Theoretical task 6.

Recommendations: all solutions should be short, mathematically strict (unless qualitative explanation is needed), precise with respect to the stated question and clearly written. Solutions may be submitted in any readable format, including images.
Submission link: here

1. Consider a linearly separable dataset and SVM with polynomial kernel $K(x, y) = (x^\top y + 1)^d$. Is that right, that for any $d > 1$ the decision boundary representation in initial feature space will be the **error-free hyperplane** (linear decision boundary).

2. Find the computational complexity of the linear and kernel SVM **classification** procedure of a single object (SVM is already trained).

3. Consider SVM regression optimization problem. Write down dual formulation of that problem with Lagrangian and Karush-Kuhn-Takker theorem.