Math 4550 HW5 due March 3, 2011

1. Does there exist a shellable polytope whose $f$-vector is (1, 7, 19, 20, 8)?

2. For this problem you may assume that faces of $\Delta^d, \square^d, \diamond^d$ have the form determined from question set 2, problem 5.

   (a) Compute the $f$-vector for $\Delta^d, \square^d$ and $\diamond^d, d \geq 1$

   (b) Compute

   $$\sum_{i=-1}^{d} (-1)^i f_i$$

   for $\Delta^d, \square^d$ and $\diamond^d, d \geq 1$.

3. Exercise 3.5 number 2 of the ‘text’.