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COMPUTER ALGEBRA SYSTEMS

Computer Algebra Systems or Symbolic Mathematics Software Packages have been developed over the past 25 years. The best known packages are **MACSYMA, MAPLE, MATHEMATICA, MATHCAD, MATHSCRIBE, MuMATH**, and **DERIVE, REDUCE, SMP**. These packages will be denoted by **MATHPROG** in this brief overview.

MATHPROG tie together many disparate mathematical capabilities in one package. **MATHPROG** is at once a computer algebra system, a collection of numerical routines, and a mathematical graphics package. All the mathematics are accessed by a single command language and programming language, and the entire user interaction takes place in a uniform graphical environment.

MATHPROG can be used to do analytical work, to manipulate algebraic expressions, to differentiate and integrate, solve linear and nonlinear ordinary differential equations analytically or numerically, display results graphically, and much more. For example **MATHPROG** such as **MACSYMA, MAPLE, MATHEMATICA, MATHCAD, MATLAB** as well as Spread Sheets such as **EXCEL** support special functions such as Airy, Bessel, error, complementary error, beta and gamma, Legendre, complete and incomplete elliptic integrals, and others. These are very important when dealing with solutions to ordinary and partial differential equations.

MATHPROG can be used to write procedural programs such as **BASIC, FORTRAN, PASCAL**, etc to perform specific tasks. When used properly **MATHPROG** can be a powerful tool to increase ones productivity and to enable one to address new problems.

MAPLE V release 4 is a recently developed system written in **C** (in order to achieve greater portablilty and speed). **MAPLE** runs on a large range of machines. It is available from Waterloo Maple Software, 450 Philip Street, Waterloo, Ontario, N2L 5JL, email: info@maplesoft.com.

MAPLE V release 4 is available through **WATSTAR**.