

Coursework (2) for *Introductory Lectures on Optimization*

Your name

Your ID

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Exercise 1. For the function $f(x) : \mathbb{R}^n \rightarrow \mathbb{R}^m$, please write down the zeroth-order Taylor expansion with an integral remainder term.

Solution of Exercise 1: bla.bla... bla bla.. bla. □

Exercise 2. Please write down the definition of the p -norm for a n -dimensional real vector.

Solution of Exercise 2: bla.bla... bla bla.. bla. □

Exercise 3. Please write down the definition of the matrix norms induced by vector p -norms.

Solution of Exercise 3: bla.bla... bla bla.. bla. □

Exercise 4. Let A be an $n \times n$ symmetric matrix. Proof that A is positive semidefinite if and only if all eigenvalues of A are nonnegative. Moreover, A is positive definite if and only if all eigenvalues of A are positive.

Proof of Exercise 4: bla.bla... bla bla.. bla. □