

```

(init-moduli 5 13 17) = (221 170 -390)
*BIGM* = 1105

(bigp4tup '(2 -5 -4)) = 47
(bigp4tup '(2 -5 4)) = 242
(bigp4tup '(2 5 4)) = -268
(bigp4tup '(2 5 -4)) = -463

(mod (* 463 463) 1105) = 1104

(sqrt 1105) = 33.24154027718932 [Approximately]

(loop for rono in '(47 242 268 463) do
  (lightning 1105 rono) )
  n:      r_n    q_n    s_n    t_n
  /-----\
  0:    1105    --     1     0
  1:     47    23     0     1
  2:     24     1     1    -23
  3:     23     1    -1     24
  4:      1    23     2    -47
  5:      0 infty  -47   1105
  \-----/

  n:      r_n    q_n    s_n    t_n
  /-----\
  0:    1105    --     1     0
  1:     242     4     0     1
  2:     137     1     1    -4
  3:     105     1    -1     5
  4:      32     3     2    -9
  5:      9      3    -7    32
  6:      5      1    23  -105
  7:      4      1   -30   137
  8:      1      4    53  -242
  9:      0 infty -242   1105
  \-----/

```

n:	r_n	q_n	s_n	t_n
0:	1105	--	1	0
1:	268	4	0	1
2:	33	8	1	-4
3:	4	8	-8	33
4:	1	4	65	-268
5:	0	infty	-268	1105

n:	r_n	q_n	s_n	t_n
0:	1105	--	1	0
1:	463	2	0	1
2:	179	2	1	-2
3:	105	1	-2	5
4:	74	1	3	-7
5:	31	2	-5	12
6:	12	2	13	-31
7:	7	1	-31	74
8:	5	1	44	-105
9:	2	2	-75	179
10:	1	2	194	-463
11:	0	infty	-463	1105

(\* 23 23)= 529, (\* 24 24)=576, 529 + 576 = 1105  
 (\* 32 32)=1024, (\* 9 9)= 81, 1024 + 81 = 1105  
 (\* 33 33)=1089, (\* 4 4)= 16, 1089 + 16 = 1105  
 (\* 31 31)= 961, (\* 12 12)=144, 961 + 144 = 1105

(sqrt 1105) ~= 33.24154027718932 [Approximately]

### Bigger example

```
(%I11) (21598 * 21598);
(%o11)                                     466473604

(%I14) mod( 466473604+1 , 63509);
(%o14)                                     0

(sqrt 63509) ~= 252.00992043965255 [Approx.]

(lightning 63509 21598)
  n:    r_n    q_n    s_n    t_n
  /-----\
  0:    63509    --     1     0
  1:    21598     2     0     1
  2:    20313     1     1    -2
  3:    1285    15    -1     3
  4:    1038     1    16   -47
  5:     247     4   -17    50
  6:     50     4    84  -247
  7:     47     1  -353  1038
  8:     3    15   437 -1285
  9:     2     1 -6908  20313
 10:     1     2   7345 -21598
 11:     0  infty -21598  63509
  \-----/

(%I22) display(xsqrd : 247^2 , ysqrd : 50^2,   xsqrd + ysqrd );
        xsqrd = 61009
        ysqrd =  2500
61009 + 2500 = 63509
```