A GENERALIZATION OF CONVEXITY

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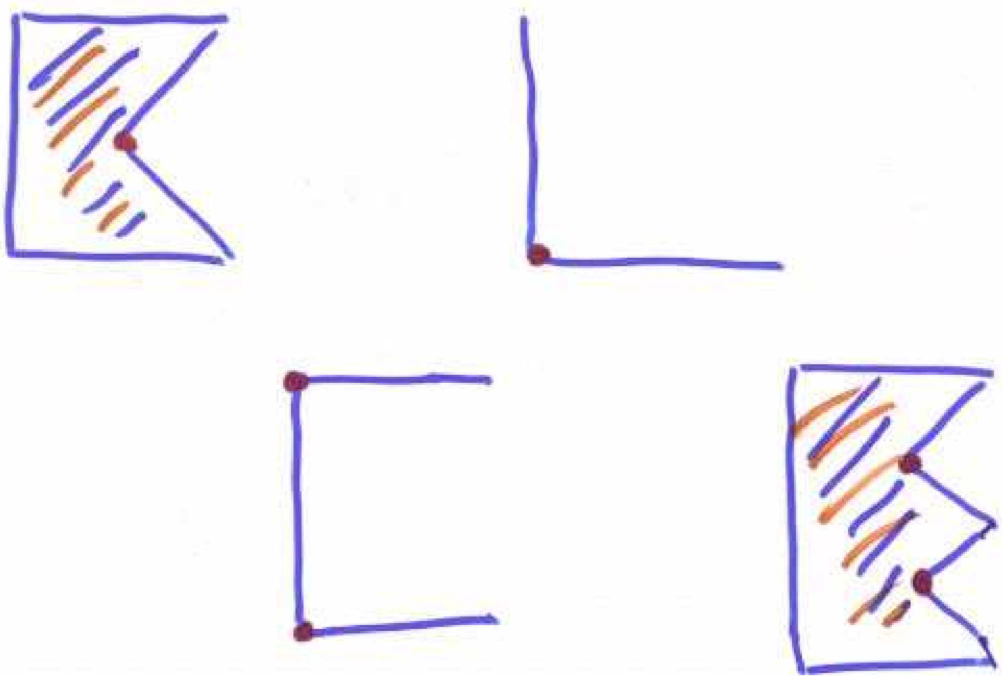
A set $S \subseteq \mathbb{R}^d$ is said to be m-convex if for any set of m points $\{x_1, x_2, \ldots, x_m\}$ in S there exists $i, j \in \hat{m} \ni \overline{x_i x_j} \subseteq S$



 . . . Exactly (7, 3)-convex

$n > \binom{m-1}{2} \Rightarrow S'$ is connected

Helly order of (m,n)-convex sets in $\mathbb{R}^d$, with $n > \binom{m-1}{2}$ is 4.

Other Helley orders?

(m,n)-convex graphs?

A $^{\text{closed}}$ 3-convex set in $\mathbb{R}^2$ is the union of 3 or fewer convex sets (w/ non-empty intersection), has an odd number of points of local non convexity (lnc pts), and is starshaped w.r.t. its lnc points.

A set $S \subseteq \mathbb{R}^d$ is said to be (m,n)-convex if for any set of m points in S n of the $\binom{m}{2}$ segments determined by the m points lie in S