

Shinagawa coefficients for midpoints on Euler Line (1)

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Column 1 shows triangle centers $X(k)$ on the Euler line. Column 2 shows pairs of points $X(i)$ and $X(j)$, represented as (i,j) , such that $X(k)$ is the midpoints of $X(i)$ and $X(j)$, neither of which is on the Euler line. $G(a,b,c)$ and $H(a,b,c)$ are Shinagawa coefficients of $X(k)$, as introduced in Notations and Coordinates near the top of ETC.

Point $X(k)$	(i, j) such that $X(k)=\text{midpoint}(X(i), X(j))$	$G(a, b, c)$	$H(a, b, c)$
X(2)	(1, 3679), (6, 599), (8, 3241), (10, 551), (13, 5463), (14, 5464), (32, 7818), (37, 4688), (39, 9466), (51, 3917), (51, 5650), (69, 1992), (74, 10706), (75, 4664), (76, 7757), (76, 7833), (98, 6054), (99, 671), (110, 9140), (110, 10733), (114, 6055), (115, 2482), (125, 5642), (141, 597), (141, 11178), (147, 11177), (148, 8591), (154, 1853), (165, 1699), (182, 11178), (192, 4740), (193, 11160), (355, 3655), (373, 5650), (385, 7840), (591, 1991), (618, 5459), (619, 5460), (620, 5461), (1125, 3828), (1147, 12359), (1352, 11179), (2487, 4677), (2979, 3060), (2979, 5890), (3054, 3055), (3448, 9143), (3576, 5587), (3654, 3656), (3739, 4755), (3815, 11168), (3817, 10164), (3819, 5943), (5085, 10516), (5309, 7801), (5485, 9741), (5562, 14831), (5569, 8176), (5603, 5657), (5640, 7998), (5790, 10246), (5858, 5859), (5860, 5861), (5862, 5863), (5890, 11459), (5891, 9730), (5892, 10170), (5946, 15067), (6033, 14830), (6776, 11180),	1	0

	(7610, 11184), (7615, 7618), (7617, 7622), (7736, 157271), (7753, 7810), (7788, 14614), (7799, 14568), (7811, 7812), (7817, 7880), (8667, 9766), (8724, 11632), (9167, 14971), (9771, 15597), (9774, 10033), (9778, 9812), (10165, 10175), (10222, 11362), (10519, 14853), (11230, 11231), (11459, 12290), (12164, 12429), (15072, 15305), (15533, 155334)		
X(3)	(1, 40), (6, 1350), (8, 944), (10, 4297), (10, 5731), (13, 5473), (14, 5474), (15, 14538), (16, 14539), (39, 5188), (52, 10625), (54, 7691), (64, 1498) (68, 12118), (69, 6776), (74, 110), (76, 11257), (98, 99), (145, 12245), (146, 12244), (147, 9862), (148, 13172), (154, 10606), (155, 12163), (165, 3576), (182, 3098), (185, 5562), (194, 12251), (195, 12307), (265, 12121), (329, 962), (389, 15644), (399, 10620), (568, 13340), (574, 8722), (616, 6770), (671, 12117), (962, 6361), (1125, 12512), (1147, 7689), (1160, 1161), (1385, 3579), (1482, 12702), (1511, 12041), (2883, 5894), (2888, 12254), (2979, 5890), (3095, 9821), (3357, 6759), (3448, 12383), (3579, 11531), (3654, 3655), (4301, 5493), (5092, 14810), (5603, 9778), (5657, 5731), (5864, 5865), (5876, 13491), (5882, 11362), (5889, 11412), (5891, 14855), (5895, 5925),	1	- 1

	(6101, 6102), (6193, 11411), (6194, 7709), (6225, 12250), (6241, 12111), (7618, 8182), (7751, 7781), (7758, 14023), (7982, 7991), (8591, 12243), (8667, 8716), (8719, 9756), (8724, 14830), (9729, 13348), (9738, 9739), (9740, 9741), (9744, 14907), (9833, 14216), (10575, 12162), (10627, 13630), (10733, 12121), (10990, 15063), (10991, 14981), (11202, 11204), (11362, 5882), (11459, 15072), (12188, 13188), (12278, 12289), (12279, 12290), (12315, 13093), (12317, 14683), (13382, 15606), (13445, 14157), (14094, 15054)		
X(4)	(1, 5691), (8, 962), (13, 5617), (14, 5613), (52, 12162), (64, 5895), (74, 10721), (98, 10722), (99, 10723), (110, 10733), (113, 12295), (125, 13202), (146, 3448), (147, 148), (155, 12293), (185, 11381), (193, 5921), (265, 7728), (355,12699), (389, 13474), (399, 12902), (1539, 10113), (3060,15305), (3632, 11531), (5868, 5869), (5870, 5871), (5876, 10263), (5878, 14216), (5881, 7982), (5889, 12111), (5890, 11455), (5907, 13598), (6033, 6321), (6225, 12324), (6241, 12290), (6288, 15800), (7617, 8176), (7780, 7843), (7991, 9589), (8148, 12645), (11477, 15069), (12164, 12429), (13403, 13419)	0	1
X(5)	(1, 355), (6, 1352), (8, 1482), (10, 946),	1	1

<p>(13, 5617), (14, 5613), (39, 6248), (40, 12699), (51, 5891), (52, 5562), (54, 6288), (64, 5878), (68, 155), (69, 1351), (74, 7728), (76, 3095), (98, 6033), (99, 6321), (110, 265), (113, 125), (114, 115), (141, 5480), (143, 11591), (145, 12645), (146, 10620), (147, 12188), (148, 13188), (182, 3018), (185, 12162), (187, 13449), (193, 11898), (194, 13108), (195, 2888), (316, 2080), (389, 5907), (399, 3448), (568, 11459), (616, 13103), (617, 13102), (618, 5478), (619, 5479), (621, 5611), (622, 5615), (623, 7684), (671, 8724), (962, 12702), (1147, 9927), (1209, 3574), (1216, 5446), (1498, 14216), (1511, 10113), (1539, 12041), (2482, 9880), (2883, 6247), (3519, 15801), 3632, 11531), (3634, 12571), (3656, 3679), (3817, 10175), (4301, 11362), (5448, 5449), (5476, 11178), (5587, 5886), (5603, 5790), (5654, 14852), (5655, 9140), (5874, 5875), (5876, 6102), (5893, 6696), (5946, 15060), (5972, 7687), (6054, 11632), (6101, 10263), (6146, 12134), (6193, 12429), (6225, 13093), (6243, 11412), (7615, 11184), (7617, 8176), (7620, 11165), (7691, 15800), (7694, 9756), (7751, 7759), (7780, 7843), (8148, 12245), (8591, 12355), (9730, 15030), (9955, 9956), (10095, 14128), (10110, 11793), (10272, 11801), (10516, 14561),</p>		
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	(10575, 11381), (10733, 12121), (11017, 12046), (11411, 12164), (11801, 10272), (12118, 12293), (12308, 12317), (12315, 12324), (12316, 12325), (12383, 12902), (13598, 15644), (14643, 14644), (15063, 16003)		
X(20)	(69, 14927), (329, 944), (944, 6361), (1498, 5925), (5894, 6225), (5984, 7779), (6241, 11412), (9862, 13172), (10575, 10625), (12111, 12279), (12244, 12383)	1	- 2
X(23)	(110, 15107)	-E-4F	4E+4F
X(26)	(68, 9833), (1498, 12163)	E+4F	-3E-4F
X(140)	(1, 5690), (8, 1483), (10, 1385), (52, 6101), (69, 1353), (110, 10264), (113, 12041), (114, 12042), (125, 1511), (141, 182), (143, 10627), (185, 5876), (389, 1216), (618, 6771), (620, 6036), (623, 13350), (624, 13349), (946, 3579), (1125, 6684), (1147, 12359), (1153, 7619), (1209, 10610), (2883, 3357), (3098, 5480), (3626, 13607), (3631, 12007), (3819, 5892), (3917, 5946), (3934, 13334), (5188, 14881), (5446, 15644), (5447, 5462), (5449, 12038), (5562, 6102), (5569, 9771), (5609, 16003), (5650, 9730), (5657, 10283), (5972, 6699), (6247, 6759), (6696, 9820), (7610, 12040), (7622, 15597), (7728, 14677), (7764, 7780), (7780, 7764), (9729, 11793), (9730, 15067), (9956, 13624), (10110, 13348), (10164, 11230),	3	- 1

