Drawing Rotations

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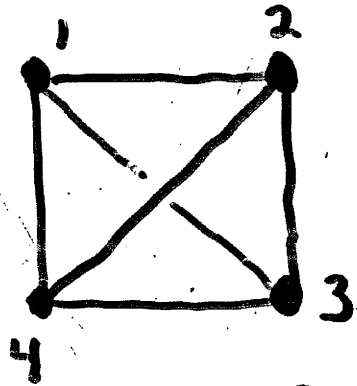


K_4 in $\mathbb{R}^2$

G

cyclic permutation of neighbors @ a vertex is called a local rotation

Collection of local rotations for each vertex is a rotation (scheme)

1: (432)
2: (431)
3: (421)
4: (321)

Drawing avoids

a)  (self-crossing)

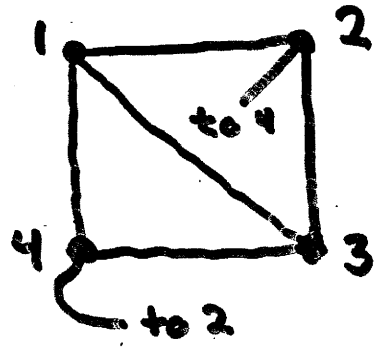
b)  (multiple-crossing)

c)  (adjacent-crossing)

Lemma: Drawing $\Rightarrow$ Rotation

Question: Which rotations correspond to drawings

Example



1: (432)
2: (431)
3: (421)
4: (123)

G

Bad

Motivation: From drawing of K_n get rotation, & from rotation can count # crossings in drawing

Knowing which rotations come from drawings might help get lower bound on $cr(K_n)$

Might even be possible min "#bad K_4" is conjectured lower bound for $cr(K_n)$ where min is over all rotations & bad K_4 is drawable crossing or non drawable K_4