

1. Let m be a positive integer. A set $\{x_1, x_2, \dots, x_m\}$ is called a *complete residue system* modulo m if what condition is satisfied?

Answer: The set is a complete residue system if for every integer y , there is exactly one x_j such that $y \equiv x_j \pmod{m}$.

2. Let m be a positive integer. By definition, a set $\{r_1, r_2, \dots, r_k\}$ is a *reduced residue system* modulo m if three conditions are satisfied. What are these three conditions?

Answer:

- (a) For each i , $(r_i, m) = 1$;
- (b) For $i \neq j$, we have $r_i \not\equiv r_j \pmod{m}$;
- (c) For each integer y such that $(y, m) = 1$, there is an r_i such that $y \equiv r_i \pmod{m}$.