	(10165, 11231), (10222, 11362), (10263, 10625), (11591, 13630), (12162, 13491), (13474, 14641), (13857, 15361)		
X(186)	(74, 14157)	-4F	E+4F
X(376)	(98, 12117), (2487, 7991), (2979, 15072), (5731, 9778), (8591, 11177), (10575, 12162), (10991, 15300), (11455, 12290), (12243, 13172)	2	- 3
X(381)	(51, 15030), (114, 9880), (147, 12243), (265, 5655), (355, 3656), (598, 10033), (671, 6054), (1699, 5587), (1992, 11180), (2487, 5881), (2979, 12290), (3018, 5476), (3060, 11459), (3567, 11444), (3654, 12699), (4301, 4669), (4677, 7982), (5642, 12295), (5657, 9812), (5890, 15305), (6033, 11632), (6321, 8724), (7620, 9770), (9140, 10706), (9143, 12902), (10723, 12117), (11455, 15072), (11477, 15533), (12355, 13188), (15069, 15534)	1	3
X(382)	(5881, 9589), (5889, 12290), (10721, 10733), (10722, 10723),	1	- 5
X(403)	(265, 10540)	-2F	E-2F
X(468)	(110, 3580), (125, 1495)	-3F	E+F
X(546)	(52, 5876), (113, 10113), (125, 1539), (1216, 13598), (1511, 12295), (3018, 5480), (5446, 5907), (5562, 10263), (5690, 12699), (6102, 12162), (6248, 14881), (7728, 10264), (10721, 14677), (11381, 13491), (12041, 13202), (12134, 12370)	1	5

X(547)	(51, 15067), (141, 5476), (597, 11178), (3656, 5690), (3817, 11231), (4669, 10222), (4745, 13464), (5655, 10264), (5790, 10283), (5891, 5946), (5943, 10170), (7615, 12040), (7617, 9771), (7775, 13468), (8176, 15597), 9730, 15060), (10171, 10172), (10175, 11230), (11694, 11801)	7	3
X(548)	(10, 14677), (185, 6101), (1483, 12702), (3579, 4297), (5493, 10222), (5562, 13491), (5609, 10990), (5876, 10575), (5894, 6759), (5907, 14641), (6102, 10625), (10264, 12121)	5	- 7
X(549)	(1, 3654), (40, 3656), (74, 5655), (98, 8724), (99, 11632), (165, 5886), (262, 9774), (568, 2979), (599, 11179), (2482, 6055), (3060, 13340), (3098, 5476), (3632, 3655), (3655, 3679), (3917, 9730), (4669, 5882), (5050, 10519), (5569, 7622), (5657, 10246), (5731, 5790), (6054, 14830), (6321, 12117), (7610, 7618), (8182, 11184), (10164, 10165), (10182, 10193), 12243, 13188), (12355, 13172), (14855, 15030)	5	- 3
X(550)	(64, 9833), (74, 12121), (185, 10625), (329, 1482), (399, 12244), (944, 12702), (1216, 14641), (1482, 6361), (5493, 5882), (5562, 10575), (5878, 5925), (5925, 5878), (6101, 13491), (9821, 11257), (9862, 13188), (10620, 12383), (10991, 10992), (12117, 14830),	3	- 5

	(12118, 13172), (12250, 12315), (12254, 12307), (13348, 15807)		
X(631)	(1698, 7987), (3424, 15428), (10574, 11444)	2	- 1
X(858)	(323, 3448)	E-2F	-2E-2F
X(1003)	(1975, 14614)	$\cot^2(\omega)-2$	3
X(1513)	(147, 385), (2080, 6033)	- 1	$\cot^2(\omega)$
X(1656)	(1968, 8227), (3567, 11444), (3616, 5818), (3617, 10595)	3	1
X(1657)	(11412, 12279)	3	- 7
X(1658)	(6759, 7689)	E+8F	-3E-8F
X(2070)	(3581, 10540)	-E-8F	5E+8F
X(2071)	(110, 13445)	E-4F	-2E+4F
X(2072)	(125, 1568), (13399, 15063)	E-4F	-E-4F
X(3090)	(3624, 7989), (7751, 7759), (7999, 9781)	2	1
X(3091)	(10574, 11439)	1	2
X(3525)	(329, 8227)	4	- 1
X(3526)	(9588, 9624)	5	- 1
X(3530)	(143, 15644), (389, 10627), (1216, 13630), (3060, 11455), (3579, 5901), (3589, 14810), (5447, 9729), (5462, 13348), (5890, 11455), (6684, 13624), (6696, 10282), (9955, 12512), (10272, 12041), (10625, 14449)	7	- 5
X(3534)	(329, 3241), (3241, 6361), (8591, 9862), (9143, 12244), (10264, 10706), (11177, 13172), (11180, 14927)	5	- 9
X(3543)	(4677, 9589)	1	- 6
X(3575)	(5889, 14516)	- F	E+3F
X(3627)	(52, 11381), (146, 12902), (265, 10721), (5691, 12699), (5895, 14216), (6033, 10723), (6321, 10722), (6243, 12111), (7728, 10733),	1	- 7

	(12295, 13202), (13474, 13598)		
X(3628)	(10, 5901), (125, 10272), (143, 1216), (389, 11591), (1125, 9956), (1209, 8254), (1511, 11801), (3631, 5097), (3819, 13364), (3917,13451), (3934, 11272), (5446, 10627), (5447, 10110), (5449, 9820), (5462, 11793), (5907, 13630), (6101, 14449), (6684, 9955), (6721, 6722), (6723, 12900), (10170, 13363), (12006, 14128)	5	1
X(3830)	(671, 10722), (3060, 11455), (5890, 11455), (6054, 10723), (9140, 10721), (10706, 10733), (11381, 14831)	1	- 9
X(3832)	(9780, 10248)	1	4
X(3839)	(11693, 12295)	1	6
X(3843)	(3567, 11439)	1	7
X(3845)	(265, 10706)}, (568, 15305), (671, 6033), (1351, 11180), (3655, 5691), (3679, 12699), (5642, 12295), (6054, 6321), (5790, 9812), (7728, 9140), (9143, 12902), (10722, 14830), (12162, 14831)	1	9
X(3850)	(113, 11801), (143, 5907), (5446, 11591), (5562, 14449), (10113, 10272), (10627, 13598), (13419, 13470), (13451, 15060)	3	7
X(3853)	(1539, 12295), (5446, 13474), (6102, 11381), (10113, 13202), (10263, 12162), (10264, 10721), (12897, 13419)	1	- 11
X(3860)	(13451, 15030)	7	27
X(3861)	(1539, 11801), (5876, 14449),	1	13

