1035-Z1-366 **David J Schmitz*** (djschmitz@noctrl.edu), 30 N. Brainard St., Naperville, IL 60613, and **Charles W Gatz**. *Inverse Preserving Functions.*

If f is a function and n a positive integer, then the exponent n in f^n is applied to the outputs of the function (as in $\sin^2(x) = [\sin(x)]^2$). However, the "exponent" -1 does not follow this pattern. Instead of indicating the use of the reciprocal (or inverse) of each output from f, the notation f^{-1} denotes the inverse function of f in the case when f (or a suitable restriction of f) is bijective (as in $\sin^{-1}(x) = \arcsin(x)$). This exceptional exponential syntax can certainly be confusing for students in pre-calculus and calculus courses. But do there exist functions where the two possible interpretations of the exponent -1 lead to the same result? In this paper we uncover conditions for when a bijective function $f : G \to G$ from a group G to itself satisfies the identity $f^{-1}(x) = [f(x)]^{-1}$ for every $x \in G$. We call such functions *inverse preserving*. In addition to finding examples of such functions defined on cyclic and dihedral groups, we discovered two (relatively elementary) inverse-preserving functions defined on the multiplicative group of non-zero real numbers that pre-calculus and calculus students may have possibly encountered. (Received September 04, 2007)