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Robert A. Peacock* (rpeacock@yhc.edu), P. O. Box 192, Young Harris, GA 30582. *Clarifying the parallels between single-variable and multivariate calculus: Creating a more cohesive curriculum.* Preliminary report.

The Concept: We could improve the multivariate calculus curriculum so that the following goals are accomplished simultaneously: (1) decrease the gap that currently exists between undergraduate and graduate studies in multivariate analysis; (2) clarify, by the force of actual problem types that students work in the course, the several parallels between single-variable and multivariate calculus.

The presentation of multivariate differentiation gets substantially restructured to set up, in turn, a clear presentation of the following parallel topics and concepts between single-variable and multivariate calculus: the difference quotient form is the driver for the notion of derivative; linearizations have the “ $y = mx + b$ ” form and can be used to approximate function values in a neighborhood of the point of linearization; the chain rule has the same multiplicative form; the equation $f'(\alpha) = 0$ can still be used in the context of critical points; the substitution theorem in integration has essentially the same “chain rule” form. Surface integrals is a topic that, I think, is a beneficiary of this approach since all theoretically sound notation will have been developed by that point in this course. (Received September 29, 2005)