Re: opponents of taylor and l'hospital ?

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- *From*: "Dave L. Renfro" <renfr1dl@xxxxxxxxx>
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lwalke3@xxxxxxxxx wrote (in part):

> Suppose a high school senior taking the AP Calculus
> exam this month sees the following problem:
>
> lim (x−>0) (sin x)/x =
> A) 0
> B) 1
> C) −1
> D) does not exist
>
> If I were this student, I'd simply use L'Hopital's
> rule and find the anwer to be (cos x)/1 = cos 0 = 1
> in seconds. Why should I care that the limit is
> used in the proof that d/dx (sin x) = cos x?
> The question didn't ask to prove that
> d/dx (sin x) = cos x −− it asked to find the
> limit, and the fastest way to find the limit
> is L'Hopital's rule.

I agree with you, although for this particular limit students shouldn't have to rely on any rule. This should be one of the "common limits" they know by heart (like the multiplication table), because it is so useful in finding other limits by algebraic manipulations, something they would have had a bit of practice with in the first few weeks of their calculus class.

I think the main reason some people don't like the use of L'Hopital's rule is not this issue, but rather because it is essentially a "black box" process that typically sheds very little additional insight (for example, inequalities used to set up the squeeze theorem allow for errors and/or convergence rates to be estimated) and tends not to reinforce any other concepts except for the mechanical process of using

short−cut derivative formulas (in fact, this is what
I primarily used L'Hopital's rule for −− a way to get
students to review derivative short−cut formulas).

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