

Переход от пространственных прямоугольных координат к геодезическим и обратно.

	X	Y	Z
1	-4232857.3	3610363.5	3108709.0
2	5105590.9	-555231.7	3769669.9
3	1017909.2	5469508.7	3108704.7
4	-1237740.3	5054311.4	3676219.2
5	-6180207.7	-807805.0	1349636.1
6	3025910.7	-4860086.6	2802556.9
7	5403744.1	1519955.8	3018231.8
8	-796969.6	5116950.4	3710950.8
9	-1194154.4	-4267263.2	4572907.9
10	3941691.7	-599814.0	4961985.4
11	1559908.1	3911002.1	4774753.2
12	-4827554.8	2329534.6	3445066.5
13	-3729152.3	-1409326.8	4962252.0
14	629408.8	-4016064.4	4898295.2
15	902261.5	5987197.6	2000075.7
16	-660917.0	4273435.3	4672907.6
17	-5485086.5	-765519.3	3153608.6
18	1241510.7	-5956980.5	1905203.0
19	3188081.3	4811898.4	2705350.9
20	-1976443.6	4292205.7	4269559.0
21	2647613.3	-4824776.9	3213183.6
22	3976030.6	-252880.5	4964806.3
23	4012162.0	4531620.2	2004965.2
24	-636359.4	3927539.4	4968419.2
25	-4535563.3	-138233.9	4467456.1
26	192886.8	-5782173.4	2676717.4
27	3003828.9	4875036.0	2799860.4
28	-5696400.8	422717.6	2828839.7
29	-5226904.0	-1929357.9	3094304.0
30	6004985.8	-598256.4	2057683.8
31	184288.7	4707610.4	4285030.8
32	-4963034.7	3399948.6	2111827.3
33	-4962556.6	-473183.7	3967850.5
34	1419870.1	-5511685.6	2869104.5
35	3586090.3	989798.6	5163424.1
36	-4007699.2	1249070.4	4786061.5
37	-4728331.2	-1605977.9	3955442.3
38	1953273.6	-4346199.4	4225618.5
39	3461722.5	3580875.8	3971339.7
40	-3085628.8	1339802.3	5401892.7
41	-5264145.2	-2033981.7	2962065.9
42	4401527.9	-4269825.2	1748292.0
43	739347.4	4898202.0	4004602.5
44	-4706682.3	862025.3	4203140.7
45	-589067.6	-5804390.1	2569374.9
46	2502730.9	-2475746.4	5300902.5
47	686844.1	5492238.5	3156851.7
48	-5191412.1	1617948.5	3322403.2
49	-3603759.6	-1435511.8	5046457.8
50	5425934.9	-1754504.5	2847146.7
51	2958279.5	4507406.4	3396572.2

Задание 2.
Изучение невозмущенного (Кеплеровского)
движения ИСЗ.

