962-11-518 **A. W. Goodman*** (goodmanaw@aol.com), Department of Mathematics, University of South Florida, 4202 East Fowler Avenue, PHY 114, Tampa, FL 33620. *Pure Multigrades.*

Two multigrades of integers A and B form a multigrade of type (D,n) if $\sum_{x\in A} x^d = \sum_{y\in B} y^d$ for each $d = 1,2,\ldots,D$, and $|A| = |B| = n$. The term multiset implies that elements may be represented in either A or B. If A and B are true sets (no repititions permitted in $A \cup B$) we say that the pair (A,B) form a pure multigrade of type (D,n). Much is known about multigrades and pure multigrades, but this paper contains some new results and poses a few new open problems. Composition, the addition of two multigrades is defined in the obvious way. A pure multigrade is said to be primary if it cannot be obtained as the sum of two pure multigrades. The representation of a pure multigrade as a sum of primary multigrades is not unique. Counting the number of normalized pure primary multigrades with $n \leq N_0$ is an open problem. (Received September 15, 2000)