

## Review of lectures 15 to 28 on Maple

The exam is open book, open notes and open computer. To prepare for the exam you must organize your course materials to be ready for fast consultation. The worksheets of the lectures will still be available on the web for browsing; however, there is no guarantee the network or the computers at the math department will function properly. A diligent student has a backup on a zip disk and/or on paper.

Typically, on an open book exam, you use the course materials for consultation (e.g., to seek confirmation for your methods), not for study. If you have no clue how to start on a problem, you will run out of time if you start scanning all course materials looking for some hint.

The questions below are just samples of the type of questions you may expect. Also review the homework assignments and quizzes. The experience gained in the project may also help you.

### 1. Explain, give definition or difference between, illustrate...

This type of questions tests your understanding of Maple and symbolic computation in general.

1. Explain why it is better to use `piecewise` than an ordinary `if-then-else` to implement a procedure.
2. Explain the differences between a list and a set.
3. What is the difference between `Diff` and `D`? Illustrate the difference with an example.
4. What is a remember table. Why is it needed? Give an example.
5. What is last name evaluation? Illustrate.
6. Give a good example of the use of an anonymous function.
7. Sometimes Maple displays `_B1`, `_Z1`, or even `_C1` in its output. What does this mean? Give an example of a Maple command which shows one of these symbols in the output.

### 2. Give Maple command(s) to...

This type of question tests your operational understanding of Maple. In many cases, there is only one main command. Most quizzes start with a question like this.

### 3. Some more elaborate problems

Almost every lecture has some assignments which need to be solved in several stages. The list below features the most typical ones.

1. (Assignment 16.4.2)  
Write an indexed procedure to implement a recursive formula. Make sure the formula can be evaluated for high values of the recursion parameter.
2. (Assignment 19.7.2)  
Work with functions defined by integrals.
3. (Assignments 20.5.2 and 20.5.3)  
Taylor expansions of generating functions define functions.
4. (Assignments 21.4.1 and 21.4.2)  
Manipulations of sequences and lists.

5. (Assignment 22.6.4)  
Write an extension to convert.
6. (Assignments 23.3.5 and 23.3.6)  
Use the method of Lagrange multipliers to solve a problem in constrained optimization.
7. (Assignment 24.6.2)  
Convert from rectangular to polar coordinates to obtain a nice plot of an algebraic curve.
8. (Assignment 26.6.1)  
Given a polynomial in one variable and with one parameter, besides the “generic” solutions, find the special values
9. (Assignment 26.6.3)  
Find all common intersection points to two algebraic curves using the method of Gröbner bases. for the parameter for which there are fewer or more roots.
10. (Assignment 28.6.2)  
The connection between roots of polynomials and linear algebra.

**Please note the policy on skipping exams:** If an exam is missed, then greater weight will be placed on the final exam, especially on the material covered on the missing exam. What this means is that if you decide not to take one midterm exam, your final exam will be weighted for one hundred points more. What it does NOT mean is that you can drop the score of a midterm exam. If you take the midterm, then your score counts. So, please be prepared when you show up for the exam.