В.	Пр. 1	Пример 2		Пример 3		Пример 4				
	Тс	Нп	На	а км	e	а км	e	Mo	to	t
1	5440	155	1125	7000	0.010	8060	0.09	135	1.0	1.6
2	5500	165	1095	7020	0.030	8080	0.07	150	3.0	3.4
3	5530	150	1020	7030	0.040	8090	0.06	155	4.0	4.3
4	5560	155	1005	7040	0.050	8100	0.05	160	5.0	5.2
5	5590	160	990	7050	0.060	8110	0.04	165	6.8	7.0
6	5620	165	975	7060	0.070	8120	0.03	170	6.6	7.0
7	5470	160	1110	7010	0.020	8070	0.08	145	1.5	2.0
8	5650	170	950	7070	0.080	8130	0.02	175	8.0	8.9
9	5680	175	925	7080	0.080	8140	0.01	185	9.0	9.8
10	5710	180	900	7090	0.090	8150	0.02	190	10.0	10.7
11	5500	156	961	7610	0.068	8610	0.15	161	18.0	21.0
12	5048	166	874	7745	0.075	8745	0.30	174	14.5	15.0
13	5647	176	1095	8956	0.084	8956	0.45	195	16.0	19.0
14	5826	186	932	8325	0.091	7325	0.75	132	10.5	18.0
15	5942	196	1152	8521	0.005	7521	0.70	152	12.0	14.0
16	5033	206	852	7523	0.016	8523	0.75	152	13.5	18.0
17	5888	126	765	8654	0.014	7654	0.25	165	17.0	20.0
18	5915	226	885	7852	0.056	8852	0.95	185	10.5	15.0
19	5453	236	1294	7941	0.024	8941	0.10	194	20.0	21.0
20	5151	246	921	7214	0.092	8214	0.25	121	9.5	10.0
21	5610	168	861	7615	0.035	8615	0.30	161	18.0	21.0
22	5745	175	872	7729	0.048	8729	0.25	172	10.5	15.0
23	5956	184	895	8952	0.051	8952	0.70	195	15.0	17.0
24	5325	191	910	7009	0.067	8009	0.80	100	12.5	16.0
25	5521	205	825	7254	0.084	8254	0.15	125	14.0	17.0
26	5523	216	1062	7625	0.090	8625	0.20	162	18.5	20.0
27	5654	214	796	8965	0.006	7965	0.40	196	11.0	20.0
28	5852	156	812	7521	0.015	8121	0.30	152	15.5	18.0
29	5941	224	873	7623	0.021	8733	0.10	162	19.0	22.0
30	5214	192	1168	7389	0.029	8689	0.20	138	22.5	25.0
31	5615	135	804	7045	0.075	8045	0.15	104	10.0	21.0
32	5729	148	841	7410	0.041	8410	0.30	141	9.5	19.0
33	5952	151	815	7956	0.053	8156	0.45	195	11.0	20.0
34	5009	167	796	8965	0.009	7965	0.75	196	20.5	22.0
35	5254	184	802	8022	0.012	8022	0.70	102	14.0	19.0
36	5625	190	845	7456	0.095	8456	0.13	145	20.5	23.0
37	5965	206	895	8954	0.086	8954	0.10	195	10.0	22.0
38	5521	215	811	7112	0.064	8112	0.55	111	15.5	17.0
39	5623	221	1204	7045	0.009	8045	0.10	104	20.0	24.0
40	5389	229	862	7624	0.052	8624	0.35	162	14.5	19.0
41	5045	175	874	7745	0.031	8745	0.25	174	9.5	22.0
42	5410	141	895	7952	0.025	8952	0.15	195	12.0	20.0
43	5956	153	801	7010	0.018	8010	0.35	101	15.5	18.0
44	5965	201	854	7541	0.001	8541	0.95	154	19.0	22.0
45	5022	212	896	7965	0.096	8965	0.20	196	20.5	26.0
46	5456	195	892	8922	0.083	8922	0.50	192	22.0	25.0
47	5954	186	834	7346	0.070	8346	0.40	134	16.5	19.0
48	5112	164	752	8523	0.056	7523	0.25	152	14.0	21.0
49	5045	209	1362	7624	0.042	8624	0.95	162	10.5	15.0
50	5624	152	897	7978	0.010	8978	0.45	197	22.0	25.0

Задание 3

Вычисление пространственных координат ИСЗ по наблюдениям с одной станции.

