

3.16 Theorem. Let n be a natural number. Every complete residue system modulo n contains n elements.

Proof. Suppose not. That is, let the set $\{a_1, a_2, \dots, a_k\}$ of integers not contain n elements. Suppose this set has less than n elements, then by definition of CRS, one element from the integer set is congruent to two or more CCRS modulo n , which is a contradiction to the definition. On the otherhand, letting the set have more than n elements implies two or more a_i are congruent to one of the CCRS modulo n , which also contradicts the definition of CRS. Thus, every complete residue system modulo n contains n elements. \square