Calculator: Small Errors in Calculations (4/95)

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TOPIC ---

When I type the following equation into the graphing calculator, the calculator
returns FALSE when it should return TRUE:

762.50 -191.69 - 63.87 - 28.89 = 478.05

Why is this happening?

DISCUSSION --

The reason for the calculator's behavior is the fact that you are trying to do
decimal math on a binary processor. Not all decimal fractions can be represented
exactly in binary form. This leads to very small errors in calculations and is
demonstrable in most computers.

The way around this is to keep the error to an insignificant amount and round
the result to desired number of decimal places. For example, if calculations are
being done in dollars and cents, only two decimal places are needed. So when the
calculator reports that $5.00 - 4.90 - 0.10 = 8.80914E-20$
(0.0000000000000000000880914), the result is rounded to 0.

There is an article on page 42 in the February 20, 1995 issue of MacWeek that
also explains this behavior.

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