B2

2.	5
11.	311(11)
1.1	311
.2	221
.11	11111

```
total num of chars: 5
total num of families: 3

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    none
chars where some polynomial has both positive and negative coeffs:
    none
chars where some polynomial has strictly negative coeffs:
    1.1 = 311                   in family 1.1 = 311

| 0 elements where some sequence of nonzero coeffs is not unimodal in abs value.
| 0 elements where some polynomial has both positive and negative coeffs.
| 1 elements where some polynomial has strictly negative coeffs.
    1.1 = 311                   in family 1.1 = 311
      #7 [ 1, 2, 1 ]
```

G2

phi{1,0}	G2
phi{1,3}'	G2(a1)(21)
phi{2,1}	G2(a1)
phi{2,2}	~A1
phi{1,3}	A1
phi{1,6}	1

```
total num of chars: 6
total num of families: 3

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    none
chars where some polynomial has both positive and negative coeffs:
    none
chars where some polynomial has strictly negative coeffs:
    phi{2,1} = G2(a1)           in family phi{2,1} = G2(a1)
    phi{2,2} = ~A1              in family phi{2,1} = G2(a1)

| 0 elements where some sequence of nonzero coeffs is not unimodal in abs value.
| 0 elements where some polynomial has both positive and negative coeffs.
| 7 elements where some polynomial has strictly negative coeffs.
    phi{2,1} = G2(a1)           in family phi{2,1} = G2(a1)
      #4 [ 2, 1 ]
      #5 [ 1, 2 ]
      #6 [ 2, 1, 2 ]
      #7 [ 1, 2, 1 ]
      #8 [ 2, 1, 2, 1 ]
      #9 [ 1, 2, 1, 2 ]
    phi{2,2} = ~A1              in family phi{2,1} = G2(a1)
      #11 [ 1, 2, 1, 2, 1 ]
```

B3

3.	7
21.	511(11)
2.1	511
.3	331(11)
1.2	331
11.1	322
111.	31111(11)
1.11	31111
.21	22111
.111	1111111

```
total num of chars: 10
total num of families: 6

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    none
chars where some polynomial has both positive and negative coeffs:
    none
chars where some polynomial has strictly negative coeffs:
    1.11 = 31111                in family 1.11 = 31111

| 0 elements where some sequence of nonzero coeffs is not unimodal in abs value.
| 0 elements where some polynomial has both positive and negative coeffs.
| 1 elements where some polynomial has strictly negative coeffs.
    1.11 = 31111                in family 1.11 = 31111
      #14 [ 1, 2, 1 ]
```

C3

3.	6
.3	42(11)
2.1	42
1.2	33
21.	411
11.1	222
.21	2211(11)
1.11	2211
111.	21111
.111	111111

```
total num of chars: 10
total num of families: 6

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    none
chars where some polynomial has both positive and negative coeffs:
    none
chars where some polynomial has strictly negative coeffs:
    2.1 = 42                    in family 2.1 = 42
    1.11 = 2211                 in family 1.11 = 2211

| 0 elements where some sequence of nonzero coeffs is not unimodal in abs value.
| 0 elements where some polynomial has both positive and negative coeffs.
| 21 elements where some polynomial has strictly negative coeffs.
    2.1 = 42                    in family 2.1 = 42
      #11 [ 3, 2, 1 ]
      #13 [ 2, 1, 3 ]
      #15 [ 1, 3, 2 ]
      #16 [ 1, 2, 3 ]
      #17 [ 3, 2, 1, 2 ]
      #18 [ 2, 1, 2, 3 ]
      #19 [ 2, 3, 2, 1 ]
      #20 [ 2, 1, 3, 2 ]
      #22 [ 1, 3, 2, 1 ]
      #23 [ 1, 2, 1, 3 ]
      #24 [ 1, 2, 3, 2 ]
      #25 [ 3, 2, 1, 2, 3 ]
      #26 [ 2, 1, 2, 3, 2 ]
      #27 [ 2, 3, 2, 1, 2 ]
      #28 [ 2, 1, 3, 2, 1 ]
      #31 [ 1, 2, 1, 3, 2 ]
      #32 [ 1, 2, 3, 2, 1 ]
      #33 [ 2, 3, 2, 1, 2, 3 ]
      #34 [ 2, 1, 2, 3, 2, 1 ]
      #39 [ 1, 2, 3, 2, 1, 2 ]
    1.11 = 2211                 in family 1.11 = 2211
      #10 [ 2, 1, 2 ]
      #17 [ 3, 2, 1, 2 ]
      #18 [ 2, 1, 2, 3 ]
      #25 [ 3, 2, 1, 2, 3 ]
```

B4

4.	9
31.	711(11)
3.1	711
.4	531(11,11)
22.	531(2,11)
2.2	531
1.3	441
21.1	522
211.	51111(11)
2.11	51111
11.2	333
.31	33111(11)
1.21	33111
111.1	32211(11)
11.11	32211
.22	22221
1111.	3111111(11)
1.111	3111111
.211	2211111
.1111	111111111

```
total num of chars: 20
total num of families: 10

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    none
chars where some polynomial has both positive and negative coeffs:
    none
chars where some polynomial has strictly negative coeffs:
    1.111 = 3111111              in family 1.111 = 3111111
    2.2 = 531                    in family 2.2 = 531
    11.11 = 32211                in family 11.11 = 32211

| 0 elements where some sequence of nonzero coeffs is not unimodal in abs value.
| 0 elements where some polynomial has both positive and negative coeffs.
| 141 elements where some polynomial has strictly negative coeffs.
    2.2 = 531                    in family 2.2 = 531
      #100 [ 2, 1, 4, 3, 2, 1 ]
      #105 [ 2, 1, 3, 2, 1, 4 ]
      #109 [ 1, 4, 3, 2, 1, 2 ]
      #110 [ 1, 3, 2, 1, 2, 4 ]
      #111 [ 1, 2, 1, 2, 4, 3 ]
      #112 [ 1, 2, 1, 2, 3, 4 ]
      #116 [ 1, 2, 1, 4, 3, 2 ]
      #121 [ 1, 2, 1, 3, 2, 4 ]
      #134 [ 2, 1, 2, 4, 3, 2, 1 ]
      …

      #353 [ 1, 2, 1, 3, 2, 1, 2, 4, 3, 2, 1, 2 ]
      #367 [ 1, 2, 1, 3, 2, 1, 4, 3, 2, 1, 2, 3, 4 ]
    11.11 = 32211                in family 11.11 = 32211
      #47 [ 1, 2, 1, 4 ]
      #76 [ 1, 4, 3, 2, 1 ]
      #78 [ 1, 3, 2, 1, 4 ]
      #80 [ 1, 2, 1, 4, 3 ]
      #84 [ 1, 2, 1, 3, 4 ]
      #120 [ 1, 3, 2, 1, 4, 3 ]
      #147 [ 2, 1, 3, 2, 1, 4, 3 ]
      #162 [ 1, 3, 2, 1, 4, 3, 2 ]
      #191 [ 2, 1, 3, 2, 1, 4, 3, 2 ]
      #235 [ 2, 1, 3, 2, 1, 4, 3, 2, 1 ]
      #252 [ 1, 2, 1, 3, 2, 1, 4, 3, 2 ]
      #292 [ 1, 2, 1, 3, 2, 1, 4, 3, 2, 1 ]
    1.111 = 3111111              in family 1.111 = 3111111
      #27 [ 1, 2, 1 ]
```

