

1127-55-19

Kristine Bauer, Brenda Johnson, Christina Osborne* (cdo5bv@virginia.edu), **Emily Riehl** and **Amelia Tebbe**. *Directional derivatives and higher order chain rules for abelian functor calculus.*

One of the most fundamental tools in calculus is the chain rule for functions. Huang, Marcantognini, and Young developed the notion of taking higher order directional derivatives, which has a corresponding higher order iterated directional derivative chain rule. When Johnson and McCarthy established abelian functor calculus, they constructed the chain rule for functors which is analogous to the directional derivative when $n = 1$. In joint work with Bauer, Johnson, Riehl, and Tebbe, we defined an analogue of the iterated directional derivative and provided an inductive proof of the analogue to the HMY chain rule. Our initial investigation of this result involved a concrete computation of the case when $n = 2$, which will be presented in this talk. (Received December 20, 2016)