MR11438 (6,165c) 56.0X
Hopf, Heinz
Eine Verallgemeinerung bekannter Abbildungs- und Überdeckungssätze. (German)
Portugal. Math. **4** (1944), 129–139.

The mapping and covering theorems in question are by (1) Borsuk-Ulam, (2) Alexandroff-Hopf and (3) Lusternik-Schnirelmann-Borsuk. Theorem (2) asserts: if the n-dimensional sphere S^n is covered by $n+2$ closed sets $F_1, F_2, \cdots, F_{n+2}$, of which none contains an antipodal pair of points of S^n, the logical product of any $n+1$ of the F_i is not empty. The author shows that the number π (the angular distance of an antipodal point-pair) has no special force in validating this theorem, so that it remains true when "antipodal pair of points" is replaced by "pair of points at angular distance a," where a is any given number between 0 and π. Furthermore, this theorem generalizes to any closed n-dimensional manifold with a regular Riemannian metric. Theorems (1) and (3) generalize in the same way, but the chief interest in the argument pertains to (2). There is appended a discussion of several related unsolved problems.