C4

4.	8	
.4	62(11)	
3.1	62	⇅,±
1.3	44(11)	
2.2	44	
31.	611	
22.	422(11)	
21.1	422	
.31	4211(11)	
2.11	4211	
11.2	332	
1.21	3311	
.22	2222(11)	
11.11	2222	
211.	41111	
111.1	22211	
.211	221111(11)	
1.111	221111	
1111.	2111111	
.1111	11111111	

```
total num of chars: 20
total num of families: 10

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    3.1 = 62                     in family 3.1 = 62
chars where some polynomial has both positive and negative coeffs:
    3.1 = 62                     in family 3.1 = 62
chars where some polynomial has strictly negative coeffs:
    1.111 = 221111               in family 1.111 = 221111
    3.1 = 62                     in family 3.1 = 62
    11.11 = 2222                 in family 11.11 = 2222
    2.11 = 4211                  in family 2.11 = 4211

| 7 elements where some sequence of nonzero coeffs is not unimodal in abs value.
    3.1 = 62                     in family 3.1 = 62
      #260 [ 3, 2, 1, 2, 3, 4, 3, 2, 1, 2 ]
      #264 [ 2, 1, 2, 3, 4, 3, 2, 1, 2, 3 ]
      #266 [ 2, 1, 2, 3, 2, 1, 2, 4, 3, 2 ]
      #274 [ 2, 3, 2, 1, 2, 4, 3, 2, 1, 2 ]
      #299 [ 3, 2, 1, 2, 3, 4, 3, 2, 1, 2, 3 ]
      #304 [ 2, 1, 2, 3, 2, 4, 3, 2, 1, 2, 3 ]
      #306 [ 2, 3, 2, 1, 2, 3, 4, 3, 2, 1, 2 ]
| 3 elements where some polynomial has both positive and negative coeffs.
    3.1 = 62                     in family 3.1 = 62
      #260 [ 3, 2, 1, 2, 3, 4, 3, 2, 1, 2 ]
      #264 [ 2, 1, 2, 3, 4, 3, 2, 1, 2, 3 ]
      #299 [ 3, 2, 1, 2, 3, 4, 3, 2, 1, 2, 3 ]
| 235 elements where some polynomial has strictly negative coeffs.
    3.1 = 62                     in family 3.1 = 62
      #34 [ 4, 3, 2, 1 ]
      #36 [ 3, 2, 1, 4 ]
      #40 [ 2, 1, 4, 3 ]
      #44 [ 2, 1, 3, 4 ]
      #48 [ 1, 4, 3, 2 ]
      #50 [ 1, 3, 2, 4 ]
      #52 [ 1, 2, 4, 3 ]
      #54 [ 1, 2, 3, 4 ]
      #56 [ 4, 3, 2, 1, 2 ]
      …

      #376 [ 1, 2, 1, 3, 2, 1, 2, 3, 4, 3, 2, 1, 2, 3 ]
      #380 [ 2, 1, 2, 3, 2, 1, 2, 3, 4, 3, 2, 1, 2, 3, 4 ]
    2.11 = 4211                  in family 2.11 = 4211
      #18 [ 3, 2, 1 ]
      #23 [ 2, 1, 3 ]
      #29 [ 1, 3, 2 ]
      #30 [ 1, 2, 3 ]
      #31 [ 3, 2, 1, 2 ]
      …

      #170 [ 3, 4, 3, 2, 1, 2, 3, 4 ]
      #174 [ 3, 2, 1, 2, 3, 4, 3, 2 ]
      #175 [ 3, 2, 4, 3, 2, 1, 2, 3 ]
      #176 [ 3, 2, 1, 2, 4, 3, 2, 1 ]
      #177 [ 2, 4, 3, 2, 1, 2, 3, 4 ]
      #180 [ 2, 1, 2, 3, 4, 3, 2, 1 ]
      #182 [ 2, 3, 2, 1, 2, 3, 4, 3 ]
      #188 [ 2, 3, 4, 3, 2, 1, 2, 3 ]
      #191 [ 2, 1, 3, 2, 1, 4, 3, 2 ]
      #206 [ 1, 3, 2, 1, 4, 3, 2, 1 ]
      #208 [ 1, 2, 1, 3, 2, 1, 4, 3 ]
      #212 [ 1, 2, 3, 4, 3, 2, 1, 2 ]
      #213 [ 1, 2, 3, 2, 1, 2, 4, 3 ]
      #221 [ 3, 2, 4, 3, 2, 1, 2, 3, 4 ]
      #222 [ 3, 2, 1, 2, 3, 4, 3, 2, 1 ]
      #226 [ 2, 3, 4, 3, 2, 1, 2, 3, 4 ]
      #235 [ 2, 1, 3, 2, 1, 4, 3, 2, 1 ]
      #252 [ 1, 2, 1, 3, 2, 1, 4, 3, 2 ]
      #256 [ 1, 2, 3, 4, 3, 2, 1, 2, 3 ]
    11.11 = 2222                 in family 11.11 = 2222
      #32 [ 2, 1, 2, 4 ]
      #56 [ 4, 3, 2, 1, 2 ]
      #57 [ 3, 2, 1, 2, 4 ]
      #58 [ 2, 1, 2, 4, 3 ]
      #59 [ 2, 1, 2, 3, 4 ]
      #90 [ 3, 2, 1, 2, 4, 3 ]
    1.111 = 221111               in family 1.111 = 221111
      #16 [ 2, 1, 2 ]
      #31 [ 3, 2, 1, 2 ]
      #33 [ 2, 1, 2, 3 ]
      #55 [ 3, 2, 1, 2, 3 ]
      #87 [ 4, 3, 2, 1, 2, 3 ]
