Lemma 0. Let $n \in \mathbb{Z}$. Then $n \mid 0$.

Proof. Let $n \in \mathbb{Z}$ be given. By definition of divisibility, $0 = 0n$. Therefore, $n \mid 0$.

1.9 Theorem. Let $a, n \in \mathbb{Z}$ with $n > 0$. Then $a \equiv a \pmod{n}$.

Proof. Let Let $a, n \in \mathbb{Z}$ with $n > 0$ be given. Since $a - a = 0$ and any $n > 0$ divides 0, by Lemma 0, $n \mid (a - a)$. Therefore, by definition, $a \equiv a \pmod{n}$. □