

MA 614 – Homework 29
Due Friday, April 29

Your answers should be detailed explanations in quality mathematical English. You must type your homework in LaTeX.

1. Prove that for a finite, graded poset P with rank function $\rho : P \rightarrow \{0, 1, \dots, n\}$, $\beta_P(S) = 0$ if $S \not\subseteq \{1, 2, \dots, n-1\}$, i.e. if 0 or n is in S .
2. Let P be a p -element poset, and let $S \subseteq [p-1]$ satisfy $\beta_{J(P)}(S) \neq 0$. Show that if $T \subseteq S$, then $\beta_{J(P)}(T) \neq 0$.
3. Let p be a positive integer and let $S \subseteq [p-1]$. What is the least number of linear extensions a p -element poset P can have if $\beta_{J(P)}(S) > 0$?