

Enter the expression using the customary syntax: addition, + key; subtraction, - key; division, / key; powers, ^ key; multiplication, \* key. (However, multiplication does not require a \* - key, i.e., entering  $2x$  has the same effect as  $2*x$ . DfW then displays the expression in 2-dimensional format. Check again to make sure that the 2-dimensional format agrees with what you enter.

Try the following expressions:

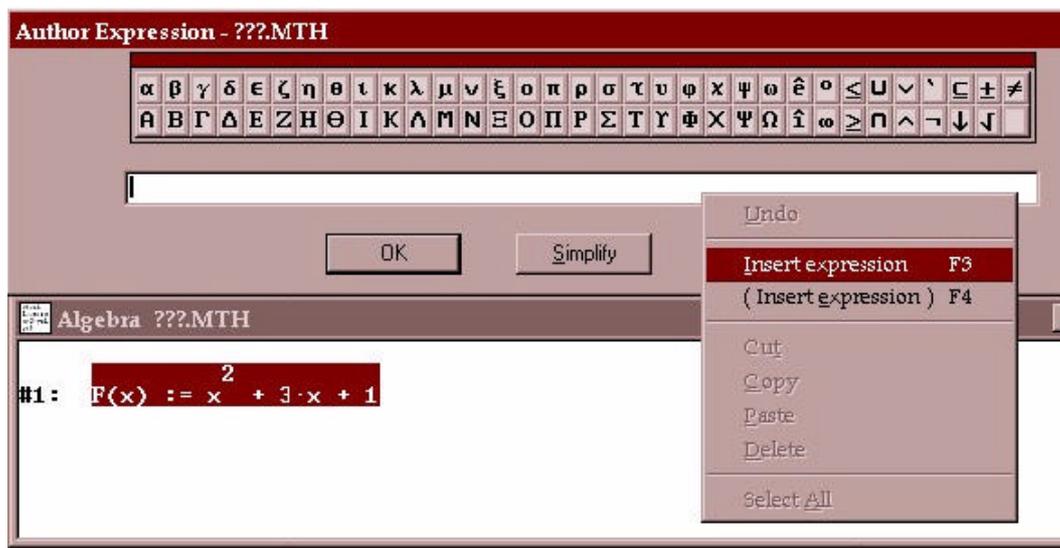
1. 520
2.  $x^3$
3.  $c^2x$
4.  $b^{2x}$
5.  $\sin(x)$
6.  $\sin(b)x$
7.  $\sin(bx)$
8.  $\frac{7x^2 - 2x}{3x^3 - 7}$
9.  $(b + c)^{\frac{1}{2}}$
10.  $\sqrt{b + c}$

If you get a syntax error when you press the enter key, the problem is usually mismatched parentheses. Always use the round parentheses and not the square brackets since they are reserved for vector notation. Special characters are on the Author form. They can also be entered via a combination of key strokes. E.g.

Ctrl + p or typing pi gives  $\pi$ ;

Ctrl + e or typing #e gives Euler's constant  $e$ .

To edit an expression, say expression #1, highlight expression #1 and click . This will bring up the Author form. With the mouse pointer within the entry box, click the right most button. A menu will open with several options, one of which is the Insert Expression option. Clicking this option puts the highlighted expression of the current algebra window into the author box. Edit this expression as you would in any windows word processor. Position the cursor by either clicking at the required position or by the arrow keys. Highlighting or selecting a subexpression and typing replaces the selected text with the new text. One can use the Edit/Copy Expression menu or Ctrl-C to place a highlighted expression from an algebra window onto the clipboard and then into the author form by right clicking the mouse and click the Paste to copy the clipboard content.



The simpler method of just right clicking the mouse and then insert the expression is the best way as long as you are in a single window.

You select or highlight expressions in the algebra window by clicking on them. For more complicated expression, you can click several times until the desired subexpression is selected. This probably requires a little practice. For example, you can select the  $x+2$  part of  $\sin\left(\frac{x^2}{(x^2+1)(x+2)}\right)$  by clicking on  $(x+2)$  4 times.

Displayed expressions are numbered. You can refer to them as # $n$ . We can author  $\frac{\sin(bx)}{c^2x}$  as #7/#3 from the previous expressions for practice. When you start DfW it is in a character mode. This means DfW treats each single character as a variable. So if you type  $ax$ , DfW takes this to be  $a$  times  $x$ . The exceptions to this are the functions DfW knows about. Thus if you type  $x\sin x$ , DfW knows that you want  $x\sin(x)$ . DfW displays all variables in lower case and all functions in upper case.

## 2. Simplifying and Approximating

After you enter an expression, DfW displays it in 2-dimensional form but does not simplify it. Thus, integrals are displayed with the integral sign and derivatives are displayed using the usual notation. Round-bracketed expressions are displayed unexpanded. To simplify (that is, to evaluate) the expression click the  button or Simplify/Basic. DfW uses exact calculation. If you author square root of 27,  $\sqrt{27}$  will be displayed; if you simplify this, you will get  $3\sqrt{3}$ . If you are interested in a decimal approximation, click the  button. The number of decimal places displayed can be changed to any number by Declare/Algebra State/Output and entering the new number of decimals. Alternatively, you can choose Simplify/Approximate and enter a new number of decimals. The only drawback to this is that when you save the file the extra decimals will be ignored, unless you also set the Output decimal places appropriately.