

## Preparation guide for Quiz 05

The exam problems will be closely related to your homework problems. Make sure you understand all of them.

1. Prerequisite:

Review basic formula for numerical differentiation and integration. The rest of the semester is focused on solving linear systems. These formula will be used frequently in constructing linear systems.

2. Section 4.9:

Study the reason of loss of accuracy for improper integrals. Study how to predict and how to verify numerically the reduced order of convergence and the cure to restore theoretical order of convergence.

3. Section 6.1:

Study how to count the number of operations to leading order efficiently both for Gaussian elimination and backward substitution. Do this both for full matrices and sparse matrices such as those in Homework 13.

4. Section 6.1:

Practice programming for Gaussian elimination (without pivoting) and backward substitution.

5. Section 6.2:

Study how to perform partial pivoting and scaled pivoting manually for small matrices.

6. Section 6.5:

Study how to perform  $LU$  decomposition with or without pivoting manually for small matrices.

7. Section 6.5: Study how  $LU$  decomposition can be used to evaluate the determinant of a matrix.