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Computer interface for elementary mathematics

Can one learn mathematics through a computer interface or does one need to a priori know it before heading to the keyboard?

Machines and software behave logically by their very nature, and logical structure is precisely one of the important components missing from students having difficulty with mathematics. Other subject areas have a much greater advantage: accounting is procedural with interfaces largely through common table-like balance sheets and financial statements; economics makes heavy visual use of graphs. But mathematics' language is full of those unintuitive and abstract objects such as operation signs and esoteric symbols, brackets, variables, fractions, polynomials, trig functions . . . already all at the high school level, and even the highly sophisticated symbols for integrals, limits, . . .

Tough enough to learn mathematics, no need to make it harder! The old paper exam full of nonsense but a few key numbers and formulas may be quite forgiving and even return passing marks, thanks to the quick recognition capability of the marker's experiences brain. But the computer interface for mathematics has nowhere even closely achieved this high level of support for those struggling with mathematics; it presents itself instead as a barrier to learning. On the other hand, mathematics typesetting and computational software have surprisingly made superlative leaps for those in control of the discipline.

We review and discuss some of the many attempts and current practices, and argue toward an optimistic breakthrough in the not so distant future.