MATH 211 MAPLETIPS

This assignment can be done in MS 571, 515, 521. If a class is taking place in one of these rooms, you can ask the instructor for permission to use a free computer. To start, first hold down Control-Alt-Del, click mouse on Username and type in your usual U of C username, then click (do not use Enter button here) on Password and type that in, click Login, then doubleclick on the Maple 12 icon. Then click Close or $\times$ on the Startup window. Notice the Quickhelp screen available, you can remove it by clicking on the $\otimes$, or bring it back any time with F1. From the menu select [> to do maths, you can also select T to type ordinary symbols (such as your name). Each mathematical command starts with a cursor that looks like >, and finish each command with " Enter." Detailed instructions for completing the assignment are given below. Don't forget to logout when done. The printouts go to the Elbow Room in Science Theatres. If you wish you can do part of the assignment, then use the "Save As" command, give it a name, logout and return to it later. Thanks to both Dana Kinnaird and Igor Djorganoski for their help in the preparation of these MAPLEtips.

INSTRUCTIONS

Your assignment should be turned in from the computer print-out and stapled. Unstapled assignments not accepted. Number each question clearly. Your name (or any other text) can be typed in by clicking the Maple Menu at top on "T", typing in whatever is needed, and then "Enter". To go back to the Maths Mode click the Menu on " [>".

Remember that each maths command ends with a "Return", these will not be indicated below after 2(a). The specific commands for each problem follow. A couple of useful hints are first given. The basic arithmetical operations in Maple are $+ \quad - \quad * \quad / \quad \wedge$. Be very careful about parentheses, there must always be as many left parentheses as right parentheses. The multiplication symbol can be omitted, as one usually does in writing something like $2x$, but notice that to write 3×5 you will have to type in $3 * 5$. Also use the arrow keys on the keyboard to move the cursor to where you want it, especially the $\rightarrow$ to bring the cursor back to the main line such as after typing an exponent. The command % is a short-hand for the previous line's output. The exponential function e^x is typed $\exp(x)$. For some of the questions it's convenient to first define a function or symbol. See Question 3 below for an example of this.

1. Enter your name on first page, and your ID number on p.2 (can be typed or written by hand).

2. (a)>evalf(exp(1),100) Enter >evalf(Pi,100) Enter (afterwards the "Enter" after each command will not be written).

   (b) just type in or write your answer here, but think carefully first - otherwise the chances are 99% you will get the wrong answer! Also, a short explanation of your answer must be given to obtain credit for (b).

   Tip to save paper on your printout - ending a command with a colon (:) will cause MAPLE to do the command but it will not show up on the screen or on the printout. A couple of commands below will end with a colon, however it is recommended you do it first without the colon and look at the output, then go back and put in the colon at the end of the command so it no longer shows up on the printout.

3. >p := x∧3 - 7x∧2 + 5x - 12 (remember in typing to use the $\rightarrow$ where needed, i.e. after each exponent).

   >solve(p=0,x):

   >evalf(%,30)

   To do the rest of the assignment the linear algebra package will be needed.

>with(linalg):

Now type in each of the three matrices. For example

>C:= Matrix([[2,3,4],[3,5,0],[4,0,-2]])

Be sure to not forget any comma or parentheses or brackets.

4. For this question no work on MAPLE is necessary, just a written answer should be given.

5. (a) >rank(A)

   (b) >gaussjord(A) Don't forget the second half of the question

6. >multiply(B,A)

7. (a) >det(B)

   (b) Written answer.

   (c) >inverse(B)

   (d) Written answer.

8. Use commands >eigennvalues(B), >eigenvectors(B)

9. (a) >eigenvalues(C): then >evalf(%,30)

   (b) Written answer

10. You should be able to do this one now easily on your own. To save paper you need only print $S^2,\ S^4,\ S^{800}$.

11. This should also be easy now, but be careful not to call this matrix A, since A is already stored in your worksheet as a different matrix. You can either unassign A, or simply call the new matrix E. To help answer the question you may want to do >evalf(%) after you take each power of the matrix.

To print just go to File and click on Print, similarly to exit go to File and click on Exit. It will ask you if you wish to save your work, generally the answer is No, but if you wish to continue the session later just use the Save As command as usual to create a file. Don't forget to logout when session is finished. Bon chance, boa sorte, viel Glück, good luck!