      #88 [ 3, 2, 1, 2, 3, 4 ]
      #126 [ 4, 3, 2, 1, 2, 3, 4 ]
```

D4

.4	71
1.3	53
.31	5111
2-	44+
2+	44-
11.2	3311(11)
1.21	3311
.22	3221
.211	311111
11-	2222+
11+	2222-
1.111	221111
.1111	11111111

```
total num of chars: 13
total num of families: 11

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    none
chars where some polynomial has both positive and negative coeffs:
    none
chars where some polynomial has strictly negative coeffs:
    1.3 = 53                    in family 1.3 = 53
    1.21 = 3311                 in family 1.21 = 3311

| 0 elements where some sequence of nonzero coeffs is not unimodal in abs value.
| 0 elements where some polynomial has both positive and negative coeffs.
| 73 elements where some polynomial has strictly negative coeffs.
    1.3 = 53                    in family 1.3 = 53
      #32 [ 2, 4, 3, 1 ]
      #34 [ 4, 3, 1, 2 ]
      #37 [ 2, 3, 1, 4 ]
      #40 [ 3, 1, 2, 4 ]
      #46 [ 1, 2, 4, 3 ]
      #49 [ 1, 4, 3, 2 ]
      #52 [ 1, 2, 3, 4 ]
      #53 [ 1, 3, 2, 4 ]
      #54 [ 4, 3, 1, 2, 3 ]
      #55 [ 3, 1, 2, 3, 4 ]
      #58 [ 3, 1, 4, 3, 2 ]
      #59 [ 2, 3, 1, 4, 3 ]
      #60 [ 2, 4, 3, 1, 2 ]
      #61 [ 2, 3, 4, 3, 1 ]
      #62 [ 3, 4, 3, 1, 2 ]
      #63 [ 3, 1, 2, 4, 3 ]
      #64 [ 2, 3, 1, 2, 4 ]
      #67 [ 3, 2, 4, 3, 1 ]
      #70 [ 1, 2, 4, 3, 1 ]
      #72 [ 1, 4, 3, 1, 2 ]
      #75 [ 1, 2, 3, 1, 4 ]
      #76 [ 1, 2, 4, 3, 2 ]
      #77 [ 1, 2, 3, 4, 3 ]
      #78 [ 1, 3, 1, 2, 4 ]
      #79 [ 1, 3, 4, 3, 2 ]
      #80 [ 1, 2, 3, 2, 4 ]
      #81 [ 1, 3, 2, 4, 3 ]
      #82 [ 4, 3, 1, 2, 3, 4 ]
      #86 [ 2, 3, 1, 4, 3, 2 ]
      #88 [ 3, 1, 2, 3, 4, 3 ]
      #89 [ 3, 1, 2, 4, 3, 2 ]
      #90 [ 3, 4, 3, 1, 2, 3 ]
      #91 [ 2, 3, 4, 3, 1, 2 ]
      #92 [ 2, 3, 1, 2, 4, 3 ]
      #93 [ 3, 1, 2, 4, 3, 1 ]
      #103 [ 1, 2, 4, 3, 1, 2 ]
      #104 [ 1, 2, 3, 4, 3, 1 ]
      #105 [ 1, 3, 4, 3, 1, 2 ]
      #106 [ 1, 3, 1, 2, 4, 3 ]
      #107 [ 1, 2, 3, 1, 2, 4 ]
      #108 [ 1, 2, 3, 4, 3, 2 ]
      #109 [ 1, 3, 2, 4, 3, 1 ]
      #113 [ 3, 1, 2, 3, 4, 3, 2 ]
      #115 [ 3, 4, 3, 1, 2, 3, 4 ]
      #118 [ 2, 3, 1, 2, 4, 3, 2 ]
      #119 [ 3, 1, 2, 3, 4, 3, 1 ]
      #120 [ 3, 1, 2, 4, 3, 1, 2 ]
      #121 [ 2, 3, 4, 3, 1, 2, 3 ]
      #133 [ 1, 3, 4, 3, 1, 2, 3 ]
      #134 [ 1, 2, 3, 1, 2, 4, 3 ]
      #135 [ 1, 2, 3, 4, 3, 1, 2 ]
      #136 [ 1, 3, 1, 2, 4, 3, 1 ]
    1.21 = 3311                 in family 1.21 = 3311
      #115 [ 3, 4, 3, 1, 2, 3, 4 ]
      #116 [ 2, 3, 1, 2, 3, 4, 3 ]
      #117 [ 3, 1, 4, 3, 1, 2, 3 ]
      #118 [ 2, 3, 1, 2, 4, 3, 2 ]
      #122 [ 3, 2, 4, 3, 1, 2, 3 ]
      #123 [ 2, 3, 1, 2, 4, 3, 1 ]
      #131 [ 1, 3, 1, 2, 3, 4, 3 ]
      #132 [ 1, 3, 1, 2, 4, 3, 2 ]
      #136 [ 1, 3, 1, 2, 4, 3, 1 ]
      #140 [ 3, 1, 4, 3, 1, 2, 3, 4 ]
      #141 [ 2, 3, 1, 2, 3, 4, 3, 2 ]
      #143 [ 2, 3, 4, 3, 1, 2, 3, 4 ]
      #144 [ 2, 3, 1, 4, 3, 1, 2, 3 ]
      #145 [ 3, 2, 4, 3, 1, 2, 3, 4 ]
      #148 [ 2, 3, 1, 2, 4, 3, 1, 2 ]
      #153 [ 1, 3, 4, 3, 1, 2, 3, 4 ]
      #156 [ 1, 2, 3, 1, 2, 4, 3, 2 ]
      #157 [ 1, 3, 1, 2, 3, 4, 3, 1 ]
      #158 [ 1, 3, 1, 2, 4, 3, 1, 2 ]
      #160 [ 1, 3, 2, 4, 3, 1, 2, 3 ]
      #161 [ 1, 2, 3, 1, 2, 4, 3, 1 ]
      #164 [ 2, 3, 1, 4, 3, 1, 2, 3, 4 ]
      #174 [ 1, 3, 2, 4, 3, 1, 2, 3, 4 ]
      #177 [ 1, 2, 3, 1, 2, 4, 3, 1, 2 ]
```