	(10272, 12295), (11591, 13598), (13474, 13630)		
X(5025)	(6179, 7860)	$\cot^2(\omega)-1$	- 2
X(5055)	(10164, 10165)	5	3
X(5066)	(51, 15060), (597, 3018), (1353, 11180), (1531, 15361), (5480, 11178), (5642, 10113), (5876, 14831), (5946, 15030), (9466, 14881), (10264, 10706)	5	9
X(5068)	(8, 11522)	3	4
X(5159)	(125, 11064)	E-5F	-E-F
X(5498)	(12038, 13561)	-E+24F	3E-8F
X(5899)	(14157, 15107)	-3E-8F	11E+9F
X(5999)	(5984, 7779)	$\cot^2(\omega)-1$	$-2\cot^2(\omega)$
X(6240)	(5889, 12278)	-2F	E+6F
X(6656)	(7760, 7768), (7765, 7794), (7827, 7883)	$\cot^2(\omega)$	- 1
X(6676)	(185, 343)	E+3F	-E -F
X(6756)	(52, 12134), (389, 13419)	-F	2E+3F
X(7426)	(110, 15360), (3581, 5655)	-E-10F	6E+6F
X(7575)	(110, 3581), (10620, 12112)	-E-16F	7E+16F
X(7807)	(6179, 7796), (7755, 7863)	$\cot^2(\omega)-2$	1
X(7833)	(7756, 7810), (7757, 11057)	$\cot^2(\omega)+3$	- 6
X(7841)	(7748, 7801), (7817, 7842), (7818, 11648)	$\cot^2(\omega)$	- 3
X(7866)	(7869, 7902)	$2\cot^2(\omega)-1$	- 1
X(7876)	(7878, 7936)	$3\cot^2(\omega)+1$	- 2
X(8352)	(148, 7840), (316, 671)	$\cot^2(\omega)$	- 9
X(8354)	(7750, 7757), (7756, 9466)	$2\cot^2(\omega)+5$	- 9
X(8355)	(625, 5461), (671, 6390)	$4\cot^2(\omega)-9$	- 9
X(8356)	(7757, 7811), (7812, 11057), (7823, 14976)	$\cot^2(\omega)+2$	- 3
X(8357)	(7765, 7873)	$2\cot^2(\omega)+1$	- 5
X(8358)	(7757, 7767)	$4\cot^2(\omega)+7$	- 9
X(8359)	(39, 7810), (7750, 7812)	$2\cot^2(\omega)+3$	- 3

X(8360)	(626, 7817), (5254, 7801), (5306, 7818)	$4\cot^2(\omega)-3$	- 3
X(8361)	(7755, 7821)	$2\cot^2(\omega)-3$	- 1
X(8362)	(7772, 7854)	$2\cot^2(\omega)+1$	- 1
X(8363)	(7856, 7922)	$3\cot^2(\omega)-2$	- 1
X(8364)	(7829, 7849)	$4\cot^2(\omega)-1$	- 1
X(8365)	(5305, 7801), (7789, 7817)	$8\cot^2(\omega)-9$	3
X(8366)	(5346, 7801)	$5\cot^2(\omega)-6$	3
X(8367)	(7745, 7810), (7767, 7812), (9300, 9466)	$4\cot^2(\omega)+3$	3
X(8368)	(3933, 14614), (5306, 7801)	$4\cot^2(\omega)-5$	3
X(8369)	(32, 7801), (7816, 7817)	$2\cot^2(\omega)-3$	3
X(8370)	(76, 7812), (9466, 14537)	$\cot^2(\omega)$	3
X(8597)	(7779, 8596)	$\cot^2(\omega)+3$	- 18
X(8598)	(385, 8591), (2482, 6781), (7840, 14712)	$\cot^2(\omega)-6$	9
X(8703)	(40, 3655), (99, 14830), (1350, 11179), (3241, 12702), (3917, 14855), (5890, 13340), (7757, 9812), (8591, 12188), (9140, 12121), (9143, 10620), (9778, 10246), (10625, 14831), (11177, 13188), (11632, 12117)	7	- 9
X(9825)	(5907, 13568)	E-F	E+3F
X(10011)	(114, 230)	$\cot^2(\omega)-4$	$\cot^2(\omega)$
X(10020)	(156, 12359), (5449, 10282)	E+12F	-3E-4F
X(10096)	(10264, 14157)	-E-24F	11E+8F
X(10109)	(3828, 9955), (5642, 11801), (10170, 13364), (13451, 15067)	13	9
X(10124)	(125, 11694), (3819, 13363), (4745, 15178), (5650, 5946)	17	- 3
X(10125)	(10282, 13561)	E+24F	-3E-8F
X(10201)	(154, 14852)	E+8F	-3E
X(10204)	(12083, 13561)	-E+24F	3E-8F
X(10226)	(156, 3357)	-E+16F	3E-16F
X(10257)	(6699, 14156)	E-6F	-E+2F
X(10295)	(3581, 12121), (12112, 12244)	-6F	E+10F

X(10297)	(125, 1531), (10564, 12295)	E-2F	-E-10F
X(10691)	(2979, 11245)	3E+F	-3E-3F
X(11539)	(125, 11693), (165, 2487), (10519, 14848)	13	- 3
X(11250)	(1147, 3357), (7689, 13346)	-E+8F	3E-8F
X(11676)	(9301, 13188)	- 2	$\cot^2(\omega)+3$
X(11737)	(5891, 13451), (10113, 11694)	11	15
X(11799)	(125, 1533), (3448, 12112), (3581, 7728), (10706, 15360)	-E-4F	5E-4F
X(11812)	(3828, 13624)	19	- 9
X(11819)	(6243, 14516)	-E-4F	7E+12F
X(12084)	(64, 155), (3357, 13346), (12118, 14216)	-E+4F	3E-4F
X(12085)	(6193, 12324), (12164, 13093)	-E+2F	3E-2F
X(12100)	(551, 3579), (597, 3098), (3655, 5690) (2482, 12042), (5642, 12041), (5650, 13855), (6101, 14831), (8182, 12040), (10168, 14810), (10192, 11204), (10564, 15361), (10706, 14677), (14855, 15060)	11	- 9
X(12102)	(143, 13474), (11801, 13202), (12162, 14449)	1	- 19
X(12103)	(329, 1483), (1483, 6361), (6101, 10575), (10625, 13491), (12121, 14677), (14641, 15644)	7	- 13
X(12108)	(5447, 12006), (10095, 13348)	13	- 7
X(12225)	(11412, 12289)	E+2F	-2E-6F
X(12362)	(5562, 6146), (6101, 12370), (11750, 12134), (11591, 13470) (13403, 15644)	E+F	-E-3F
X(12605)	(11750, 12162), (12289, 14516)	E+2F	-E-6F
X(12811)	(10110, 14128), (10113, 13392), (13393, 15063)	7	11
X(13371)	(9927, 13346)	-E+4F	3E+4F
X(13383)	(2883, 7689), (6759, 12359)	E+6F	-3E-2F

