Lemma 4.38. [289] *Let $n, m, k \in \mathbb{N}$.*

1. *For every n we have $0 \leq n$*
2. *$n \leq m$ if and only if $n < S(m)$.*

   Note that these two points satisfy [(4.29)],[(4.28)] *in* [26H]
3. *For every n we have $n < S(n)$*
4. *$n < m$ if and only if $S(n) \leq m$.*
5. *If $n \leq m \leq S(n)$ then $m = n$ or $m = S(n)$.*

The proofs are left as exercise [28D]*. (After we will prove that the relation is total, then by* [26X] *the last two are equivalent.)*