F4

phi{1,0}	F4	
phi{2,4}'	F4(a1)(11)	
phi{4,1}	F4(a1)	⇅,±
phi{2,4}''	F4(a2)(11)	
phi{9,2}	F4(a2)	⇅,±
phi{8,3}'	C3	
phi{8,3}''	B3	
phi{1,12}'	F4(a3)(211)	
phi{6,6}''	F4(a3)(22)	
phi{9,6}'	F4(a3)(31)	
phi{12,4}	F4(a3)	±
phi{4,7}'	C3(a1)(11)	
phi{16,5}	C3(a1)	
phi{6,6}'	~A2+A1	
phi{4,8}	B2(11)	
phi{9,6}''	B2	
phi{4,7}''	A2+~A1	
phi{8,9}'	~A2	
phi{1,12}''	A2(11)	
phi{8,9}''	A2	
phi{9,10}	A1+~A1	
phi{2,16}'	~A1(11)	
phi{4,13}	~A1	
phi{2,16}''	A1	
phi{1,24}	1	

```
total num of chars: 25
total num of families: 11

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    phi{4,1} = F4(a1)           in family phi{4,1} = F4(a1)
    phi{9,2} = F4(a2)           in family phi{9,2} = F4(a2)
chars where some polynomial has both positive and negative coeffs:
    phi{12,4} = F4(a3)          in family phi{12,4} = F4(a3)
    phi{4,1} = F4(a1)           in family phi{4,1} = F4(a1)
    phi{9,2} = F4(a2)           in family phi{9,2} = F4(a2)
chars where some polynomial has strictly negative coeffs:
    phi{4,1} = F4(a1)           in family phi{4,1} = F4(a1)
    phi{9,2} = F4(a2)           in family phi{9,2} = F4(a2)
    phi{9,6}' = F4(a3)(31)      in family phi{12,4} = F4(a3)
    phi{12,4} = F4(a3)          in family phi{12,4} = F4(a3)
    phi{4,7}' = C3(a1)(11)      in family phi{12,4} = F4(a3)
    phi{16,5} = C3(a1)          in family phi{12,4} = F4(a3)
    phi{6,6}' = ~A2+A1          in family phi{12,4} = F4(a3)
    phi{9,6}'' = B2             in family phi{12,4} = F4(a3)
    phi{4,7}'' = A2+~A1         in family phi{12,4} = F4(a3)
    phi{4,13} = ~A1             in family phi{4,13} = ~A1

| 90 elements where some sequence of nonzero coeffs is not unimodal in abs value.
    phi{4,1} = F4(a1)           in family phi{4,1} = F4(a1)
      #546 [ 3, 2, 1, 3, 2, 4, 3, 2, 1, 3, 2, 4 ]
      #552 [ 2, 1, 3, 2, 4, 3, 2, 1, 3, 2, 4, 3 ]
      #554 [ 3, 2, 4, 3, 2, 1, 3, 2, 4, 3, 2, 1 ]
      #557 [ 2, 1, 3, 2, 1, 3, 4, 3, 2, 1, 3, 4 ]
      #596 [ 1, 3, 2, 1, 3, 4, 3, 2, 1, 3, 2, 4 ]
      #597 [ 1, 2, 1, 3, 4, 3, 2, 1, 3, 2, 4, 3 ]
      #603 [ 1, 3, 2, 4, 3, 2, 1, 3, 2, 4, 3, 2 ]
      #604 [ 1, 2, 1, 3, 2, 1, 3, 4, 3, 2, 3, 4 ]
      #626 [ 3, 2, 1, 3, 2, 3, 4, 3, 2, 1, 3, 2, 4 ]
      …

      #880 [ 1, 2, 3, 2, 4, 3, 2, 1, 3, 2, 3, 4, 3, 2, 3 ]
      #900 [ 2, 1, 3, 2, 1, 3, 2, 4, 3, 2, 1, 3, 2, 4, 3, 2 ]
      #902 [ 3, 2, 1, 3, 2, 4, 3, 2, 1, 3, 2, 3, 4, 3, 2, 3 ]
    phi{9,2} = F4(a2)           in family phi{9,2} = F4(a2)
      #905 [ 2, 3, 2, 1, 3, 2, 3, 4, 3, 2, 1, 3, 2, 4, 3, 2 ]
| 61 elements where some polynomial has both positive and negative coeffs.
    phi{4,1} = F4(a1)           in family phi{4,1} = F4(a1)
      #546 [ 3, 2, 1, 3, 2, 4, 3, 2, 1, 3, 2, 4 ]
      #552 [ 2, 1, 3, 2, 4, 3, 2, 1, 3, 2, 4, 3 ]
      #554 [ 3, 2, 4, 3, 2, 1, 3, 2, 4, 3, 2, 1 ]
      #557 [ 2, 1, 3, 2, 1, 3, 4, 3, 2, 1, 3, 4 ]
      #561 [ 2, 3, 4, 3, 2, 1, 3, 2, 4, 3, 2, 1 ]
      #562 [ 2, 3, 2, 1, 3, 2, 4, 3, 2, 1, 3, 4 ]
      #596 [ 1, 3, 2, 1, 3, 4, 3, 2, 1, 3, 2, 4 ]
      #597 [ 1, 2, 1, 3, 4, 3, 2, 1, 3, 2, 4, 3 ]
      #603 [ 1, 3, 2, 4, 3, 2, 1, 3, 2, 4, 3, 2 ]
      #604 [ 1, 2, 1, 3, 2, 1, 3, 4, 3, 2, 3, 4 ]
      #605 [ 1, 2, 3, 2, 1, 3, 2, 4, 3, 2, 3, 4 ]
      #606 [ 1, 2, 3, 4, 3, 2, 1, 3, 2, 4, 3, 2 ]
      #625 [ 4, 3, 2, 1, 3, 2, 3, 4, 3, 2, 1, 3, 2 ]
      …

      #798 [ 1, 2, 3, 2, 4, 3, 2, 1, 3, 2, 3, 4, 3, 2 ]
      #803 [ 4, 3, 2, 1, 3, 2, 3, 4, 3, 2, 1, 3, 2, 3, 4 ]
      #872 [ 1, 2, 3, 2, 1, 4, 3, 2, 1, 3, 2, 4, 3, 2, 1 ]
      #719 [ 3, 2, 1, 3, 2, 3, 4, 3, 2, 1, 3, 2, 4, 3 ]
      #746 [ 2, 1, 3, 2, 1, 4, 3, 2, 1, 3, 2, 4, 3, 2 ]
      #804 [ 3, 2, 1, 3, 2, 3, 4, 3, 2, 1, 3, 2, 3, 4, 3 ]
      #805 [ 3, 4, 3, 2, 1, 3, 2, 3, 4, 3, 2, 1, 3, 2, 3 ]
      #831 [ 2, 1, 3, 2, 1, 4, 3, 2, 1, 3, 2, 4, 3, 2, 1 ]
      #871 [ 1, 2, 1, 3, 2, 1, 4, 3, 2, 1, 3, 2, 4, 3, 2 ]
      #883 [ 3, 4, 3, 2, 1, 3, 2, 3, 4, 3, 2, 1, 3, 2, 3, 4 ]
      #944 [ 1, 2, 1, 3, 2, 1, 4, 3, 2, 1, 3, 2, 4, 3, 2, 1 ]
    phi{12,4} = F4(a3)          in family phi{12,4} = F4(a3)
      #373 [ 4, 3, 2, 1, 3, 2, 4, 3, 2, 1 ]
      #427 [ 1, 2, 3, 2, 1, 4, 3, 2, 3, 4 ]
| 843 elements where some polynomial has strictly negative coeffs.
    phi{4,1} = F4(a1)           in family phi{4,1} = F4(a1)
      #31 [ 4, 3, 2, 1 ]
      #32 [ 3, 2, 1, 4 ]
      #35 [ 2, 1, 4, 3 ]
      #42 [ 2, 1, 3, 4 ]
      #49 [ 1, 4, 3, 2 ]
      #50 [ 1, 3, 2, 4 ]
      #52 [ 1, 2, 4, 3 ]
      #55 [ 1, 2, 3, 4 ]
      #56 [ 3, 4, 3, 2, 1 ]
      …

      #771 [ 1, 2, 3, 2, 1, 3, 2, 3, 4, 3, 2, 1, 3, 2 ]
      #806 [ 2, 1, 3, 2, 1, 3, 2, 3, 4, 3, 2, 1, 3, 2, 3 ]
      #839 [ 2, 3, 2, 1, 3, 4, 3, 2, 1, 3, 2, 3, 4, 3, 2 ]
      #840 [ 2, 3, 2, 1, 4, 3, 2, 1, 3, 2, 3, 4, 3, 2, 3 ]
      #848 [ 1, 2, 3, 2, 1, 3, 2, 3, 4, 3, 2, 1, 3, 2, 3 ]
    phi{9,2} = F4(a2)           in family phi{9,2} = F4(a2)
      #93 [ 2, 1, 4, 3, 2, 3 ]
      #94 [ 2, 1, 3, 2, 3, 4 ]
      #96 [ 4, 3, 2, 1, 3, 2 ]
      #98 [ 3, 2, 1, 4, 3, 2 ]
      #102 [ 3, 2, 4, 3, 2, 1 ]
      …

      …

    phi{4,13} = ~A1             in family phi{4,13} = ~A1
      #21 [ 3, 2, 3 ]
      #37 [ 4, 3, 2, 3 ]
      #43 [ 3, 2, 3, 4 ]
      #71 [ 4, 3, 2, 3, 4 ]
```

