1037-05-211   **Sang-il Oum*** (`sangil@kaist.edu`), Dept. of Mathematical Sciences, KAIST, 335 Gwahangno Yuseong-gu, Daejeon, 305-701, South Korea. *Chain theorems for 4-prime graphs.*

A graph G is 4-*prime up to separators of size* k if $\min(|X|, |V(G) \setminus X|) \leq k$ whenever the cut-rank of X in G is at most 2. A graph is *internally 4-prime* if it is 4-prime up to separators of size 3. We prove several chain theorems for 4-prime graphs, such as the following: for a prime and internally 4-prime graph G, there is a pivot-minor H of G such that $|V(H)| = |V(G)| - 1$ and H is 4-prime up to separators of size 5. By using these chain theorems, we show that pivot-minor-minimal graphs of rank-width at most 3 have at most 16 vertices. (Received February 03, 2008)

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