Problem 1. The toric variety $V = V(xy - zw) \subset \mathbb{C}^4$.

Consider the affine variety that is defined by the polynomial $f(x, y, z, w) := xy - zw$.

i) Identify a 3-dimensional algebraic torus as subset of V.

ii) Which Laurent monomials extend to functions of V? Describe the lattice points $(a, b, c) \in \mathbb{Z}^3$ such that a Laurent monomial $t_1^a \cdot t_2^b \cdot t_3^c$ extends to a function on V.

iii) Describe the cone $C \subset \mathbb{R}^3$ that contains the exponents of the Laurent mononials that extend to V in terms of primitive $\mathbb{Z}^3$-vectors that generate C.