B5

5.	(11)	
41.	911(11)	
4.1	911	
.5	731(11,11)	
32.	731(2,11)	
3.2	731	⇅,±
1.4	551(11)	
2.3	551	
31.1	722	
311.	71111(11)	
3.11	71111	
22.1	533(11)	
21.2	533	
221.	53111(11,11)	
.41	53111(11,2)	
2.21	53111	
11.3	443	
1.31	44111	
211.1	52211(11)	
21.11	52211	
111.2	33311(11)	
11.21	33311	
.32	33221(11)	
1.22	33221	
2111.	5111111(11)	
2.111	5111111	
.311	3311111(11)	
1.211	3311111	
111.11	32222	
1111.1	3221111(11)	
11.111	3221111	
.221	2222111	
11111.	311111111(11)	
1.1111	311111111	
.2111	221111111	
.11111	11111111111	

```
total num of chars: 36
total num of families: 16

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    3.2 = 731                   in family 3.2 = 731
chars where some polynomial has both positive and negative coeffs:
    3.2 = 731                   in family 3.2 = 731
chars where some polynomial has strictly negative coeffs:
    1.1111 = 311111111          in family 1.1111 = 311111111
    3.2 = 731                   in family 3.2 = 731
    21.2 = 533                  in family 21.2 = 533
    2.21 = 53111                in family 2.21 = 53111
    11.21 = 33311               in family 11.21 = 33311
    11.111 = 3221111            in family 11.111 = 3221111

| 173 elements where some sequence of nonzero coeffs is not unimodal in abs value.
    3.2 = 731                   in family 3.2 = 731
      #1927 [ 4, 3, 2, 1, 2, 5, 4, 3, 2, 1, 2, 3, 4 ]
      #1928 [ 3, 2, 1, 2, 5, 4, 3, 2, 1, 2, 3, 4, 5 ]
      #1929 [ 3, 2, 1, 2, 4, 3, 2, 1, 2, 3, 4, 5, 4 ]
      #1938 [ 2, 1, 2, 3, 5, 4, 3, 2, 1, 2, 3, 4, 5 ]
      #1940 [ 2, 1, 2, 4, 3, 5, 4, 3, 2, 1, 2, 3, 4 ]
      #1944 [ 2, 1, 2, 3, 4, 3, 2, 1, 2, 3, 4, 5, 4 ]
      #1968 [ 2, 1, 2, 4, 3, 2, 5, 4, 3, 2, 1, 2, 3 ]
      #2024 [ 2, 3, 2, 1, 2, 3, 4, 3, 5, 4, 3, 2, 1 ]
      #2027 [ 2, 3, 2, 1, 2, 3, 4, 3, 2, 1, 2, 5, 4 ]
      #2059 [ 2, 3, 4, 3, 2, 1, 5, 4, 3, 2, 1, 2, 3 ]
      #2099 [ 1, 3, 4, 3, 2, 1, 2, 5, 4, 3, 2, 1, 2 ]
      #2114 [ 1, 2, 1, 2, 3, 2, 1, 2, 4, 3, 5, 4, 3 ]
      #2123 [ 1, 4, 3, 2, 1, 5, 4, 3, 2, 1, 2, 3, 4 ]
      #2124 [ 1, 3, 2, 1, 5, 4, 3, 2, 1, 2, 3, 4, 5 ]
      #2127 [ 1, 3, 2, 1, 4, 3, 2, 1, 2, 3, 4, 5, 4 ]
      #2152 [ 1, 2, 1, 3, 5, 4, 3, 2, 1, 2, 3, 4, 5 ]
      #2154 [ 1, 2, 1, 4, 3, 5, 4, 3, 2, 1, 2, 3, 4 ]
      #2188 [ 1, 2, 1, 3, 4, 3, 2, 1, 2, 3, 4, 5, 4 ]
      #2196 [ 1, 2, 4, 3, 2, 1, 5, 4, 3, 2, 1, 2, 3 ]
      #2198 [ 1, 2, 3, 2, 1, 2, 3, 4, 3, 2, 1, 5, 4 ]
      #2199 [ 1, 2, 3, 2, 1, 2, 3, 4, 3, 5, 4, 3, 2 ]
      #2243 [ 1, 2, 3, 4, 3, 2, 5, 4, 3, 2, 1, 2, 3 ]
      #2266 [ 4, 3, 2, 1, 2, 5, 4, 3, 2, 1, 2, 3, 4, 5 ]
      …

      #3338 [ 1, 2, 1, 3, 2, 4, 3, 2, 1, 2, 3, 5, 4, 3, 2, 1, 2 ]
      #3357 [ 3, 2, 1, 2, 3, 4, 3, 2, 1, 2, 3, 5, 4, 3, 2, 1, 2, 3 ]
      #3371 [ 2, 1, 2, 3, 2, 1, 2, 4, 3, 2, 1, 2, 5, 4, 3, 2, 1, 2 ]
      #3384 [ 2, 1, 2, 3, 2, 1, 2, 4, 3, 2, 1, 2, 3, 5, 4, 3, 2, 1 ]
      #3520 [ 1, 2, 3, 2, 1, 2, 4, 3, 2, 1, 2, 3, 5, 4, 3, 2, 1, 2 ]
      #3537 [ 2, 1, 2, 3, 2, 1, 2, 4, 3, 2, 1, 2, 3, 5, 4, 3, 2, 1, 2 ]
| 58 elements where some polynomial has both positive and negative coeffs.
    3.2 = 731                   in family 3.2 = 731
      #2348 [ 3, 2, 1, 4, 3, 2, 1, 2, 5, 4, 3, 2, 1, 2 ]
      #2506 [ 1, 2, 1, 2, 3, 2, 1, 2, 4, 3, 2, 5, 4, 3 ]
      #2631 [ 2, 1, 2, 4, 3, 2, 1, 2, 3, 4, 5, 4, 3, 2, 1 ]
      …

      #3136 [ 1, 2, 3, 2, 1, 4, 3, 2, 5, 4, 3, 2, 1, 2, 3, 4 ]
      #3165 [ 3, 2, 1, 2, 3, 4, 3, 2, 1, 5, 4, 3, 2, 1, 2, 3, 4 ]
      #3171 [ 2, 1, 4, 3, 2, 1, 2, 3, 4, 5, 4, 3, 2, 1, 2, 3, 4 ]
      #3187 [ 2, 1, 3, 2, 1, 2, 3, 4, 3, 2, 1, 2, 3, 5, 4, 3, 2 ]
      #3195 [ 2, 1, 2, 3, 2, 1, 4, 3, 2, 5, 4, 3, 2, 1, 2, 3, 4 ]
      #3196 [ 2, 1, 2, 3, 2, 1, 4, 3, 2, 1, 2, 3, 5, 4, 3, 2, 1 ]
      #3208 [ 2, 1, 3, 4, 3, 2, 1, 2, 3, 4, 5, 4, 3, 2, 1, 2, 3 ]
      #3213 [ 2, 1, 3, 2, 1, 2, 3, 4, 3, 2, 5, 4, 3, 2, 1, 2, 3 ]
      #3216 [ 2, 1, 3, 2, 4, 3, 2, 1, 2, 3, 4, 5, 4, 3, 2, 1, 2 ]
      #3219 [ 2, 1, 2, 3, 2, 1, 4, 3, 2, 1, 5, 4, 3, 2, 1, 2, 3 ]
      #3230 [ 2, 1, 3, 2, 4, 3, 2, 1, 2, 3, 5, 4, 3, 2, 1, 2, 3 ]
      #3239 [ 1, 3, 4, 3, 2, 1, 2, 3, 4, 5, 4, 3, 2, 1, 2, 3, 4 ]
      #3266 [ 1, 2, 4, 3, 2, 1, 2, 3, 4, 5, 4, 3, 2, 1, 2, 3, 4 ]
      #3271 [ 1, 3, 2, 1, 2, 3, 4, 3, 2, 5, 4, 3, 2, 1, 2, 3, 4 ]
      #3292 [ 1, 3, 2, 1, 4, 3, 2, 1, 5, 4, 3, 2, 1, 2, 3, 4, 5 ]
      #3306 [ 1, 2, 1, 3, 2, 1, 4, 3, 5, 4, 3, 2, 1, 2, 3, 4, 5 ]
      #3310 [ 1, 2, 1, 3, 2, 1, 2, 3, 4, 3, 2, 5, 4, 3, 2, 1, 2 ]
      #3311 [ 1, 2, 1, 3, 4, 3, 2, 1, 5, 4, 3, 2, 1, 2, 3, 4, 5 ]
      #3317 [ 1, 2, 3, 4, 3, 2, 1, 2, 3, 4, 5, 4, 3, 2, 1, 2, 3 ]
      #3338 [ 1, 2, 1, 3, 2, 4, 3, 2, 1, 2, 3, 5, 4, 3, 2, 1, 2 ]
      #3537 [ 2, 1, 2, 3, 2, 1, 2, 4, 3, 2, 1, 2, 3, 5, 4, 3, 2, 1, 2 ]
| 1742 elements where some polynomial has strictly negative coeffs.
    3.2 = 731                   in family 3.2 = 731
      #369 [ 2, 1, 5, 4, 3, 2, 1 ]
      #371 [ 2, 1, 4, 3, 2, 1, 5 ]
      #389 [ 2, 1, 3, 2, 1, 5, 4 ]
      #408 [ 2, 1, 3, 2, 1, 4, 5 ]
      #415 [ 1, 5, 4, 3, 2, 1, 2 ]
      #416 [ 1, 4, 3, 2, 1, 2, 5 ]
      #418 [ 1, 3, 2, 1, 2, 5, 4 ]
      #421 [ 1, 3, 2, 1, 2, 4, 5 ]
      #423 [ 1, 2, 1, 2, 5, 4, 3 ]
      #424 [ 1, 2, 1, 2, 4, 3, 5 ]
      #425 [ 1, 2, 1, 2, 3, 5, 4 ]
      #427 [ 1, 2, 1, 2, 3, 4, 5 ]
      #442 [ 1, 2, 1, 5, 4, 3, 2 ]
      #444 [ 1, 2, 1, 4, 3, 2, 5 ]
      #462 [ 1, 2, 1, 3, 2, 5, 4 ]
      #476 [ 1, 2, 1, 3, 2, 4, 5 ]
      #522 [ 2, 1, 2, 5, 4, 3, 2, 1 ]
      …

      …

    11.111 = 3221111            in family 11.111 = 3221111
      #92 [ 1, 2, 1, 5 ]
      #93 [ 1, 2, 1, 4 ]
      #166 [ 1, 2, 1, 5, 4 ]
      #167 [ 1, 2, 1, 4, 5 ]
      #170 [ 1, 4, 3, 2, 1 ]
      #175 [ 1, 3, 2, 1, 4 ]
      #179 [ 1, 2, 1, 4, 3 ]
      #186 [ 1, 2, 1, 3, 4 ]
      #301 [ 1, 3, 2, 1, 4, 3 ]
      #393 [ 2, 1, 3, 2, 1, 4, 3 ]
      #456 [ 1, 3, 2, 1, 4, 3, 2 ]
      #575 [ 2, 1, 3, 2, 1, 4, 3, 2 ]
      #801 [ 2, 1, 3, 2, 1, 4, 3, 2, 1 ]
      #907 [ 1, 2, 1, 3, 2, 1, 4, 3, 2 ]
      #1193 [ 1, 2, 1, 3, 2, 1, 4, 3, 2, 1 ]
    1.1111 = 311111111          in family 1.1111 = 311111111
      #46 [ 1, 2, 1 ]
```

