Bentley Appointee Late Review
Calculus and Calculus AP Textbooks
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Governor Bentley encouraged the recent appointees (of which I am one) to the 2011-12 Mathematics State Textbook Committee to provide late reviews of the texts already approved for use in Alabama schools.

After teaching college mathematics, and calculus in particular, as a professor at Auburn University for many years, I am qualified to evaluate the texts on the list, texts authored by Larson/Edwards, Stewart, and Rogawski.

All three “brands” are adequate, but a better textbook can make the difference between success and failure in the classroom, both to the students and to the teacher. I offer the following comments to the secondary schools of Alabama when they choose their calculus texts.

I recommend them in this order:
1. Larsen/Edwards
2. Stewart
3. Rogawski

The following are important differences between the three texts on one sample concept, the introduction of the derivative.

Reasons A and B work to promote Larson and Stewart over Rogawski:

A. The two texts, Larsen and Stewart, have many excellent geometric exercises (e.g. given the graph of \( y = f(x) \), but not given the formula for \( y \), draw the graph of \( y' \).) On the other hand, Rogawski has very few. It can be argued that mastering geometric interpretations in calculus is crucial to a solid understanding.

B. Larsen and Stewart both present pictorial examples of three types of functions without derivatives at a given point: at a discontinuity, at a “sharp” point, and at a vertical tangent point. These types of examples are very helpful to the beginning calculus student, but Rogawski does not present them.

Reason C suggests that Larsen might be preferred over Stewart:

C. Most books define the derivative at a point by way of the slope of the tangent line at the point because of the geometric clarity of this approach. This is what Larsen does, and he does it in a natural straightforward manner. Stewart introduces the tangent line problem more than fifty pages before the derivative. Then, when defining the derivative, he uses not only the tangent line slope, but velocity and a pudding of several other rate-of-change examples such as the rate of change of the national debt. In short, he tries to introduce difficult details of the power of the derivative before the notion of the derivative has gelled in the minds of the students.

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