X(13406)	(156, 9927)	E+8F	-3E+8F
X(13488)	(6146, 11381), (13403, 13474)	F	2E-3F
X(14041)	(316, 14568), (671, 7809)	$\cot^2(\omega)-1$	- 6
X(14891)	(11694, 12041)	23	- 21
X(14892)	(10113, 11693)	17	21
X(15331)	(156, 7689)	E+16F	-3E-16F
X(15646)	(74, 10540)	E-16F	E+16F
X(15761)	(2883, 12359), (6759, 9927)	E+4F	-3E+4F
	(64, 12118)	-E+6F	3E-10F
	(68, 1498), (5878, 12163), (9833, 12293)	E+2F	-3E+2F
	(68, 5878), (1498, 12293), (5895, 12163)	E	-3E+8F
	(68, 5895), (5878, 12293)	E-2F	-3E+14F
	(113, 10113)	E-8F	5E-40F
	(113, 15361)	-E-64F	27E
	(125, 1514)	-3F	2E-7F
	(125, 10564)	3E-12F	-5E+4F
	(125, 13857)	2E-7F	-3E-3F
	(143, 10170)	21E	13E+4F
	(143, 13419), (12134, 14449)	-E-8F	19E+24F
	(155, 5925)	-E+8F	3E-16F
	(155, 14216)	-E+2F	3E+2F
	(156, 5894)	-E+20F	3E-28F
	(156, 6247), (6696, 9820)	-E+12F	3E-4F
	(185, 12134)	E-2F	E+6F
	(265, 14157)	-E-8F	7E-8F
	(323, 10620)	5E-16F	-11E+16F
	(323, 12244)	3E-12F	-7E+20F
	(323, 12902)	3E	-5E-32F
	(389, 10170)	6E	E+F
	{1147, 5894}	-E+10F	3E-14F
	(1147, 6247)	-E+6F	3E-2F
	(1216, 12241), (5562, 13292), (6101, 13142)	3E+2F	-E-6F

(1216, 13403), (5562, 12370), (5876, 6146), (5976, 6146), (12897, 15644)	3E+4F	-E-12F
(1216, 13470)	9E+8F	-11E-24F
(1216, 13568)	3E-2F	-E+6F
(1495, 10113)	-E-16F	11E-16F
(1495, 11801)	-E-40F	19E-8F
(1495, 12041)	E-32F	5E+32F
(1495, 15361)	-7E-88F	45E+72F
(1495, 12295), (3580, 7728)	-E-4F	7E-20F
(1498, 12163)	E+4F	-3E-4F
(1511, 15361)	E-44F	9E+36F
(1514, 10113)	-E-4F	11E-52F
(1514, 11801)	-E-16F	19E-80F
(1514, 12041)	E-20F	5E-4F
(1514, 12295)	-E+2F	7E-38F
(1514, 15361)	-7E-52F	45E-36F
(1531, 10113)	3E	-E-64F
(1531, 11801)	7E-8F	-5E-104F
(1531, 12041), (10113, 10564)	5E-16F	-7E-16F
(1531, 12295)	E+4F	E-44F
(1533, 10113)	-5E-8F	23E-40F
(1533, 11801)	-9E-24F	43E-56F
(1533, 12041)	-3E-24F	17E+8F
(1533, 12295), (3581, 10721)	-3E	13E-32F
(1533, 15361)	-19E-64F	81E
(1539, 15361), (3580, 10706)	-E-10F	9E-18F
(1568, 10113)	3E-8F	-E-40F
(1568, 11801)	7E-24F	-5E-56F
(1568, 12041), (5609, 13399)	5E-24F	-7E+8F
(1568, 12295)	E	E-32F
(1568, 15361)	5E-64F	9E
(1853, 5654)	-E+6F	3E+6F

	(2883, 9927)	E+2F	-3E+10F
	(2979, 12022)	3E+2F	-3E-6F
	(3292, 10990)	E-5F	-2E+7F
	(3292, 13393)	23E-88F	-37E+8F
	(3292, 13399)	E-3F	-2E+F
	(3292, 16003)	3E-12F	-5E+4F
	(3580, 5655)	-E-28F	15E-12F
	(3580, 10540)	-E-12F	7E+4F
	(3580, 10721)	-E+2F	5E-22F
	(3580, 12121)	E-20F	E+28F
	(3580, 14157)	-E-6F	5E+2F
	(3581, 10706), (5655, 15360)	-5E-32F	27E
	(3581, 14157)	-3E-16F	13E+16F
	(5446, 13419), (10263, 12134)	-E-4F	11E+12F
	(5447, 11745)	5E-2F	E+6F
	(5447, 15807)	11E+8F	-E-24F
	(5448, 6696)	-E+10F	3E+2F
	(5448, 13561)	-E+16F	3E+16F
	(5449, 5893)	E+6F	-3E+14F
	(5562, 11225)	4E+2F	-E-6F
	(5562, 11750)	3E+4F	-5E-12F
	(5562, 13142), (5876, 13292), (5907, 12241), (14128, 15807)	E+F	E-3F
	(5642, 15361)	E-80F	21E+48F
	(5654, 10606)	-E+10F	3E-6F
	(5655, 13445)	11E-40F	-21E+24F
	(5655, 15107)	-13E-40F	51E+24F
	(5876, 11225)	11E+8F	11E-24F
	(5876, 11750)	5E+8F	-7E-24F
	(1216, 12897), (5876, 12370), (5907, 13403), (6146, 12162)	E+2F	E-6F
	(5876, 13142), (12162, 13292)	E+2F	5E-6F
	(5893, 13561)	E+12F	-3E+28F

	(5894, 13346)	-E+5F	3E-7F
	(5895, 12293)	E-4F	-3E+20F
	(5907, 12897), (12162, 12370)	E+4F	5E-12F
	(5907, 13470), (10627, 13403)	7E+8F	-5E-24F
	(5925, 12118)	-E+10F	3E-22F
	(6101, 6146), (10625, 12370), (10627, 13470)	5E+4F	-7E-12F
	(6101, 11225)	21E+8F	-19E-24F
	(6101,11750)	7E+8F	-13E-24F
	(6101, 13292), (10625, 13142), (12241, 15644)	2E+F	-2E-3F
	(6146, 10625)	3E+2F	-5E-6F
	(6102, 12134)	E-4F	5E+12F
	(6193, 12250)	-E+4F	3E-8F
	(6193, 13093), (12164, 12250)	-E+3F	3E-5F
	(6225, 11411), (12315, 12429)	E	-3E+4F
	(6225, 12429)	E-F	-3E+7F
	(6241, 12278)	E-4F	-E+12F
	(6241, 14516)	E-2F	-E+6F
	(6243, 12278)	-E-8F	7E+24F
	(6247, 13346)	-E+3F	3E-F
	(6696, 12038)	-E+14F	3E-10F
	(6699, 15448)	E-26F	5E+14F
	(6759, 7689)	E+8F	-3E-8F
	(6759, 12359)	E+6F	-3E
	(7687, 14156)	3E-16F	-E-16F
	(7687, 15448)	-9F	4E-5F
	(7728, 13445)	3E-8F	-5E-8F
	(7728, 15107)	-5E-8F	19E-8F
	(7728, 15360)	-7E-16F	33E-48F
	(9140, 10540)	E-32F	9E
	(9140, 14157)	-E-16F	9E
	(9820, 13561)	-E+20F	3E+4F

	(9833, 12163)	E+6F	-3E-10F
	(10113, 11064)	3E-12F	-E-28F
	(10113, 13857)	13E-32F	-15E-96F
	(10170, 12241)	6E+3F	E-8F
	(10170, 13403)	6E+6F	E-17F
	(10170, 13568)	6E-3F	E+10F
	(10170, 13630)	27E	-5E+4F
	(10170, 13598)	3E	10E+F
	(10264, 10540)	E-24F	5E+8F
	(10272, 15361)	E-152F	45E+72F
	(10540, 10733)	-E	7E-32F
	(10540, 13445)	3E-16F	-5E+16F
	(10540, 14677)	3E-40F	-E+56F
	(10540, 15107)	-5E-16F	19E+16F
	(10540, 15360)	-7E-40F	33E+24F
	(10564, 11801)	11E-40F	-17E-8F
	(10564, 12041)	7E-32F	-13E+32F
	(10575, 12134)	E-F	-E+3F
	(10625, 11225)	13E+4F	-17E-12F
	(10625, 11750)	E+F	-2E-3F
	(10625, 13292)	5E+2F	-7E-6F
	(10627, 12241)	7E+4F	-5E-12F
	(10627, 12897), (11591, 13403)	5E+8F	E-24F
	(10627, 13568)	7E-4F	-5E+12F
	(10706, 13445)	5E-16F	-9E
	(10706, 15107)	-7E-16F	27E
	(10721, 13445)	E	-E-16F
	(10721, 15107)	-3E	11E-16F
	(10721, 15360)	-5E+4F	21E-60F
	(10733, 14157)	- E	5E-16F
	(11064, 11801)	7E-32F	-5E-32F
	(11064, 12041)	5E-28F	-7E+20F
	(11064, 12295)	E-2F	E-26F

