1 Repetition

1. What is the definition of *injective*, *surjective* and *bijective*?
2. Let $A \in \mathbb{F}^{n \times n}$ be a matrix. How is invertibility of a matrix defined?
3. What does the theorem about the $LU-$decomposition of a matrix say?
4. Why is it better to solve the system $Ax = b$ instead of computing A^{-1} and then $A^{-1}b$?
5. What is the definition of a norm?
6. How is positive definiteness of a matrix $A \in \mathbb{R}^{n \times n}$ defined?
7. Give a definition of an Eigenvalue of $A \in \mathbb{F}^{n \times n}$.
8. How does the eigendecomposition of a symmetric matrix look like?
9. What is the normal equation?
10. What is the singular value decomposition?

Solution: