1. Convex sets:

$$[x, y] = \{tx + (1-t)y \mid 0 \le t \le 1\}.$$

$$S \text{ in convex if } x, y \in S \Rightarrow [x, y] \subseteq S.$$

2. Simplex method: begin with. $\underline{\text{basic feasible solutions.}}$

3. two-phase simplex method:

$$Ax \le b \Rightarrow A(x + x^s) = b.$$
$\longrightarrow$ slack variables.

$$Ax = b \Rightarrow A(x + x^a) = b$$
$\longrightarrow$ artificial variables.