Вар.	r' (m)	φ	S			A			h			
			h	m	s	o	'	''	o	'	''	
1	512126.9	0 0	-3.27	15	07	31.5	96	03	42	62	53	17
2	668883.5	0 0	1.91	23	14	42.4	123	42	28	57	27	43
3	446185.3	0 0	1.42	11	03	51.6	203	16	46	44	03	08
4	355197.1	0 0	-0.98	2	15	49.3	177	29	34	39	51	46
5	1325415.6	0 0	2.59	10	37	53.5	121	29	19	51	45	20
6	635214.6	0 0	0.28	13	28	45.7	312	05	28	41	26	50
7	347215.4	0 0	-1.24	14	35	41.8	145	26	45	45	36	15
8	516589.1	0 0	2.21	15	38	45.7	56	23	42	34	21	54
9	1254638.5	0 0	0.17	21	45	12.4	245	28	26	52	17	05
10	456215.4	0 0	1.21	25	35	36.2	148	15	36	39	15	56
11	542316.5	0 0	-2.34	11	56	24.1	55	45	12	35	48	25
12	325647.4	0 0	1.25	5	24	39.5	125	36	45	51	05	39
13	1254698.8	0 0	-0.58	14	26	34.2	142	34	58	49	56	41
14	856912.4	0 0	1.54	10	09	12.7	69	45	06	54	26	14
15	756214.1	0 0	-2.12	17	26	48.1	254	51	43	74	24	36
16	325648.4	0 0	1.45	20	45	23.5	354	24	56	91	54	31
17	654890.4	0 0	-3.45	21	26	45.9	95	21	39	56	24	39
18	456213.9	0 0	0.57	20	12	56.4	125	56	23	49	26	45
19	356874.5	0 0	1.78	18	45	38.1	129	21	32	71	13	45
20	456218.6	0 0	-2.45	21	54	26.9	99	25	36	65	52	12
21	1345512.4	0 0	2.84	6	45	26.5	97	15	23	59	21	09
22	865412.8	0 0	0.56	18	14	15.3	241	08	36	44	44	55
23	742681.0	0 0	-0.21	16	25	17.6	312	56	41	52	39	12
24	456213.8	0 0	2.02	16	39	45.9	126	58	43	65	23	46
25	514689.6	0 0	-1.56	19	36	54.5	254	36	48	49	26	48
26	456123.9	0 0	0.26	17	56	41.6	100	00	25	54	21	58
27	356987.7	0 0	1.11	11	11	11.1	95	25	36	58	21	39
28	569852.4	0 0	2.22	22	22	22.2	154	00	25	70	26	00
29	625469.0	0 0	3.11	21	06	09.2	121	03	28	49	26	21
30	1256412.6	0 0	-2.45	6	23	56.5	198	29	09	39	45	15
31	892233.3	0 0	0.45	16	28	36.6	201	35	49	65	15	09
32	812563.4	0 0	1.17	20	36	25.9	218	39	51	70	19	29
33	426525.4	0 0	-1.71	9	39	29.0	219	46	02	40	28	35
34	423694.9	0 0	2.54	19	42	36.5	245	56	26	45	29	41
35	666654.0	0 0	1.26	20	52	42.1	269	06	32	51	39	46
36	756215.5	0 0	-3.56	9	08	53.6	300	19	43	59	46	51
37	854221.1	0 0	0.52	10	15	06.7	321	19	56	65	51	10
38	755566.9	0 0	0.65	12	26	13.5	355	29	09	70	54	16
39	659874.6	0 0	-0.69	15	30	21.6	96	36	15	68	01	23
40	562233.8	0 0	0.74	16	41	29.9	102	43	26	64	12	30
41	445896.4	0 0	0.85	18	50	36.5	115	51	31	63	15	39
42	399854.5	0 0	-1.02	19	55	41.0	125	59	40	62	24	45
43	854232.6	0 0	1.09	20	54	49.3	126	05	43	61	29	51
44	785698.4	0 0	1.26	21	00	51.6	139	16	46	60	51	36
45	652314.6	0 0	1.39	19	15	55.6	156	25	50	56	06	39
46	1235648.5	0 0	-1.56	15	24	06.4	162	34	55	55	19	45
47	542214.9	0 0	1.49	12	36	19.0	175	46	06	54	26	51
48	456897.6	0 0	-1.99	10	41	26.2	186	55	13	51	35	09
49	325648.9	0 0	2.05	9	46	32.1	201	06	25	49	46	16
50	854236.4	0 0	3.54	6	55	39.8	245	19	34	45	53	29
51	562314.1	0 0	-3.25	15	06	45.1	326	25	54	40	54	09

ЗАДАНИЕ 4

Вычисление пространственных прямоугольных координат ИСЗ по синхронным фотографическим наблюдениям с 2-х пунктов.

