

Inference at \* 1 0 1  
of proof for Lemma integer sqrt:

1.  $n : \mathbb{Z}$

2.  $n \geq 0$

$\vdash \exists r:\mathbb{N}. (((r * r) \leq n) \& (n < ((r+1) * (r+1))))$   
by ( $\backslash$ p.IntInd (get\_int\_arg 'hn' p) p)

1: .....downcase..... NILNIL

2.  $n < 0$

3.  $((n+1) \geq 0) \Rightarrow (\exists r:\mathbb{N}. (((r * r) \leq (n+1)) \& ((n+1) < ((r+1) * (r+1))))$

$\vdash (n \geq 0) \Rightarrow (\exists r:\mathbb{N}. (((r * r) \leq n) \& (n < ((r+1) * (r+1))))$

2: .....basecase..... NILNIL

(no hyps)

$\vdash (0 \geq 0) \Rightarrow (\exists r:\mathbb{N}. (((r * r) \leq 0) \& (0 < ((r+1) * (r+1))))$

3: .....upcase..... NILNIL

2.  $0 < n$

3.  $((n - 1) \geq 0) \Rightarrow (\exists r:\mathbb{N}. (((r * r) \leq (n - 1)) \& ((n - 1) < ((r+1) * (r+1))))$

$\vdash (n \geq 0) \Rightarrow (\exists r:\mathbb{N}. (((r * r) \leq n) \& (n < ((r+1) * (r+1))))$

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