

Math 4550 Hints for questions for March 3, 2009

1. Let F be a face of dimension $d - 2$. By the proof of the \mathcal{H} -polytopes equal \mathcal{V} -polytopes F is contained in the intersection of some number of facets. Show that the collection of all hyperplanes which contain F is parameterized by a circle and use this to derive a contradiction if F is contained in less than two or more than two facets.
2. Use #4 on the questions for Feb. 3 to determine $f_{-1}, f_0, \dots, f_{\lfloor d/2 \rfloor}$. Now use Stanley's trick...
3. Use #1 on the question for Feb. 3 to determine h_i for $d = 2, 3, 4, 5$. The pattern should be clear.
4. Let F_1, \dots, F_t be a line shelling of ∂P . Determine the Euler characteristic of $\bigcup_{i=1}^k F_i$ inductively. Then put in P .