

Inference at \* 1 2 1  
of proof for Lemma integer sqrt:

1.  $n : \mathbb{Z}$   
2.  $0 < n$   
3.  $r : \mathbb{N}$   
4.  $(r * r) \leq (n - 1)$   
5.  $(n - 1) < ((r+1) * (r+1))$   
 $\vdash \exists r:\mathbb{N}. (((r * r) \leq n) \& (n < ((r+1) * (r+1))))$   
by Decide  $((r+1) * (r+1)) \leq n$  THEN Auto

1:

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

2:

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

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