Simplicial Complexes

Sheet 7

(1) Let $G = \langle a, b \rangle$ be the free group with two generators. Find a graph whose associated simplicial complex is isomorphic to the poset of cosets $\Delta(G, \{a, b\})$. Make a drawing.

(2) Let $G = \langle a, b, c \mid a^2 = b^2 = c^2 = e \rangle$ be the free group with two generators. Find a graph whose associated simplicial complex is isomorphic to the poset of cosets $\Delta(G, \{a, b, c\})$. Make a drawing.

(3) Let K, V and X' as in Corollary 1.12 with $n := \dim V \geq 2$.

   (a) Show that $\Delta(X', \subseteq)$ is not a Coxeter complex.

   (b) Give an example of a chamber subcomplex of $\Delta(X', \subseteq)$ that is isomorphic to A_{n-1} and therefore a Coxeter complex. (Hint: Consider a basis of V).