

## Homework 2, Due Tuesday, 04/13

1. Consider the two-dimensional toric variety  $X_\Sigma$  where the fan  $\Sigma$  consists of the four quadrants and all their faces (9 cones total).
  - a) Describe  $X_\Sigma$ .
  - b) Find the Picard group of  $X_\Sigma$ .
2. Construct a toric variety that is Gorenstein but not  $\mathbb{Q}$ -factorial.