

**Spring 2019, Math 596: Preliminary Problem Set 13**  
**Due: Thursday, May 2nd, 2019**  
**Hilbert Series of Numerical Semigroups**

**Preliminary problems.** These problems should be completed before discussion on Thursday.

(P1) List all faces of the simplicial complex with facets

$$\{123, 124, 134\}.$$

(P2) Let  $S = \langle 3, 5 \rangle$ . Find  $Q(z)$ , where

$$\mathcal{H}(S; z) = \sum_{n \in S} z^n = \frac{Q(z)}{1 - z}.$$