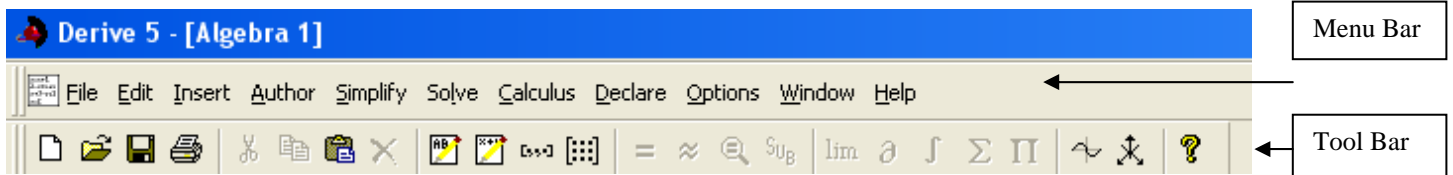





DERIVE is a Math program used to simplify, solve and plot mathematical expressions.

STARTING THE PROGRAM

1. Double click on the **Student Applications** folder.
2. Double click on the **ALC Applications** folder.
3. Double click on the **Math** folder.
4. Double click on **DERIVE 5** folder and then double click on the icon.
Click **NO** when the **Derive Startup** dialog box is displayed.



AUTHORING AN EXPRESSION

Click on **Author** from the Menu Bar and then click on **Expression** or click on the **Pencil** icon  found on the Tool Bar. The cursor is positioned in Author Expression box. Type in your equation. Press Enter when you are done typing the expression.



When you are entering an expression, most math symbols are found on the Author Expression tool bar. If you need to use a symbol, which is not shown, click on function key **F1** to display Derive Help for "Entering Mathematical Expressions."

ENTERING AN EXPRESSION

To enter **Math operators**:

MATH OPERATORS	METHOD TO ENTER
Addition	Hold down the shift key and press the + key
Subtraction or Negation	Type -
Multiplication	Hold down the shift key and press the 8 key to type *
Division	Type /

ENTERING AN EXPRESSION continued

To enter **Relational operators**:

RELATIONAL OPERATORS	METHOD TO ENTER
Equal Operator	Type =
Not Equal Operator	Type /=
Less Than Operator	Type <
Less Than or Equal Operator	Type <=
Greater Than Operator	Type >
Greater Than or Equal Operator	Type >=

To enter an **Exponent**:

Hold down the shift key and press the number 6 key to type \wedge . Example: 3^2 is entered as $3\wedge 2$

To enter **Mathematical symbols**: Find the Math symbol on the Author Expression toolbar and click on it or use the Ctrl Key method outlined below.


Math Symbol	Name	Description	Ctrl Key Method
π	pi	area of the unit circle (3.14159...)	Ctrl+P
e	Natural logarithms	base of the natural logarithms (2.71828...)	Ctrl+E
i	Imaginary unit	imaginary unit (square root of -1)	Ctrl+i
$^\circ$	degree	number of radians per degree	Ctrl+O (Letter O)
∞	infinity	Positive infinity	Ctrl+0 (Number 0)
\cup	union	union operator for sets	Ctrl+U
\cap	intersection	intersection operator for sets	Ctrl+N
$'$	complement	transpose operator for matrices/complement operator for sets	Ctrl+T
\downarrow	subscript	subscript operator for vectors and matrices	Ctrl+B
$\sqrt{\quad}$	square root	square root function	Ctrl+Q

To enter an **Angle**:

ANGLE	METHOD TO ENTER
Sine of the angle z	Type SIN(z)
Cosine of the angle z	Type COS(z)
Tangent of the angle z	Type TAN(z) TAN(z) is equal to SIN(z)/COS(z)
Cotangent of the angle z	Type COT(z) COT(z) is equal to COX(z)/SIN(z)
Secant of the angle z	Type SEC(z) SEC(z) simplifies to 1/COS(z)
Cosecant of the angle z	Type CSC(z) CSC(z) simplifies to 1/SIN(z)

ENTERING AN EXPRESSION continued


To enter a **Limit**:

Click on the Limit  icon. The Calculus Limit expression box appears. Enter the Equation, Variable, Limit Point, and Approach From. Click OK.

