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Joel Clarke Gibbons* (jgibbons@logisticresearch.com), 4052 Niles Road, Saint Joseph, MI 49085. *(n+3)-Coloring the n-Sphere.*

We address a combinatorial proposition for the n -sphere and a corresponding proposition in inversive geometry on the n -sphere, and demonstrate the intimate connection between them. Specifically, in terms of combinatorial geometry, we show that any coloring of the n -sphere by $n+3$ colors must $(n+2)$ -color some $(n-1)$ -sphere. In regard to inversive geometry, we characterize the structure of the class of smallest subsets of the n -sphere that has the property that if T is a well-defined function of the n -sphere that preserves $(n-1)$ -spheres and if the image of T contains a member of this class, T must be an inversive transformation. Lastly, we demonstrate that the combinatorial theorem is equivalent to the theorem that defines this class of sets. (Received March 18, 2011)