```
(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
\---------------------------------------/
```

Filename: `Problems/NumberTheory/sots-slides.latex`

```
   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]
```

Filename: `Problems/NumberTheory/sots-slides.latex`

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
```