C5

5.	(10)	
.5	82(11)	
4.1	82	⇅,±
1.4	64(11)	
3.2	64	⇅,±
41.	811	
2.3	55	
32.	622(11)	
31.1	622	
.41	6211(11)	
3.11	6211	⇅,±
11.3	442(11)	
21.2	442	
1.31	4411(11)	
2.21	4411	
22.1	433	
.32	4222(11)	
21.11	4222	
311.	61111	
1.22	3322(11)	
11.21	3322	
221.	42211(11)	
211.1	42211	
111.2	33211	
.311	421111(11)	
2.111	421111	
1.211	331111	
111.11	22222	
.221	222211(11)	
11.111	222211	
2111.	4111111	
1111.1	2221111	
.2111	22111111(11)	
1.1111	22111111	
11111.	211111111	
.11111	1111111111	

```
total num of chars: 36
total num of families: 16

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    3.11 = 6211                 in family 3.11 = 6211
    4.1 = 82                    in family 4.1 = 82
    3.2 = 64                    in family 3.2 = 64
chars where some polynomial has both positive and negative coeffs:
    3.11 = 6211                 in family 3.11 = 6211
    4.1 = 82                    in family 4.1 = 82
    3.2 = 64                    in family 3.2 = 64
chars where some polynomial has strictly negative coeffs:
    1.1111 = 22111111           in family 1.1111 = 22111111
    4.1 = 82                    in family 4.1 = 82
    3.2 = 64                    in family 3.2 = 64
    3.11 = 6211                 in family 3.11 = 6211
    21.2 = 442                  in family 21.2 = 442
    21.11 = 4222                in family 21.11 = 4222
    11.21 = 3322                in family 11.21 = 3322
    2.111 = 421111              in family 2.111 = 421111
    11.111 = 222211             in family 11.111 = 222211

| 368 elements where some sequence of nonzero coeffs is not unimodal in abs value.
    4.1 = 82                    in family 4.1 = 82
      #1259 [ 3, 2, 1, 2, 3, 5, 4, 3, 2, 1, 2 ]
      #1260 [ 3, 2, 1, 2, 3, 4, 3, 2, 1, 2, 5 ]
      #1261 [ 4, 3, 2, 1, 2, 5, 4, 3, 2, 1, 2 ]
      #1267 [ 3, 2, 1, 2, 4, 5, 4, 3, 2, 1, 2 ]
      #1268 [ 3, 2, 1, 2, 4, 3, 2, 1, 2, 5, 4 ]
      #1277 [ 2, 1, 2, 3, 5, 4, 3, 2, 1, 2, 3 ]
      #1279 [ 2, 1, 2, 4, 3, 2, 1, 2, 5, 4, 3 ]
      #1280 [ 2, 1, 2, 3, 2, 1, 2, 4, 3, 5, 4 ]
      #1281 [ 2, 1, 2, 3, 2, 1, 2, 4, 5, 4, 3 ]
      #1282 [ 2, 1, 2, 3, 4, 3, 2, 1, 2, 3, 5 ]
      #1309 [ 2, 1, 2, 3, 2, 1, 2, 5, 4, 3, 2 ]
      #1311 [ 2, 1, 2, 3, 2, 1, 2, 4, 3, 2, 5 ]
      #1363 [ 2, 3, 2, 1, 2, 5, 4, 3, 2, 1, 2 ]
      #1402 [ 2, 3, 2, 1, 2, 4, 3, 2, 1, 2, 5 ]
      #1582 [ 3, 2, 1, 2, 3, 5, 4, 3, 2, 1, 2, 3 ]
      …

      …

| 165 elements where some polynomial has both positive and negative coeffs.
    4.1 = 82                    in family 4.1 = 82
      #1259 [ 3, 2, 1, 2, 3, 5, 4, 3, 2, 1, 2 ]
      #1260 [ 3, 2, 1, 2, 3, 4, 3, 2, 1, 2, 5 ]
      #1261 [ 4, 3, 2, 1, 2, 5, 4, 3, 2, 1, 2 ]
      #1268 [ 3, 2, 1, 2, 4, 3, 2, 1, 2, 5, 4 ]
      #1277 [ 2, 1, 2, 3, 5, 4, 3, 2, 1, 2, 3 ]
      #1279 [ 2, 1, 2, 4, 3, 2, 1, 2, 5, 4, 3 ]
      #1280 [ 2, 1, 2, 3, 2, 1, 2, 4, 3, 5, 4 ]
      #1282 [ 2, 1, 2, 3, 4, 3, 2, 1, 2, 3, 5 ]
      #1582 [ 3, 2, 1, 2, 3, 5, 4, 3, 2, 1, 2, 3 ]
      …

      …

| 3370 elements where some polynomial has strictly negative coeffs.
    4.1 = 82                    in family 4.1 = 82
      #117 [ 5, 4, 3, 2, 1 ]
      #119 [ 4, 3, 2, 1, 5 ]
      #123 [ 3, 2, 1, 5, 4 ]
      #126 [ 3, 2, 1, 4, 5 ]
      #139 [ 2, 1, 5, 4, 3 ]
      #140 [ 2, 1, 4, 3, 5 ]
      #150 [ 2, 1, 3, 5, 4 ]
      #156 [ 2, 1, 3, 4, 5 ]
      #169 [ 1, 5, 4, 3, 2 ]
      #171 [ 1, 4, 3, 2, 5 ]
      #174 [ 1, 3, 2, 5, 4 ]
      #176 [ 1, 3, 2, 4, 5 ]
      #180 [ 1, 2, 5, 4, 3 ]
      #181 [ 1, 2, 4, 3, 5 ]
      #187 [ 1, 2, 3, 5, 4 ]
      #190 [ 1, 2, 3, 4, 5 ]
      #194 [ 5, 4, 3, 2, 1, 2 ]
      …

      …

    2.111 = 421111              in family 2.111 = 421111
      #30 [ 3, 2, 1 ]
      #39 [ 2, 1, 3 ]
      #49 [ 1, 3, 2 ]
      #50 [ 1, 2, 3 ]
      #52 [ 3, 2, 1, 2 ]
      …

      #1239 [ 1, 2, 3, 4, 5, 4, 3, 2, 1, 2 ]
      #1257 [ 4, 3, 5, 4, 3, 2, 1, 2, 3, 4, 5 ]
      #1263 [ 3, 4, 5, 4, 3, 2, 1, 2, 3, 4, 5 ]
      #1285 [ 4, 3, 2, 1, 2, 3, 4, 5, 4, 3, 2 ]
      #1288 [ 3, 2, 5, 4, 3, 2, 1, 2, 3, 4, 5 ]
      #1325 [ 2, 3, 5, 4, 3, 2, 1, 2, 3, 4, 5 ]
      #1399 [ 2, 3, 4, 5, 4, 3, 2, 1, 2, 3, 4 ]
    11.111 = 222211             in family 11.111 = 222211
      #57 [ 2, 1, 2, 5 ]
      #58 [ 2, 1, 2, 4 ]
      #106 [ 4, 3, 2, 1, 2 ]
      …

      #333 [ 2, 1, 2, 4, 3, 5, 4 ]
      #488 [ 4, 3, 2, 1, 2, 3, 5, 4 ]
      #494 [ 4, 3, 2, 1, 2, 5, 4, 3 ]
      #500 [ 3, 2, 1, 2, 4, 3, 5, 4 ]
    1.1111 = 22111111           in family 1.1111 = 22111111
      #27 [ 2, 1, 2 ]
      #52 [ 3, 2, 1, 2 ]
      #59 [ 2, 1, 2, 3 ]
      #105 [ 3, 2, 1, 2, 3 ]
      #191 [ 4, 3, 2, 1, 2, 3 ]
      #193 [ 3, 2, 1, 2, 3, 4 ]
      #316 [ 4, 3, 2, 1, 2, 3, 4 ]
      #485 [ 5, 4, 3, 2, 1, 2, 3, 4 ]
      #486 [ 4, 3, 2, 1, 2, 3, 4, 5 ]
      #700 [ 5, 4, 3, 2, 1, 2, 3, 4, 5 ]
```

