

## **rings\_1**<sup>6,26</sup>

DIR: rng\_sig\_object\_directory

STM: rng\_sig\_inc

ABS: IsRing( $T$ ; *plus*; *zero*; *neg*; *times*; *one*) **ring\_p**

STM: ring\_p\_wf

ABS: Rng **rng**

STM: rng\_wf

STM: rng\_properties

STM: rng\_all\_properties

STM: assert\_of\_rng\_eq

STM: decidable\_rng\_eq

ABS: CRng **crng**

STM: crng\_wf

STM: crng\_properties

STM: crng\_all\_properties

ABS:  $r \downarrow \text{xmn}$  **mul\_mon\_of\_rng**

STM: mul\_mon\_of\_rng\_wf

STM: mul\_mon\_of\_rng\_wf.c

STM: mul\_mon\_of\_rng\_wf.a

STM: mul\_mon\_of\_rng\_wf.b

ABS:  $r \downarrow +\text{gp}$  **add\_grp\_of\_rng**

STM: add\_grp\_of\_rng\_wf

STM: add\_grp\_of\_rng\_wf.a

STM: rng\_minus\_over\_plus

STM: rng\_minus\_minus

STM: rng\_minus\_zero

STM: rng\_plus\_inv  
 STM: rng\_plus\_inv\_assoc  
 STM: rng\_plus\_zero  
 STM: rng\_plus\_cancel\_l  
 STM: rng\_plus\_assoc  
 STM: rng\_times\_assoc  
 STM: rng\_times\_one  
 STM: crng\_times\_comm  
 STM: crng\_times\_ac\_1  
 STM: rng\_times\_over\_plus  
 STM: rng\_times\_zero  
 STM: rng\_times\_over\_minus  
 STM: rng\_plus\_comm  
 STM: add\_grp\_of\_rng\_wf\_b  
 STM: rng\_plus\_ac\_1  
 STM: ring\_triv  
 ABS:  $\Sigma(r) \ i \leq k < j. \ E(k)$  **rng\_sum**  
 STM: rng\_sum\_wf  
 STM: comb\_for\_rng\_sum\_wf  
 ABS:  $\Pi(r) \ i \leq k < j. \ E(k)$  **rng\_prod**  
 STM: rng\_prod\_wf  
 ABS:  $a \downarrow + \text{nsgp}$  **nsgrp\_of\_ideal**  
 STM: nsgrp\_of\_ideal\_wf  
 ABS:  $a \mid b$  in  $r$  **ring\_divs**  
 STM: ring\_divs\_wf  
 ABS:  $r \neq 0$  **ring\_non\_triv**  
 STM: ring\_non\_triv\_wf

ABS:  $\text{IsIntegDom}(r)$  **integ\_dom\_p**

STM: integ\_dom\_p\_wf

STM: sq\_stable\_integ\_dom\_p

ABS:  $\text{IsField}(r)$  **field\_p**

STM: field\_p\_wf

STM: any\_field\_is\_integ\_dom

ABS:  $\text{IntegDom}\{i\}$  **integ\_dom**

STM: integ\_dom\_wf

ABS:  $\text{Field}\{i\}$  **field**

ABS:  $r\text{-Prime}(u)$  **rprime**

STM: rprime\_wf

ABS:  $S$  Ideal of  $R$  **ideal\_p**

STM: ideal\_p\_wf

ABS:  $\text{Ideal}(r)\{i\}$  **ideal**

STM: ideal\_wf

ABS:  $(0r)$  **zero\_ideal**

STM: zero\_ideal\_wf

ABS:  $(1r)$  **one\_ideal**

STM: one\_ideal\_wf

ABS:  $(a)r$  **princ\_ideal**

STM: princ\_ideal\_wf

STM: ideal\_defines\_eqv

STM: det\_ideal\_ap\_elim

STM: det\_ideal\_defines\_eqv

ABS:  $\text{Carrier}(r/d)$  **quot\_ring\_car**

STM: quot\_ring\_car\_wf

STM: quot\_ring\_car\_qinc

ABS:  $r / d$  **quot\_ring**  
 STM: quot\_ring\_wf  
 STM: type\_inj\_wf\_for\_qrng  
 STM: quot\_ring\_car\_elim  
 STM: quot\_ring\_car\_elim\_a  
 STM: quot\_ring\_car\_elim\_b  
 STM: all\_rng\_quot\_elim  
 STM: all\_rng\_quot\_elim\_a  
 STM: rng\_car\_qinc  
 ABS:  $\text{IsPrimeIdeal}(R;P)$  **prime\_ideal\_p**  
 STM: prime\_ideal\_p\_wf  
 STM: sq\_stable\_\_prime\_ideal  
 ABS:  $\text{IsMaxIdeal}(r;m)$  **max\_ideal\_p**  
 STM: max\_ideal\_p\_wf  
 ABS:  $\text{rng\_hom\_p}(r;s;f)$  **rng\_hom\_p**  
 STM: rng\_hom\_p\_wf  
 ABS:  $\text{rng\_chom\_p}(r;s;f)$  **rng\_chom\_p**  
 STM: rng\_chom\_p\_wf  
 ABS:  $\text{RingHom}(R;S)$  **ring\_hom**  
 STM: ring\_hom\_wf  
 ABS:  $\text{nat}(r;a)$  **ring\_quot\_hom**  
 STM: idom\_alt\_char  
 STM: quot\_by\_prime\_ideal  
 STM: princ\_ideal\_mem\_cond  
 STM: ideal\_of\_prime  
 ABS:  $\mathbb{Z}$ -rng **int\_ring**  
 STM: int\_ring\_wf

ABS:  $(i)\mathbb{Z}$ -det-fun **int\_pi\_det\_fun**

STM: int\_pi\_det\_fun\_wf

STM: int\_pi\_detach

STM: prime\_ideals\_in\_int\_ring

ABS: choose( $n;i$ ) **choose**

STM: choose\_wf

STM: comb\_for\_choose\_wf

ABS:  $e \uparrow r n$  **rng\_nexp**

STM: rng\_nexp\_wf

STM: comb\_for\_rng\_nexp\_wf

ABS:  $n \cdot r e$  **rng\_nat\_op**

STM: rng\_nat\_op\_wf

STM: comb\_for\_rng\_nat\_op\_wf

STM: rng\_nexp\_zero

STM: rng\_nexp\_unroll

STM: rng\_nat\_op\_one

STM: rng\_nat\_op\_add

STM: rng\_sum\_unroll\_base

STM: rng\_sum\_unroll\_hi

STM: rng\_sum\_unroll\_unit

STM: rng\_sum\_unroll\_lo

STM: rng\_sum\_shift

STM: rng\_sum\_split

STM: rng\_sum\_plus

STM: rng\_times\_sum\_l

STM: rng\_times\_sum\_r

STM: rng\_times\_nat\_op

STM: rng\_times\_nat\_op\_r

STM: binomial

STM: sum\_of\_geometric\_prog

ABS: when  $b$ .  $p$  **rng\_when**

STM: rng\_when\_wf

STM: comb\_for\_rng\_when\_wf

STM: rng\_times\_when\_l

STM: rng\_times\_when\_r

STM: rng\_when\_of\_zero

STM: rng\_when\_thru\_plus

STM: rng\_when\_when

STM: rng\_when\_swap