

Inference at \* 1 2 1 1 1  
of proof for Lemma fincr\_formation:

1.  $i : \mathbb{N}$
2.  $f : \{f \mid i : \{i_1 : \mathbb{N} \mid i_1 < i\} \rightarrow \text{if } (i =_0 0) \text{ then } \mathbb{Z} \text{ else } \{f(i - 1)\dots\} \text{ fi } \}$
3.  $j : \mathbb{N}$
4.  $\forall j_1 : \mathbb{N}. (j_1 < j) \Rightarrow (j_1 < i) \Rightarrow (f(j_1) \in \mathbb{Z})$
5.  $j < i$
- $\vdash f(j) \in \mathbb{Z}$   
by ((With  $j$  (D 2))  
THENW ((Auto\_aux (first\_nat 1:n) ((first\_nat 1:n), (first\_nat 3:n))) (first\_tok :t) init\_term))).

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6.  $y : \text{if } (j =_0 0) \text{ then } \mathbb{Z} \text{ else } \{f(j - 1)\dots\} \text{ fi}$
7.  $y = f(j)$
- $\vdash f(j) \in \mathbb{Z}$