D5

.5	91	
1.4	73	⇅,±
.41	7111	
2.3	55	
11.3	5311(11)	
1.31	5311	⇅,±
2.21	4411	
.32	5221	
1.22	3331	
.311	511111	
11.21	3322	
111.2	331111(11)	
1.211	331111	
.221	322111	
11.111	222211	
.2111	31111111	
1.1111	22111111	
.11111	1111111111	

```
total num of chars: 18
total num of families: 14

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    1.4 = 73                    in family 1.4 = 73
    1.31 = 5311                 in family 1.31 = 5311
chars where some polynomial has both positive and negative coeffs:
    1.4 = 73                    in family 1.4 = 73
    1.31 = 5311                 in family 1.31 = 5311
chars where some polynomial has strictly negative coeffs:
    1.4 = 73                    in family 1.4 = 73
    1.211 = 331111              in family 1.211 = 331111
    11.3 = 5311(11)             in family 1.31 = 5311
    1.31 = 5311                 in family 1.31 = 5311

| 4 elements where some sequence of nonzero coeffs is not unimodal in abs value.
    1.4 = 73                    in family 1.4 = 73
      #1067 [ 4, 3, 1, 2, 3, 5, 4, 3, 1, 2, 3 ]
      #1070 [ 3, 1, 2, 3, 4, 3, 1, 2, 3, 5, 4 ]
    1.31 = 5311                 in family 1.31 = 5311
      #1322 [ 2, 3, 1, 2, 4, 3, 1, 2, 5, 4, 3, 1 ]
      #1438 [ 1, 3, 1, 2, 4, 3, 1, 2, 5, 4, 3, 2 ]
| 12 elements where some polynomial has both positive and negative coeffs.
    1.4 = 73                    in family 1.4 = 73
      #1080 [ 3, 1, 2, 3, 4, 3, 2, 5, 4, 3, 1 ]
      #1088 [ 2, 3, 1, 4, 3, 5, 4, 3, 1, 2, 3 ]
      #1143 [ 3, 1, 2, 3, 4, 3, 1, 5, 4, 3, 2 ]
      #1263 [ 1, 3, 2, 4, 3, 5, 4, 3, 1, 2, 3 ]
    1.31 = 5311                 in family 1.31 = 5311
      #1067 [ 4, 3, 1, 2, 3, 5, 4, 3, 1, 2, 3 ]
      #1070 [ 3, 1, 2, 3, 4, 3, 1, 2, 3, 5, 4 ]
      #1469 [ 2, 3, 1, 4, 3, 1, 2, 3, 4, 5, 4, 3, 1 ]
      #1483 [ 2, 3, 1, 4, 3, 2, 5, 4, 3, 1, 2, 3, 4 ]
      #1590 [ 1, 3, 2, 4, 3, 1, 2, 3, 4, 5, 4, 3, 2 ]
      #1601 [ 1, 3, 2, 4, 3, 1, 5, 4, 3, 1, 2, 3, 4 ]
      #1620 [ 2, 3, 1, 4, 3, 2, 5, 4, 3, 1, 2, 3, 4, 5 ]
      #1716 [ 1, 3, 2, 4, 3, 1, 5, 4, 3, 1, 2, 3, 4, 5 ]
| 1089 elements where some polynomial has strictly negative coeffs.
    1.4 = 73                    in family 1.4 = 73
      #110 [ 2, 5, 4, 3, 1 ]
      #111 [ 2, 4, 3, 1, 5 ]
      #117 [ 5, 4, 3, 1, 2 ]
      #118 [ 4, 3, 1, 2, 5 ]
      #123 [ 2, 3, 1, 5, 4 ]
      #133 [ 3, 1, 2, 5, 4 ]
      #138 [ 2, 3, 1, 4, 5 ]
      #147 [ 3, 1, 2, 4, 5 ]
      #164 [ 1, 2, 5, 4, 3 ]
      #165 [ 1, 2, 4, 3, 5 ]
      #172 [ 1, 5, 4, 3, 2 ]
      #173 [ 1, 4, 3, 2, 5 ]
      #178 [ 1, 2, 3, 5, 4 ]
      #182 [ 1, 3, 2, 5, 4 ]
      #187 [ 1, 2, 3, 4, 5 ]
      #189 [ 1, 3, 2, 4, 5 ]
      #191 [ 5, 4, 3, 1, 2, 3 ]
      …

      #1266 [ 1, 2, 3, 2, 4, 3, 1, 5, 4, 3, 2 ]
      #1282 [ 2, 4, 3, 1, 5, 4, 3, 1, 2, 3, 4, 5 ]
      #1284 [ 3, 1, 4, 3, 5, 4, 3, 1, 2, 3, 4, 5 ]
      #1301 [ 2, 3, 1, 4, 5, 4, 3, 1, 2, 3, 4, 5 ]
      #1337 [ 3, 2, 4, 3, 5, 4, 3, 1, 2, 3, 4, 5 ]
      #1401 [ 1, 4, 3, 2, 5, 4, 3, 1, 2, 3, 4, 5 ]
      #1418 [ 1, 3, 2, 4, 5, 4, 3, 1, 2, 3, 4, 5 ]
    11.3 = 5311(11)             in family 1.31 = 5311
      #56 [ 2, 4, 3, 1 ]
      #61 [ 4, 3, 1, 2 ]
      #66 [ 2, 3, 1, 4 ]
      #75 [ 3, 1, 2, 4 ]
      #94 [ 1, 2, 4, 3 ]
      #98 [ 1, 4, 3, 2 ]
      #102 [ 1, 2, 3, 4 ]
      #103 [ 1, 3, 2, 4 ]
      #105 [ 4, 3, 1, 2, 3 ]
      …

      #829 [ 1, 2, 3, 4, 5, 4, 3, 1, 2 ]
      #886 [ 4, 3, 5, 4, 3, 1, 2, 3, 4, 5 ]
      #911 [ 3, 4, 5, 4, 3, 1, 2, 3, 4, 5 ]
    1.31 = 5311                 in family 1.31 = 5311
      #56 [ 2, 4, 3, 1 ]
      #61 [ 4, 3, 1, 2 ]
      #66 [ 2, 3, 1, 4 ]
      #75 [ 3, 1, 2, 4 ]
      #94 [ 1, 2, 4, 3 ]
      #98 [ 1, 4, 3, 2 ]
      #102 [ 1, 2, 3, 4 ]
      #103 [ 1, 3, 2, 4 ]
      #105 [ 4, 3, 1, 2, 3 ]
      …

      #1868 [ 1, 2, 3, 1, 2, 4, 3, 1, 2, 3, 5, 4, 3, 1, 2, 3 ]
      #1883 [ 1, 2, 3, 1, 2, 3, 4, 3, 1, 2, 3, 5, 4, 3, 1, 2, 3 ]
      #1897 [ 1, 2, 3, 1, 2, 4, 3, 1, 2, 5, 4, 3, 1, 2, 3, 4, 5 ]
    1.211 = 331111              in family 1.211 = 331111
      #332 [ 3, 4, 3, 1, 2, 3, 4 ]
      #336 [ 2, 3, 1, 2, 3, 4, 3 ]
      #337 [ 3, 1, 4, 3, 1, 2, 3 ]
      #340 [ 2, 3, 1, 2, 4, 3, 2 ]
      #361 [ 3, 2, 4, 3, 1, 2, 3 ]
      #364 [ 2, 3, 1, 2, 4, 3, 1 ]
      #414 [ 1, 3, 1, 2, 3, 4, 3 ]
      #418 [ 1, 3, 1, 2, 4, 3, 2 ]
      #439 [ 1, 3, 1, 2, 4, 3, 1 ]
      #473 [ 3, 1, 4, 3, 1, 2, 3, 4 ]
      …

      #1056 [ 1, 3, 2, 4, 3, 1, 5, 4, 3, 2 ]
      #1076 [ 2, 3, 1, 5, 4, 3, 1, 2, 3, 4, 5 ]
      #1210 [ 1, 3, 2, 5, 4, 3, 1, 2, 3, 4, 5 ]
```

B6*

6.	(13)
51.	(11,1,1)(11)
5.1	(11,1,1)
.6	931(11,11)
42.	931(2,11)
4.2	931
1.5	751(11,11)
33.	751(2,11)
3.3	751
41.1	922
411.	91111(11)
4.11	91111
2.4	661
32.1	733(11)
31.2	733
321.	73111(11,11)
.51	73111(11,2)
3.21	73111
11.4	553(11)
21.3	553
1.41	55111(11)
2.31	55111
311.1	72211(11)
31.11	72211
22.2	544
221.1	53311(11,11)
211.2	53311(11,2)
22.11	53311(2,11)
21.21	53311
111.3	44311(11)
11.31	44311
.42	53221(11,11)
222.	53221(2,11)
2.22	53221
3111.	7111111(11)
3.111	7111111
1.32	44221
2211.	5311111(11,11)
.411	5311111(11,2)
2.211	5311111
.33	33331(11)
11.22	33331
211.11	52222
1.311	4411111
2111.1	5221111(11)
21.111	5221111
111.21	33322
1111.2	3331111(11)
11.211	3331111
.321	3322111(11)
1.221	3322111
1111.11	3222211(11)
111.111	3222211
21111.	511111111(11)
2.1111	511111111
.3111	331111111(11)
1.2111	331111111
11111.1	322111111(11)
11.1111	322111111
.222	2222221
.2211	222211111
111111.	31111111111(11)
1.11111	31111111111
.21111	22111111111
.111111	1111111111111

```
total num of chars: 65
total num of families: 26

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    none
chars where some polynomial has both positive and negative coeffs:
    none
chars where some polynomial has strictly negative coeffs:
    2.22 = 53221                in family 21.21 = 53311
    211.2 = 53311(11,2)         in family 21.21 = 53311
    4.2 = 931                   in family 4.2 = 931
    1.5 = 751(11,11)            in family 4.2 = 931
    2.211 = 5311111             in family 2.211 = 5311111
    3.3 = 751                   in family 3.3 = 751
    11.211 = 3331111            in family 11.211 = 3331111
    3.21 = 73111                in family 3.21 = 73111
    111.111 = 3222211           in family 111.111 = 3222211
    11.31 = 44311               in family 21.21 = 53311
    221.1 = 53311(11,11)        in family 21.21 = 53311
    11.1111 = 322111111         in family 11.1111 = 322111111
    21.21 = 53311               in family 21.21 = 53311
    1.11111 = 31111111111       in family 1.11111 = 31111111111

| 0 rationally smooth elements where some sequence of nonzero coeffs is not unimodal in abs value.
| 0 rationally smooth elements where some polynomial has both positive and negative coeffs.
| 658 rationally smooth elements where some polynomial has strictly negative coeffs.
```

