U)$ to $\mathcal{H}(U)$ by $s \mapsto [s]$ if $x \in U$ and $s \mapsto 0$ otherwise. Further define $g_1, g_2 : \mathcal{G} \rightrightarrows \mathcal{H} \oplus \mathcal{H}$ as $g_1 = (g, 0)$, $g_2 = (0, g)$. Now if $f_p : \mathcal{F}_p \to \mathcal{G}_p$ is not surjective then $\mathcal{H}$ is non-trivial so $g_1 \neq g_2$. However $g_1 \circ f = g_2 \circ f$ so this can not be the case. Hence f_p must be surjective.

(c) Define $\mathcal{F} := i_{-,*}\underline{\mathbb{Z}} \oplus i_{+,*}\underline{\mathbb{Z}}$, $\mathcal{G} := i_*\underline{\mathbb{Z}}$