	(11064, 15361)	5E-76F	9E+36F
	(11225, 11381)	-E+2F	14E-6F
	(11225, 12134)	3E-6F	13E+18F
	(11225, 12162)	3E+4F	13E-12F
	(11245, 11455)	F	6E-3F
	(11245, 11459)	2E+F	-3F
	(11245, 13340)	7E+2F	-9E-6F
	(11245, 15305)	E+F	3E-3F
	(11381, 11750)	E+4F	E-12F
	(11381, 12370)	-E+4F	11E-12F
	(11381, 13142)	-E+F	7E-3F
	(11381, 13292)	-E+2F	11E-6F
	(11411, 12315)	E+F	-3E+F
	(11412, 12289)	E+2F	-2E-6F
	(11455, 12022)	F	3E-3F
	(11459, 12022)	E+F	-3F
	(11565, 15606)	19E+16F	-25E-48F
	(11591, 12241)	5E+4F	E-12F
	(11591, 12897), (13470, 13474)	3E+8F	7E-24F
	(11591, 13568)	5E-4F	E+12F
	(11693, 15361)	5E-256F	57E+192F
	(11694, 15361)	E-56F	13E+40F
	(11745, 11793)	2E-F	2E+3F
	(11745, 13348)	3E-F	-E+3F
	(11745, 14128)	7E-4F	11E+12F
	(11793, 15807)	9E+8F	5E-24F
	(11801, 13857)	29E-88F	-39E-120F
	(12022, 13340)	7E+4F	-9E-12F
	(12022, 15305)	E+2F	3E-6F
	(12041, 13857)	19E-80F	-33E+48F
	(12111, 12289)	E+4F	-E-12F
	(12112, 12902)	-3E	13E-32F
	(12121, 13445)	5E-24F	-11E+40F

	(12121, 15107)	-3E-24F	13E+40F
	(12121, 15360)	-E-64F	15E+96F
	(12134, 13142), (12241, 13419), (13474, 13568)	-F	4E+3F
	(12134, 13292)	E-2F	5E+6F
	(12134, 13491), (13419, 14641)	3E-4F	-E+12F
	(12134, 14831)	E-6F	9E+18F
	(12162, 13142), (12241, 13474)	F	4E-3F
	(12164, 12324)	-E+F	3E+F
	(12278, 12279)	E-2F	-2E+6F
	(12279, 14516)	E-F	-2E+3F
	(12289, 12290)	2F	E-6F
	(12295, 13857)	5E-7F	-3E-84F
	(12359, 13346)	-E+6F	3E-2F
	(12897, 13474)	-E+4F	11E-12F
	(13202, 15361)	-7E-16F	45E-144F
	(13348, 15807)	13E+8F	-7E-24F
	(13392, 15361)	5E-328F	81E+216F
	(13419, 13568)	-3F	4E+9F
	(13419, 13598)	-E-2F	7E+6F
	(13419, 13630)	E-8F	13E+24F
	(13470, 15644)	11E+8F	-17E-24F
	(13568, 15644)	2E-F	-2E+3F
	(14157, 14677)	E-40F	5E+56F
	(14157, 15360)	-5E-20F	21E+12F
	(14643, 15362)	E-44F	15E-12F
	(316, 10723)	1	$\cot^2(\omega)-6$
	(325, 10723)	1	$2\cot^2(\omega)-9$
	(7779, 10723)	1	$3\cot^2(\omega)-12$
	(6390, 10723)	1	$4\cot^2(\omega)-15$
	(147, 14712)	2	$-\cot^2(\omega)-3$
	(7809, 10723)	2	$3\cot^2(\omega)-15$
	(11257, 14458)	2	$3\cot^2(\omega)-3$

(5569, 9734)	$\cot^2(\omega)-33$	$-3\cot^2(\omega)+27$
(9734, 15597)	$\cot^2(\omega)-30$	$-3\cot^2(\omega)+18$
(7617, 9734)	$\cot^2(\omega)-27$	$-3\cot^2(\omega)+9$
(8591, 9301)	$\cot^2(\omega)-27$	$9\cot^2(\omega)+45$
(7775, 10104)	$\cot^2(\omega)-15$	$-3\cot^2(\omega)-3$
(2080, 6054), (7840, 9301)	$\cot^2(\omega)-15$	$9\cot^2(\omega)+9$
(9301, 13172), (13188, 14712)	$\cot^2(\omega)-11$	$\cot^2(\omega)+21$
(9737, 13468)	$\cot^2(\omega)-10$	$-3\cot^2(\omega)+6$
(8591, 14712)	$\cot^2(\omega)-9$	18
(14639, 15561)	$\cot^2(\omega)-9$	$3\cot^2(\omega)-9$
(2080, 8724)	$\cot^2(\omega)-9$	$3\cot^2(\omega)+9$
(9737, 10104)	$\cot^2(\omega)-7$	$-3\cot^2(\omega)+5$
(13172, 14712)	$\cot^2(\omega)-7$	$-\cot^2(\omega)+15$
(99, 2080), (114, 6781), (385, 13188)	$\cot^2(\omega)-7$	$\cot^2(\omega)+9$
(6033, 14568)	$\cot^2(\omega)-7$	$9\cot^2(\omega)-15$
(9756, 11184)	$\cot^2(\omega)-6$	$-3\cot^2(\omega)$
(187, 2482)	$\cot^2(\omega)-6$	6
(2080, 6390)	$\cot^2(\omega)-6$	$\cot^2(\omega)+6$
(385, 13172)	$\cot^2(\omega)-5$	$-\cot^2(\omega)+9$
(671, 8724)	$\cot^2(\omega)-5$	$\cot^2(\omega)-3$
(114, 187), (325, 2080), (6781, 13449)	$\cot^2(\omega)-5$	$\cot^2(\omega)+3$
(6054, 14568)	$\cot^2(\omega)-5$	$3\cot^2(\omega)-3$
(99, 14568)	$\cot^2(\omega)-4$	3
(147, 12355)	$\cot^2(\omega)-3$	$-15\cot^2(\omega)+21$
(7757, 14458)	$\cot^2(\omega)-3$	$-9\cot^2(\omega)+3$
(6033, 10723)	$\cot^2(\omega)-3$	$-7\cot^2(\omega)+21$
(7823, 13108)	$\cot^2(\omega)-3$	$\cot^2(\omega)+13$
(98, 325)	$\cot^2(\omega)-2$	$-\cot^2(\omega)$
(671, 7799), (7809, 14568)	$\cot^2(\omega)-2$	- 3
(230, 13449), (6321, 6390)	$\cot^2(\omega)-2$	$\cot^2(\omega)-6$
(7812, 14458)	$\cot^2(\omega)-1$	$-9\cot^2(\omega)-3$
(10722, 14568)	$\cot^2(\omega)-1$	$-9\cot^2(\omega)+21$
(98, 316), (7840, 12243)	$\cot^2(\omega)-1$	$-\cot^2(\omega)-3$