C6*

6.	(12)
.6	(10,2)(11)
5.1	(10,2)
1.5	84(11)
4.2	84
51.	(10,1,1)
2.4	66(11)
3.3	66
42.	822(11)
41.1	822
.51	8211(11)
4.11	8211
33.	642(11,11)
11.4	642(2,11)
31.2	642
1.41	6411(11)
3.21	6411
21.3	552
32.1	633
.42	6222(11)
31.11	6222
2.31	5511
411.	81111
22.2	444
1.32	4422(11,11)
2.22	4422(11,2)
11.31	4422(2,11)
21.21	4422
321.	62211(11)
311.1	62211
.33	4332(11)
22.11	4332
111.3	44211(11)
211.2	44211
.411	621111(11)
3.111	621111
221.1	43311
1.311	441111(11)
2.211	441111
11.22	3333
222.	42222(11)
211.11	42222
.321	422211(11)
21.111	422211
111.21	33222
1.221	332211(11)
11.211	332211
3111.	6111111
2211.	4221111(11)
2111.1	4221111
1111.2	3321111
.222	222222(11)
111.111	222222
.3111	42111111(11)
2.1111	42111111
1111.11	2222211
1.2111	33111111
.2211	22221111(11)
11.1111	22221111
21111.	411111111
11111.1	222111111
.21111	2211111111(11)
1.11111	2211111111
111111.	21111111111
.111111	111111111111

```
total num of chars: 65
total num of families: 26

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    none
chars where some polynomial has both positive and negative coeffs:
    none
chars where some polynomial has strictly negative coeffs:
    5.1 = (10,2)                in family 5.1 = (10,2)
    1.5 = 84(11)                in family 4.2 = 84
    4.2 = 84                    in family 4.2 = 84
    4.11 = 8211                 in family 4.11 = 8211
    31.2 = 642                  in family 31.2 = 642
    1.41 = 6411(11)             in family 3.21 = 6411
    3.21 = 6411                 in family 3.21 = 6411
    31.11 = 6222                in family 31.11 = 6222
    11.31 = 4422(2,11)          in family 21.21 = 4422
    21.21 = 4422                in family 21.21 = 4422
    22.11 = 4332                in family 21.21 = 4422
    3.111 = 621111              in family 3.111 = 621111
    221.1 = 43311               in family 21.21 = 4422
    21.111 = 422211             in family 21.111 = 422211
    11.211 = 332211             in family 11.211 = 332211
    111.111 = 222222            in family 111.111 = 222222
    2.1111 = 42111111           in family 2.1111 = 42111111
    11.1111 = 22221111          in family 11.1111 = 22221111
    1.11111 = 2211111111        in family 1.11111 = 2211111111

| 0 rationally smooth elements where some sequence of nonzero coeffs is not unimodal in abs value.
| 0 rationally smooth elements where some polynomial has both positive and negative coeffs.
| 1716 rationally smooth elements where some polynomial has strictly negative coeffs.
```

D6*

.6	(11,1)	
1.5	93	⇅
.51	9111	
2.4	75	⇅,±
11.4	7311(11)	
1.41	7311	⇅,±
3+	66+	
3-	66-	
21.3	5511(11)	
2.31	5511	
.42	7221	
.33	5331(11)	
1.32	5331	
.411	711111	
2.22	4431	
11.31	5322	
111.3	531111(11)	
1.311	531111	
21+	4422+	
21-	4422-	
2.211	441111	
.321	522111	
11.22	3333	
1.221	333111	
111.21	332211(11)	
11.211	332211	
.3111	51111111	
.222	322221	
1111.2	33111111(11)	
1.2111	33111111	
.2211	32211111	
111+	222222+	
111-	222222-	
11.1111	22221111	
.21111	3111111111	
1.11111	2211111111	
.111111	111111111111	

```
total num of chars: 37
total num of families: 27

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    1.5 = 93                    in family 1.5 = 93
    2.4 = 75                    in family 2.4 = 75
    1.41 = 7311                 in family 1.41 = 7311
chars where some polynomial has both positive and negative coeffs:
    2.4 = 75                    in family 2.4 = 75
    1.41 = 7311                 in family 1.41 = 7311
chars where some polynomial has strictly negative coeffs:
    1.5 = 93                    in family 1.5 = 93
    2.4 = 75                    in family 2.4 = 75
    11.4 = 7311(11)             in family 1.41 = 7311
    1.41 = 7311                 in family 1.41 = 7311
    11.31 = 5322                in family 11.31 = 5322
    111.3 = 531111(11)          in family 1.311 = 531111
    1.311 = 531111              in family 1.311 = 531111
    11.211 = 332211             in family 11.211 = 332211
    1.2111 = 33111111           in family 1.2111 = 33111111

| 170 rationally smooth elements where some sequence of nonzero coeffs is not unimodal in abs value.
| 4 rationally smooth elements where some polynomial has both positive and negative coeffs.
| 1148 rationally smooth elements where some polynomial has strictly negative coeffs.
```

E6*

phi{1,0}	E6	
phi{6,1}	E6(a1)	⇅,±
phi{20,2}	D5	
phi{15,5}	E6(a3)(11)	
phi{30,3}	E6(a3)	
phi{15,4}	A5	
phi{64,4}	D5(a1)	
phi{60,5}	A4+A1	
phi{24,6}	D4	
phi{81,6}	A4	
phi{20,10}	D4(a1)(111)	
phi{90,8}	D4(a1)(21)	
phi{80,7}	D4(a1)	
phi{60,8}	A3+A1	
phi{10,9}	2A2+A1	
phi{81,10}	A3	
phi{60,11}	A2+2A1	
phi{24,12}	2A2	
phi{64,13}	A2+A1	
phi{15,17}	A2(11)	
phi{30,15}	A2	
phi{15,16}	3A1	
phi{20,20}	2A1	
phi{6,25}	A1	
phi{1,36}	1	

```
total num of chars: 25
total num of families: 17

chars where some sequence of nonzero coeffs is not unimodal in abs value:
    phi{6,1} = E6(a1)           in family phi{6,1} = E6(a1)
chars where some polynomial has both positive and negative coeffs:
    phi{6,1} = E6(a1)           in family phi{6,1} = E6(a1)
chars where some polynomial has strictly negative coeffs:
    phi{6,1} = E6(a1)           in family phi{6,1} = E6(a1)
    phi{30,3} = E6(a3)          in family phi{30,3} = E6(a3)
    phi{64,4} = D5(a1)          in family phi{64,4} = D5(a1)
    phi{20,10} = D4(a1)(111)    in family phi{80,7} = D4(a1)
    phi{90,8} = D4(a1)(21)      in family phi{80,7} = D4(a1)
    phi{80,7} = D4(a1)          in family phi{80,7} = D4(a1)
    phi{30,15} = A2             in family phi{30,15} = A2

| 34 rationally smooth elements where some sequence of nonzero coeffs is not unimodal in abs value.
| 6 rationally smooth elements where some polynomial has both positive and negative coeffs.
| 1488 rationally smooth elements where some polynomial has strictly negative coeffs.
```