Linear Algebra - Check your knowledge

□ Are you comfortable with the following matrix manipulations?

- Addition, subtraction, and multiplication of matrices, including multiplication of a matrix by a vector;
- Multiplication of a matrix by a scalar;
- Transposition of matrices.

□ Do you know the definition of linear independence of a set of vectors?

□ Do you know what a vector space is? Do you know how to decide whether a subset of a given vector space is a subspace (i.e. is itself a vector space)?

□ Do you know what the span of a set of vectors is?

□ Do you know what a basis is? Given a set of vectors, do you know how to decide whether the vectors in the set form a basis of a given vector space?

□ Do you know how to find the dimension of a vector space? In particular, do you know how to find the dimensions of the column space, of the row space, and of the null space of a matrix?

□ How is the rank of a matrix defined?

□ Do you know what the rank theorem says?

□ What is a linear system of equations?

□ Do you know how to decide whether a linear system of equations is consistent?

□ If a system is consistent, how do you know whether it has just one or an infinite number of solutions?

□ What does it mean for a linear system of equations to be homogeneous? What is the form of the general solution to a non-homogeneous linear system of equations?