(7823, 12251)	$\cot^2(\omega)-1$	$-\cot^2(\omega)+5$
(115, 13449), (325, 6321)	$\cot^2(\omega)-1$	$\cot^2(\omega)-9$
(147, 385)	$\cot^2(\omega)-1$	$\cot^2(\omega)$
(7762, 13108)	$\cot^2(\omega)-1$	$\cot^2(\omega)+7$
(5188, 7747), (7762, 12251)	$\cot^2(\omega)$	$-\cot^2(\omega)+2$
(7765, 7794)	$\cot^2(\omega)$	- 1
(147, 148)	$\cot^2(\omega)$	$\cot^2(\omega)-3$
(6248, 7745)	$\cot^2(\omega)$	$\cot^2(\omega)+4$
(9880, 13449)	$\cot^2(\omega)$	$3\cot^2(\omega)-18$
(2080, 10722)	$\cot^2(\omega)+1$	$-7\cot^2(\omega)+9$
(9744, 11185)	$\cot^2(\omega)+1$	$-\cot^2(\omega)+3$
(316, 6321), (7840, 12355)	$\cot^2(\omega)+1$	$\cot^2(\omega)-15$
(76, 3095)	$\cot^2(\omega)+1$	$\cot^2(\omega)+2$
(183, 9744)	$\cot^2(\omega)+2$	$\cot^2(\omega)$
(5188, 7756), (7750, 11257)	$\cot^2(\omega)+2$	$-\cot^2(\omega)-4$
(5475, 8722)	$\cot^2(\omega)+2$	$-\cot^2(\omega)$
(3095, 7767)	$\cot^2(\omega)+2$	$\cot^2(\omega)-2$
(3095, 7750), (6248, 7756)	$\cot^2(\omega)+3$	$\cot^2(\omega)-5$
(262, 10033), (7837, 14976)	$\cot^2(\omega)+3$	$6\cot^2(\omega)$
(7615, 7694)	$\cot^2(\omega)+3$	$-3\cot^2(\omega)+9$
(147, 9301)	$\cot^2(\omega)+5$	$-7\cot^2(\omega)-3$
(7811, 7833)	$\cot^2(\omega)+5$	- 6
(3095, 7802)	$\cot^2(\omega)+5$	$\cot^2(\omega)-10$
(7768, 7883)	$\cot^2(\omega)+6$	- 9
(7694, 8182)	$\cot^2(\omega)+6$	- 3
(7750, 7833)	$\cot^2(\omega)+8$	- 9
(7833, 11057)	$\cot^2(\omega)+9$	- 12
(7610, 8719)	$\cot^2(\omega)+9$	$-3\cot^2(\omega)-9$
(7802, 7833)	$\cot^2(\omega)+11$	- 18
(7618, 9756)	$2\cot^2(\omega)-15$	$-6\cot^2(\omega)+9$
(187, 2482)	$2\cot^2(\omega)-9$	9
(5215, 9167)	$2\cot^2(\omega)-7$	3
(98, 12117)	$2\cot^2(\omega)-6$	$-3\cot^2(\omega)+9$

(325, 14568)	$2\cot^2(\omega)-5$	-3
(98, 6390)	$2\cot^2(\omega)-5$	$-2\cot^2(\omega)+3$
(5309, 7818)	$2\cot^2(\omega)-4$	$\cot^2(\omega)-3$
(7840, 11177)	$2\cot^2(\omega)-3$	$-3\cot^2(\omega)$
(671, 12243)	$2\cot^2(\omega)-3$	$-\cot^2(\omega)-3$
(325, 671), (6055, 13449)	$2\cot^2(\omega)-3$	-9
(315, 14614), (5309, 7818), (7801, 11648)	$2\cot^2(\omega)-1$	-3
(7747, 9466)	$2\cot^2(\omega)-1$	9
(5188, 7745)	$2\cot^2(\omega)+1$	$-2\cot^2(\omega)+1$
(7748, 7818)	$2\cot^2(\omega)+1$	-9
(7753, 9466), (7810, 14537)	$2\cot^2(\omega)+1$	3
(7802, 11257)	$2\cot^2(\omega)+3$	$-\cot^2(\omega)-7$
(7767, 11257)	$2\cot^2(\omega)+3$	$-2\cot^2(\omega)-5$
(7620, 7710)	$2\cot^2(\omega)+3$	$-6\cot^2(\omega)+9$
(194, 14976)	$2\cot^2(\omega)+5$	-12
(8667, 8721)	$2\cot^2(\omega)+5$	$-6\cot^2(\omega)-3$
(3815, 8722)	$2\cot^2(\omega)+5$	$-2\cot^2(\omega)-3$
(5013, 8556)	$2\cot^2(\omega)+5$	-3
(7762, 14976)	$2\cot^2(\omega)+7$	-15
(7610, 7694)	$2\cot^2(\omega)+9$	$-6\cot^2(\omega)+9$
(7767, 7833)	$2\cot^2(\omega)+13$	-9
(7615, 8719)	$2\cot^2(\omega)+15$	$-6\cot^2(\omega)-9$
(8182, 8719)	$2\cot^2(\omega)+21$	$-6\cot^2(\omega)-27$
(2080, 7799)	$3\cot^2(\omega)-17$	$3\cot^2(\omega)+15$
(2080, 7809), (8724, 14568)	$3\cot^2(\omega)-13$	$3\cot^2(\omega)+3$
(12117, 14568)	$3\cot^2(\omega)-11$	$-3\cot^2(\omega)+15$
(98, 7799)	$3\cot^2(\omega)-7$	$-3\cot^2(\omega)+3$
(625, 6036)	$3\cot^2(\omega)-7$	$-\cot^2(\omega)-3$
(3095, 14458)	$3\cot^2(\omega)-5$	$-21\cot^2(\omega)+3$
(98, 7809)	$3\cot^2(\omega)-5$	$-3\cot^2(\omega)-3$
(12042, 13449)	$3\cot^2(\omega)-5$	$-\cot^2(\omega)-9$
(6321, 7799)	$3\cot^2(\omega)-5$	$3\cot^2(\omega)-21$

	(6321, 7779)	$3\cot^2(\omega)-4$	$3\cot^2(\omega)-21$
	(147, 9862)	$3\cot^2(\omega)-3$	$-\cot^2(\omega)+3$
	(6321, 7809), (10242, 14639)	$3\cot^2(\omega)-1$	$3\cot^2(\omega)-33$
	(6248, 14537), (7837, 13108)	$3\cot^2(\omega)-1$	$3\cot^2(\omega)+15$
	(5188, 14537)	$3\cot^2(\omega)+1$	$-3\cot^2(\omega)+3$
	(6248, 7753)	$3\cot^2(\omega)+1$	$3\cot^2(\omega)+9$
	(5188, 7753)	$3\cot^2(\omega)+2$	$-3\cot^2(\omega)$
	(6248, 9300)	$3\cot^2(\omega)+2$	$3\cot^2(\omega)+6$
	(6194, 7709)	$3\cot^2(\omega)+3$	$-4\cot^2(\omega)-3$
	(7840, 12355)	$3\cot^2(\omega)+3$	$3\cot^2(\omega)-45$
	(7811 11257)	$3\cot^2(\omega)+5$	$-3\cot^2(\omega)-9$
	(7830 13334)	$3\cot^2(\omega)+5$	$-\cot^2(\omega)-7$
	(3095, 7802)	$3\cot^2(\omega)+5$	$\cot^2(\omega)-11$
	(3095, 7811)	$3\cot^2(\omega)+7$	$3\cot^2(\omega)-9$
	(11057, 11257)	$3\cot^2(\omega)+7$	$-3\cot^2(\omega)-15$
	(3095, 11057)	$3\cot^2(\omega)+11$	$3\cot^2(\omega)-21$
	(9756, 12040)	$4\cot^2(\omega)-27$	$-12\cot^2(\omega)+9$
	(230, 2482)	$4\cot^2(\omega)-15$	9
	(6390, 14568)	$4\cot^2(\omega)-13$	3
	(3424, 9741)	$4\cot^2(\omega)-9$	3
	(10723, 12243)	$4\cot^2(\omega)-3$	$3\cot^2(\omega)-27$
	(7747, 9466)	$4\cot^2(\omega)-2$	18
	(5254, 7818)	$4\cot^2(\omega)-1$	- 9
	(7745, 9466)	$4\cot^2(\omega)+1$	9
	(7854, 9607)	$4\cot^2(\omega)+3$	- 5
	(7810, 9300)	$4\cot^2(\omega)+5$	- 3
	(7748, 8556)	$4\cot^2(\omega)+7$	3
	(5475, 11168)	$4\cot^2(\omega)+9$	9
	(631, 8556)	$4\cot^2(\omega)+13$	- 15
	(5485, 15428)	$4\cot^2(\omega)+15$	- 12
	(574, 11168)	$4\cot^2(\omega)+15$	- 9
	(9740, 15428)	$4\cot^2(\omega)+18$	$-12\cot^2(\omega)-9$
	(9166, 15561)	$5\cot^2(\omega)-33$	$3\cot^2(\omega)-9$

