

Introduction to Maple Fall 2009

Start by double clicking the Maple icon to open a new Maple document. You can execute a command by simply typing it in and hitting enter.

See what happens when you execute each of the following.

1. $2*3$
2. $\text{sqrt}(9)$
3. 2^3

You can also enter commands using the pull-down menus to the left.

4. Try using the menu on the left to compute $\sqrt{9}$ and $\sqrt{2}$.

Notice that like many calculators, Maple gives exact answers. To get a decimal expansion use the command `evalf`. Execute the following.

5. $\text{evalf}(\text{sqrt}(2))$

Maple knows the familiar mathematical constants like π and e . Execute the following.

6. Pi
7. $\text{evalf}(Pi)$

You can access the number e using the pull-down menu or using the command `exp`. Execute each of the following. Note that if you just type the letter e , Maple treats it as a variable (rather than the constant $e \approx 2.71828$).

8. $\text{exp}(1)$
9. $\text{exp}(2)$
10. $\text{evalf}(\text{exp}(1))$
11. $\text{evalf}(e)$ Try this using e from the menu, then see what happens when you do this by typing the letter e . There's a big difference!
12. $e^{\ln 2}$ (Think about what answer you expect to get.)

Here are some more commands to execute:

13. $\text{cos}(Pi/4)$
14. $\text{evalf}(\text{sin}(Pi/4))$
15. $\text{cos}(Pi/2)$
16. Try entering the following (in order)
 $\text{cos}(Pi/2)$
 $\text{evalf}(\%)$
 $2*\%$

The symbol `%` will always return the last Maple output, so the command $\text{evalf}(\%)$ will always give you the decimal approximation of the last Maple output.

Solving Equations and Inequalities.

The command for solving an equation or inequality is solve. The syntax is:

$$\text{solve}(\text{'equation with variable } x', x)$$

For example, to solve the equation $2x + 1 = 0$, type:

17. $\text{solve}(2x + 1 = 0, x)$

If you leave off the last x , Maple will *usually* realize that you are solving for x . This is more important if you have more than one variable in your expression.

Try each of the following. Note: you can find the symbols \leq and \geq under Common Symbols on the left.

18. $\text{solve}(x^2 > 1, x)$

19. $\text{solve}(2x + 1 \leq 3, x)$

You can use Maple to create and evaluate a function:

The following will create the function $f(x) = 3x$.

20. $f := x \rightarrow 3x$

You can then evaluate the function $f(x)$ for different values of x :

21. $f(2)$

22. $f(1)$

23. $f(17)$

Plotting

The syntax for plotting a function is

$$\text{plot}(\text{'function to be plotted'}, x = \text{'smallest } x \text{ value' .. 'biggest } x \text{ value'})$$

For example:

24. $\text{plot}(3x^3 - 5, x = -5..5)$

25. $\text{plot}(\cos(x), x = -2 * Pi..2 * Pi)$

26. $\text{plot}(x^6 - 2x^3 - 20x^2, x = -3..3)$

27. $\text{plot}(\exp(x), x = -3..3)$

You can also plot the function $f(x)$ that we defined above:

28. $\text{plot}(f(x), x = -1..1)$

Notice that you only have to indicate the x values when you plot, and Maple will choose appropriate y values. You can change the y values if you like.

29. Compare the following

$$\text{plot}\left(\frac{1}{x}, x = -2..2\right)$$
$$\text{plot}\left(\frac{1}{x}, x = -2..2, y = -10..10\right)$$

Eventually we will use Maple for a lot of other fun stuff.