Exercises:

1. Sketch Δ_n for $n = 1, 2, 3$. Show that Δ_n is a compact and connected subspace of $\mathbb{R}^{n+1}$.
2. Discuss the continuity of the maps (29.1). Prove lemma (29.1). what about the cases $i \leq j$?
3. Verify equation (29.8).
4. Determine the values of n ($n = 1, 2, \dots$) for which a constant function $\Delta_n \longrightarrow X$ an $n-$cycle.
5. Show that the family of all chain complexes forms a category in which the set of morphisms Mor (G, K) between any two chain complexes G and K is the set of all chain maps from G to K.
6. Naturality of (29.17)-(29.18). Assume given a commutative diagram of chain complexes with exact rows:

$$\begin{array}{ccccccccc} 0 & \longrightarrow & L & \xrightarrow{f} & G & \xrightarrow{g} & K & \longrightarrow & 0 \\ & & \downarrow{\phi} & & \downarrow{\psi} & & \downarrow{\eta} & & \\ 0 & \longrightarrow & L' & \xrightarrow{f'} & G' & \xrightarrow{g'} & K' & \longrightarrow & 0 \end{array}$$

Denoting by δ_n and δ'_n the connecting homomorphisms, sketch relevant diagrams and prove that

$$\delta'_n \circ H_n(\eta) = H_n(\psi) \circ \delta_n$$