(2080, 12117)	$5\cot^2(\omega)-27$	$-3\cot^2(\omega)+45$
(620, 14693)	$5\cot^2(\omega)-19$	$\cot^2(\omega)+9$
(98, 8724), (99, 11632), (2482, 6055), (6321, 12117)	$5\cot^2(\omega)-15$	$-3\cot^2(\omega)+9$
(625, 14693)	$5\cot^2(\omega)-15$	$\cot^2(\omega)-3$
(7799, 11632)	$5\cot^2(\omega)-12$	$-3\cot^2(\omega)-3$
(6390, 11632)	$5\cot^2(\omega)-12$	$-3\cot^2(\omega)$
(7840, 9862)	$5\cot^2(\omega)-9$	$-9\cot^2(\omega)+9$
(325, 11632)	$5\cot^2(\omega)-9$	$-3\cot^2(\omega)-9$
(7809, 11632)	$5\cot^2(\omega)-7$	$-3\cot^2(\omega)-15$
(5346, 7818)	$5\cot^2(\omega)-7$	-9
(316, 11632)	$5\cot^2(\omega)-3$	$-3\cot^2(\omega)-27$
(3734, 10796)	$5\cot^2(\omega)-3$	$\cot^2(\omega)+9$
(7761, 10796)	$5\cot^2(\omega)+1$	$\cot^2(\omega)-3$
(7802, 7812)	$5\cot^2(\omega)+6$	-12
(7757, 7802)	$5\cot^2(\omega)+8$	-18
(7830, 11272)	$5\cot^2(\omega)+9$	$\cot^2(\omega)-11$
(7810, 14881)	$5\cot^2(\omega)+9$	$9\cot^2(\omega)-3$
(5188, 9300)	$6\cot^2(\omega)+5$	$-6\cot^2(\omega)-3$
(8591, 12188)	$7\cot^2(\omega)-21$	$-9\cot^2(\omega)+27$
(11632, 12117)	$7\cot^2(\omega)-19$	$-9\cot^2(\omega)+27$
(6390, 14830)	$7\cot^2(\omega)-18$	$-9\cot^2(\omega)+18$
(7799, 14830)	$7\cot^2(\omega)-17$	$-9\cot^2(\omega)+15$
(325, 14830)	$7\cot^2(\omega)-15$	$-9\cot^2(\omega)+9$
(7809, 14830)	$7\cot^2(\omega)-13$	$-9\cot^2(\omega)+3$
(98, 12243)	$7\cot^2(\omega)-12$	$-6\cot^2(\omega)$
(316, 14830), (7840, 12188)	$7\cot^2(\omega)-9$	$-9\cot^2(\omega)-9$
(7812, 9821)	$7\cot^2(\omega)+3$	$-9\cot^2(\omega)+3$
(10033, 11171)	$7\cot^2(\omega)+15$	$15\cot^2(\omega)-9$
(5305, 7818)	$8\cot^2(\omega)-5$	-9
(6721, 15092)	$9\cot^2(\omega)-27$	$5\cot^2(\omega)+11$
(5346, 7818)	$10\cot^2(\omega)-7$	-9
(2482, 12042)	$11\cot^2(\omega)-33$	$-9\cot^2(\omega)+27$

	(2080, 12243)	$11\cot^2(\omega)-27$	$-3\cot^2(\omega)+9$
	(6321, 12243)	$11\cot^2(\omega)-15$	$-3\cot^2(\omega)-27$
	(9166, 10242)	$11\cot^2(\omega)-9$	$3\cot^2(\omega)-81$
	(7801, 14880)	$11\cot^2(\omega)-9$	$-9\cot^2(\omega)+3$
	(7818, 14880)	$11\cot^2(\omega)-5$	$-9\cot^2(\omega)-9$
	(598, 9774)	$11\cot^2(\omega)-3$	$-9\cot^2(\omega)+9$
	(11632, 12243)	$13\cot^2(\omega)-21$	$-9\cot^2(\omega)-9$
	(6033, 11632)	$14\cot^2(\omega)-24$	$-3\cot^2(\omega)-18$
	(7799, 11632)	$15\cot^2(\omega)-33$	$-9\cot^2(\omega)-9$
	(7865, 10796)	$15\cot^2(\omega)-1$	$3\cot^2(\omega)+3$
	(9774, 11171)	$23\cot^2(\omega)+3$	$-21\cot^2(\omega)-12$
	(147, 12355), (568, 11455), (3656, 5691), (5655, 10733), (8724, 10723), (10722, 11632)	- 1	15
	(5872, 5873)	1	$(3)^{1/2}$
	(6243, 12290)	- 3	13
	(10263, 11381)	- 3	17
	(12295, 13392)	3	23
	(11381, 14449)	5	- 31
	(5925, 9833)	5	- 11
	(11694, 12295)	5	33
	(2487, 5587)	7	15
	(12512, 13624)	9	- 11
	(5462, 14128), (10095, 11793), (11801, 13392), (12900, 15088)	9	5
	(11591, 14641)	11	- 17
	(125, 13392), (5609, 13393), (5447, 10095), (9729, 14128), (11793, 12006)	11	- 1
	(3653, 5587)	11	3
	(10627, 14641)	13	- 23
	(5655, 14677), (9778, 10283)	13	- 15
	(12006, 13348), (12041, 13392)	15	- 13
	(165, 3653)	17	- 15

