```
hdivision  THM

⊢  all
|  (λn:hnum. implies
|            (lt(0,n)
|            ,all
|             (λk:hnum. and
|                         (equal(k,add(mult(div(k,n),n),mod(k,n)))
|                         ,lt(mod(k,n),n)))))
| by HN THEN StrongAuto THEN Try (Complete (Unfold `label` 0))
|
|\
| 1. n : ℕ
| 2. 0<n
| 3. k : ℕ
| ⊢  k = ndiv(k;n)·n+nmod(k;n)
| | by Unab [`ndiv`;`nmod`] THEN StrongAuto
| |    THEN
| |    Try (Complete (Unfold `label` 0))
| |
| 1. n : ℕ
| 2. 0<n
| 3. k : ℕ
| ⊢  k
| |  =
| |  if n=_{2}0 then 0 else k ÷ n fi ·n+if n=_{2}0 then 0 else k rem n fi
| | by BifCase THEN Simp THEN StrongAuto
| |
| 1. n : ℕ
| 2. 0<n
| 3. k : ℕ
| 4. ¬n = 0
| ⊢  k = (k ÷ n)·n+(k rem n)
|   by Inst Thm* ∀a:ℤ, n:ℤ^{-0}. a = (a ÷ n)·n+(a rem n)    {div_rem_sum}
|      [k;n]
|      THEN
|      StrongAuto
|      THEN
|      Try (Complete (Unfold `label` 0))
|
.\
. 1. n : ℕ
. 2. 0<n
. 3. k : ℕ
. ⊢  nmod(k;n)<n
. | by Unab [`nmod`] THEN BifCase THEN Simp THEN StrongAuto
. |
. 1. n : ℕ
. 2. 0<n
. 3. k : ℕ
. 4. ¬n = 0
. ⊢  (k rem n)<n
.   by L Thm* ∀a:ℕ, n:ℕ^{+}. 0≤(a rem n) & (a rem n)<n    {rem_bounds_1}
.      THEN
.      StrongAuto
```

```
.       THEN
.       Try (Complete (Unfold `label` 0))
END
```