SUBSTITUTING VALUES

- A. 1. Highlight the expression. 2. Click on **Simplify** found on the Menu Bar.
3. Click on **Substitute for**. 4. Click on **Variables**.
5. Click on **each Variable** and type in its value.

OR

- B. 1. Highlight the expression. 2. Click on the Substitute  icon found on the Tool Bar.
3. Click on **Substitute for**. 4. Click on **Variables**. 5. Click on **each Variable** and type in its value.

SOLVING AN EQUATION

1. Highlight the expression.
A. 1) Click on **Solve** found on the menu bar.
2) Click on Expression.
3) Select how you want to solve the equation.
a) Algebraically - Click on the variable you wish to solve for.
b) Numerically - You can change the lower and upper bounds.
c) Either - See below for entering a system of equations.

OR

- B. Click the Solve icon 

*Note: If Derive cannot solve an equation, the answer displayed will be [].


ENTERING A SYSTEM OF EQUATIONS

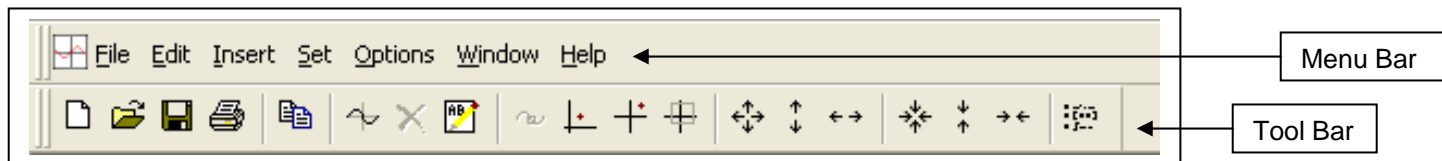
1. Click on **Solve** on the Menu Bar. 2. Click on **System**.
3. Type in the **number of equations** in the system. 4. Type in the **equations**.
6. Click **Solve**.

CREATING A FUNCTION TABLE


1. Highlight the expression.
2. Click on **Calculus** found on the Menu Bar.
A. Click **Vector**.
B. Enter a number for the Starting Value of the table.
C. Enter a number for the Ending Value of the table.
D. Enter a number for the Step Size of the table.
E. Click **Simplify**.
3. Click on Simplify found on the Menu Bar.
A. Click Approximate.
B. Enter a number for the Digits of Precision.
C. Click Approximate.

GRAPHING YOUR EQUATION

Highlight the equation you wish to graph. Click the 2-D graph icon  found on the Tool Bar. The following window will appear above a grid.



Click on **Plot** found on the Tool bar to have your equation graphed.

You can also create a 3-D graph by highlighting the equation and clicking on the 3-D graph icon .

To show Grid Lines on your graph:

1. Click on **Options** on the Menu Bar.
2. Click on **Grids**.
3. In Display area, click **Lines**.

PRINTING YOUR GRAPH

1. Click on **File** on the Menu Bar.
2. Select **Print**.
3. Click on the **Options** button.
4. Click on the **Fonts** button. Change the **Size** of the font to **10** or **12**. Click **OK**. Click **OK** again.
5. Click on the **Properties** button. Select **Landscape**. Click **OK**. Click **OK** again.

FUNCTION KEYS:

F1 will display the **Help** window for Derive.

F3 will **copy** the highlighted expression and **paste** it into the open Author Expression box.

F4 puts **parenthesis** around the highlighted expression and **pastes** it into the Author Expression box.

SAVING YOUR WORK ON DISKETTE:

1. Click on **File**.
2. Click on **Save As**.
3. Click on the **down arrow** by the **SAVE IN** box.
4. Click on **3 1/2 Floppy (A:)**
5. Type in a **name** for your file.
6. Click on **SAVE**.

INPUT EXAMPLES:

EXPRESSION	HOW TO INPUT FOR DERIVE
$\frac{1}{2}$	1/2
$\frac{x}{2} + \frac{x}{3}$	X/2 + X/3
$\frac{1}{X} + \frac{1}{X+1}$	1/X + 1/(X+1)
e^x	e^x
$\sin^2 x$	(sin x)^2
$\sin(x^2)$	sin(X^2)
\sqrt{X}	√X
$\sqrt{X - Y}$	√(X-Y)