

[2.1] Force complete simplification with repeated evaluation

The 89/92+ CAS does not always completely simplify expressions. For example, if you enter this on the command line

$$y^3 | y=2 \cdot \sqrt{2} \cdot r$$

this is returned

$$8 \cdot 2^{3/2} \cdot r^3$$

which is correct but not completely simplified. If you paste this result into the command line and enter it, the fully simplified result is returned:

$$16 \cdot \sqrt{2} \cdot r^3$$

Another way to force the complete simplification seems to be to evaluate the expression in a function, like this:

```
tt(ex)
func
ex
Endfunc
```

Executing this call

$$tt(y^3 | y=2 \cdot \sqrt{2} \cdot r)$$

returns the completely simplified result. Sam Jordan offers these additional comments:

I've noticed the same thing with other large equations. If you enter an expression on the command line, the TI-89 will automatically simplify it. If it is too complex, it goes as far as it can, and leave it in a bit simpler state, but doesn't finish it. If you only paste the partially simplified answer back into the input line, and hit [ENTER] again, it will finish the job. It seems to set a limit on the amount of work that it does on each pass through the simplification routine. Eventually you get to the point where re-entering the answer no longer changes the result, and you can assume that the simplification is complete.

(Credit to Roberto-Perez Franco and Sam Jordan)