

Seminar 3

(S3.1) Let us consider the cube $C_3 = \{x \in \mathbb{R}^3 \mid 0 \leq x_i \leq 1 \text{ for all } i = 1, 2, 3\}$ in \mathbb{R}^3 . List the faces, the facets, the minimal faces and the vertices of C_3 .

(S3.2)

- (i) If P is an affine set, then its only faces are \emptyset and P .
- (ii) If P has proper faces, then $I^+ \neq \emptyset$.
- (iii) If F is a proper face of P , then $F = \{x \in P \mid A_I x = b_I\}$ for some $\emptyset \neq I \subseteq I^+$.