Exercise 15: Integer Lattices (4 Points)
Prove: If $C \subseteq \mathbb{R}^d$ is convex, symmetric around the origin, bounded, and such that $\text{vol}(C) > k \cdot 2^d$, then $C$ contains at least $2k$ lattice points.

Exercise 16: Determinant and Volume of Parallelepiped (4 points)
Let $v_1, \ldots, v_d$ be linearly independent vectors in $\mathbb{R}^d$. Form a matrix $A$ with $v_1, \ldots, v_d$ as rows. Prove that $|\text{det}A|$ is equal to the volume of the parallelepiped $\{\alpha_1 v_1 + \alpha_2 v_2 + \cdots + \alpha_d v_d \mid \alpha_1, \cdots, \alpha_d \in [0,1]\}$. 