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Final

Problems

Problem 1: Give the data and steps in defining a toric variety from a fan.

Problem 2: Give the fans of $\mathbb{P}^n$ and the twisted projective space $\mathbb{P}^n(d_0, \dots, d_n)$. Draw the fans of $\mathbb{P}^1$, $\mathbb{P}^2$, $\mathbb{C}^2$, $\mathbb{C}^{*2}$ and $\mathbb{P}^2(1,2,2)$.

Problem 3: Given Δ a fan in N and Δ' a fan in N'. What is the condition for a map $N \to N'$ to induce a map $X(\Delta) \to X(\Delta')$

Problem 4: Give criteria for a toric variety to be a) complete/compact, b) non-singular.

Problem 5: Give the toric picture of the blow up of $\mathbb{C}^2$ at the origin.

Problem 6: Give an example of a toric flop.

Problem 7: Give a formula cohomology ring of a simplicial and a smooth toric variety. Be careful in the choice of coefficients.

Problem 8: What is the Euler characteristic of a toric variety given by a fan.

Problem 9: How are polytopes and toric varieties related?