Research Notes - Hypergraph Automorphisms

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Theorem. *Let H be a hypergraph and Γ a subset of Aut(H) that acts transitively on $V(H)$, $E(H)$. If $|e \cap e^g| \geq c \forall e \in E(H), g \in \Gamma$ then the size of each edge is at least $\sqrt{c|V\ vert}$*

Proof. Count pairs (g, x) with $g \in Gamma$, $x \in V$, $x \in e^g \cap e$. There are at least $|\Gamma|c$ of them. Also, there are $k^2|\Gamma_x|$ of them, where k is the size of each edge. Thus, we see that $k^2 \geq |v|c$. □