	(11017, 11695)	17	13
	(11592, 11695)	25	- 11
	(5650, 13451)	31	3
	(11693, 12041)	35	- 33
	(11693, 11801)	43	15
	(1352, 6560)	$\cot(\omega) - 1$	$\cot(\omega)+3$
	(1352, 6561)	$\cot(\omega)+1$	$\cot(\omega)-3$
	(1161, 5874)	$2\cot(\omega) - 3$	$- 6\cot(\omega)+1$
	(5870, 5875)	$2\cot(\omega) - 1$	$- 6\cot(\omega) - 5$
	(1161, 5870)	$2\cot(\omega) - 1$	$- 6\cot(\omega) - 1$
	(1350, 6560)	$2\cot(\omega) - 1$	$- 2\cot(\omega)+3$
	(1160, 5871)	$2\cot(\omega) + 1$	$- 6\cot(\omega)+1$
	(5871, 5874)	$2\cot(\omega) + 1$	$- 6\cot(\omega)+5$
	(1350, 6561)	$2\cot(\omega)+1$	$- 2\cot(\omega)-3$
	(1160, 5875)	$2\cot(\omega)+3$	$- 6\cot(\omega)-1$
	(599, 6561)	$4\cot(\omega)+3$	-9
	(599 6550)	$4\cot(\omega)-3$	9
	(16, 5464)	$2\cot(\omega)-3(3)^{1/2}$	$3(3)^{1/2}$
	(5321, 14539)	$2\cot(\omega)-(3)^{1/2}$	$-2\cot(\omega)-(3)^{1/2}$
	(5318, 14538)	$2\cot(\omega)+(3)^{1/2}$	$-2\cot(\omega)+(3)^{1/2}$
	(15, 5463)	$2\cot(\omega)+3(3)^{1/2}$	$-3(3)^{1/2}$
	(5321, 5474)	$3\cot(\omega)-11(3)^{1/2}$	$-6\cot(\omega)+3(3)^{1/2}$
	(617, 5615)	$3\cot(\omega)-7(3)^{1/2}$	$3\cot(\omega)+9(3)^{1/2}$
	(5858, 5865)	$3\cot(\omega)-5(3)^{1/2}$	$-9\cot(\omega)+3(3)^{1/2}$
	(16, 5613), (299, 5615)	$3\cot(\omega)-5(3)^{1/2}$	$3\cot(\omega)+3(3)^{1/2}$
	(16, 5474)	$3\cot(\omega)-4(3)^{1/2}$	$-3\cot(\omega)+6(3)^{1/2}$
	(395, 5613), (619, 7685)	$3\cot(\omega)-4(3)^{1/2}$	$3\cot(\omega)$
	(11543, 14539)	$3\cot(\omega)-3(3)^{1/2}$	$-4\cot(\omega)+(3)^{1/2}$
	(617, 6773)	$3\cot(\omega)-3(3)^{1/2}$	$3\cot(\omega)+3(3)^{1/2}$
	(5321, 5613)	$3\cot(\omega)-2(3)^{1/2}$	$-3\cot(\omega)-6(3)^{1/2}$
	(14, 14539), (299, 6773)	$3\cot(\omega)-2(3)^{1/2}$	$-3\cot(\omega)$
	(624, 5479), (5321, 5613)	$3\cot(\omega)-2(3)^{1/2}$	$3\cot(\omega)-6(3)^{1/2}$
	(5859, 5868)	$3\cot(\omega)-(3)^{1/2}$	$-9\cot(\omega)-3(3)^{1/2}$

(622, 6773)	$3\cot(\omega)-(3)^{1/2}$	$-3\cot(\omega)-3(3)^{1/2}$
(299, 13102)	$3\cot(\omega)-(3)^{1/2}$	$3\cot(\omega)-9(3)^{1/2}$
(621, 13103)	$3\cot(\omega)-(3)^{1/2}$	$3\cot(\omega)+15(3)^{1/2}$
(5858, 5869)	$3\cot(\omega)+(3)^{1/2}$	$-6\cot(\omega)+3(3)^{1/2}$
(621, 6770)	$3\cot(\omega)+(3)^{1/2}$	$-3\cot(\omega)+3(3)^{1/2}$
(622, 13102)	$3\cot(\omega)+(3)^{1/2}$	$3\cot(\omega)-15(3)^{1/2}$
(298, 13103)	$3\cot(\omega)+(3)^{1/2}$	$3\cot(\omega)+9(3)^{1/2}$
(13, 14538), (298, 6770)	$3\cot(\omega)+2(3)^{1/2}$	$-3\cot(\omega)$
(623, 5478), (5318, 5617)	$3\cot(\omega)+2(3)^{1/2}$	$3\cot(\omega)+6(3)^{1/2}$
(11542, 14538)	$3\cot(\omega)+3(3)^{1/2}$	$-4\cot(\omega)-(3)^{1/2}$
(616, 6770)	$3\cot(\omega)+3(3)^{1/2}$	$3\cot(\omega)-3(3)^{1/2}$
(15, 5473)	$3\cot(\omega)+4(3)^{1/2}$	$-3\cot(\omega)-6(3)^{1/2}$
(396, 5617), (618, 7684)	$3\cot(\omega)+4(3)^{1/2}$	$3\cot(\omega)$
(5859, 5864)	$3\cot(\omega)+5(3)^{1/2}$	$-9\cot(\omega)-3(3)^{1/2}$
(15, 5617), (298, 5611)	$3\cot(\omega)+5(3)^{1/2}$	$3\cot(\omega)-3(3)^{1/2}$
(616, 5611)	$3\cot(\omega)+7(3)^{1/2}$	$3\cot(\omega)-9(3)^{1/2}$
(5318, 5473)	$3\cot(\omega)+11(3)^{1/2}$	$-6\cot(\omega)-3(3)^{1/2}$
(395, 5464)	$4\cot(\omega)-5(3)^{1/2}$	$3(3)^{1/2}$
(624, 5460), (5321, 5464)	$4\cot(\omega)-3(3)^{1/2}$	$-3(3)^{1/2}$
(599, 6560)	$4\cot(\omega) - 3$	9
(599, 6561)	$4\cot(\omega)+3$	$- 9$
(623, 5459), (5318, 5463)	$4\cot(\omega)+3(3)^{1/2}$	$3(3)^{1/2}$
(396, 5463)	$4\cot(\omega)+5(3)^{1/2}$	$-3(3)^{1/2}$
(395, 5474)	$6\cot(\omega)-7(3)^{1/2}$	$-6\cot(\omega)+9(3)^{1/2}$
(5613, 11543)	$6\cot(\omega)-7(3)^{1/2}$	$6\cot(\omega)-3(3)^{1/2}$
(395, 14539), (5321, 5474)	$6\cot(\omega)-5(3)^{1/2}$	$-6\cot(\omega)+3(3)^{1/2}$
(396, 14538), (5318, 5473)	$6\cot(\omega)+5(3)^{1/2}$	$-6\cot(\omega)-3(3)^{1/2}$
(396, 5473)	$6\cot(\omega)+7(3)^{1/2}$	$-6\cot(\omega)-9(3)^{1/2}$
(5617, 11542)	$6\cot(\omega)+7(3)^{1/2}$	$6\cot(\omega)+3(3)^{1/2}$
(5464, 11543)	$8\cot(\omega)-9(3)^{1/2}$	$3(3)^{1/2}$
(5463, 11542)	$8\cot(\omega)+9(3)^{1/2}$	$-3(3)^{1/2}$
(5474, 11543)	$9\cot(\omega)-13(3)^{1/2}$	$-12\cot(\omega)-21(3)^{1/2}$
(619, 13349)	$9\cot(\omega)-11(3)^{1/2}$	$-3\cot(\omega)+9(3)^{1/2}$

	(624, 6774)	$9\cot(\omega)-7(3)^{1/2}$	$-3\cot(\omega)-3(3)^{1/2}$
	(6773, 13102)	$9\cot(\omega)-(3)^{1/2}$	$-3\cot(\omega)-9(3)^{1/2}$
	(6770, 13103)	$9\cot(\omega)+(3)^{1/2}$	$-3\cot(\omega)+9(3)^{1/2}$
	(623, 6771)	$9\cot(\omega)+7(3)^{1/2}$	$-3\cot(\omega)+3(3)^{1/2}$
	(618, 13350)	$9\cot(\omega)+11(3)^{1/2}$	$-3\cot(\omega)-9(3)^{1/2}$
	(5474, 11543)	$12\cot(\omega)-13(3)^{1/2}$	$-12\cot(\omega)+15(3)^{1/2}$
	(5473, 11542)	$12\cot(\omega)+13(3)^{1/2}$	$-12\cot(\omega)-15(3)^{1/2}$