1. Write down the elements of Q_5 in simplicial order.

2. Let $A \subset [9]^{(3)}$ with $|A| = 28$. How small can the lower shadow of A be? And the upper shadow?

3. Let $A \subset Q_6$ with $|A| = 26$. How small can the vertex-boundary of A be?

4. The *diameter* of a set $A \subset Q_n$ is $\max \{d(x,y) : x, y \in A\}$. Deduce from Harper's theorem that if $A \subset Q_n$ has diameter d, where $d < n$ and d is even, then $|A| \le \left| X^{(\le d/2)} \right|$.

5. Find a set system $A \subset X^{(r)}$ (for some n and r) for which equality holds in the Kruskal-Katona theorem but which is not isomorphic to an initial segment of colex.

$^+$6. Let $A \subset X^{(r)}$ and $B \subset X^{(r+1)}$ be initial segments of colex with $|A| = |B|$. Do we always have $|\partial A| \le |\partial B|$?