В.	δ_1 α_1	β_1 γ_1	δ_2 α_2	β_2 γ_2
1	13 53 32.01	276 42 26.37	71 13 09.51	337 13 00.7
2	13 39 30.02	279 12 39.77	68 53 55.03	334 33 00.0
3	15 33 02.03	279 00 59.55	70 09 27.75	338 15 04.1
4	22 08 22.04	280 02 03.30	70 57 22.29	337 36 32.2
5	28 54 09.05	280 54 28.60	69 36 39.81	324 34 49.8
6	28 56 04.06	282 51 05.30	68 45 46.53	326 45 45.4
7	26 00 39.07	281 15 24.71	67 33 14.07	321 14 44.7
8	28 35 57.08	282 19 50.02	68 49 41.79	325 55 27.7
9	24 40 16.09	273 22 32.11	73 32 19.77	322 06 00.4
10	24 44 31.10	272 49 51.30	73 42 14.48	320 45 07.8
11	14 55 42.08	277 32 56.30	70 59 29.00	338 03 01.4
12	15 59 35.00	276 52 49.70	69 55 50.77	327 50 19.4
13	16 13 52.03	280 27 09.49	68 36 43.50	334 16 15.1
14	25 58 42.04	273 42 00.31	73 08 25.30	319 51 19.9
15	27 44 29.04	277 34 48.59	72 21 27.05	328 04 15.7
16	15 15 53.91	272 41 51.27	72 10 27.62	323 15 12.6
17	16 24 09.09	274 55 04.71	70 23 44.80	322 23 59.8
18	17 56 41.07	281 59 58.99	67 49 42.39	333 41 14.5
19	18 40 56.09	275 27 34.09	71 48 53.84	328 28 14.7
20	19 54 47.10	277 16 51.35	70 19 20.29	326 24 47.3
21	23 43 38.00	275 44 45.30	71 28 49.38	321 56 13.4
22	18 39 30.03	279 12 39.70	67 02 20.38	321 26 15.9
23	25 43 32.02	282 50 49.51	69 45 17.48	335 47 26.9
24	21 48 32.03	276 52 43.31	71 25 16.80	327 59 19.9
25	26 54 49.04	280 54 38.60	68 51 20.58	323 52 48.3
26	21 50 44.06	274 21 05.30	71 07 32.97	317 47 45.9
27	19 01 04.72	281 19 32.53	67 21 55.53	328 17 59.7
28	25 25 47.07	279 29 54.00	68 36 30.98	320 35 09.1
29	15 46 16.09	278 24 32.15	68 54 58.86	328 59 51.8
30	20 34 36.52	274 40 51.16	72 21 04.47	325 50 56.0
31	12 55 22.07	283 32 06.30	64 35 36.63	331 42 07.9
32	17 19 35.02	279 22 49.63	70 52 28.80	342 12 53.4
33	19 13 52.03	272 27 09.49	72 04 02.00	317 39 11.5
34	20 48 49.04	283 42 41.30	68 26 24.41	338 51 22.6
35	25 40 29.05	280 34 48.60	66 00 30.74	315 28 30.9
36	13 15 54.05	270 41 51.30	71 43 36.18	315 47 33.0
37	19 24 29.07	270 05 04.70	73 57 23.33	316 51 40.4
38	25 26 31.08	271 29 59.00	74 13 01.68	317 26 10.2
39	24 45 26.09	270 37 34.10	75 24 54.82	321 08 30.2
40	13 50 17.11	272 36 51.29	71 25 51.50	321 06 59.0
41	14 50 31.07	275 23 20.21	71 18 39.04	330 23 50.9
42	15 49 40.11	280 22 49.80	69 01 38.62	336 45 11.2
43	16 59 51.22	281 35 58.31	68 58 48.90	339 38 28.1
44	17 05 09.21	282 49 05.60	68 15 50.09	340 07 07.5
45	19 24 18.22	280 56 25.21	68 58 08.78	333 33 47.0

46	21	32	45.22	278	05	29.00	70	27	42.28	327	58	16.8
47	22	45	50.54	277	14	25.60	70	37	16.19	324	19	01.3
48	23	12	55.21	280	24	36.41	70	14	37.99	333	07	32.2
49	26	51	25.14	282	32	49.10	67	48	43.55	324	40	31.5
50	28	06	39.19	276	24	09.60	71	50	02.64	320	51	34.9

Задание 5.

Определение пространственных прямоугольных координат ИСЗ по трем измеренным топоцентрическим расстояниям.

Вар	D1 (m)	D2 (m)	D3 (m)
1	988505.3	1422537.7	1051543.9
2	1043061.8	1453207.0	1042813.2
3	1009148.1	1467104.6	1082124.0
4	1068409.8	1599655.8	1176655.4
5	1343004.4	1876103.9	1309366.5
6	1348971.4	1890490.3	1326772.9
7	1383540.2	1856880.7	1255535.2
8	1348296.5	1881887.4	1315177.1
9	1175211.3	1668390.4	1169622.6
10	1182232.7	1671414.0	1168028.5
11	993333.0	1444103.0	1069512.3
12	1100622.3	1504033.3	1043635.8
13	1075412.3	1514341.9	1081473.4
14	1222971.6	1719050.0	1194865.1
15	1204312.3	1752472.8	1251590.2
16	1083365.5	1465026.5	1012979.3
17	1136816.9	1518504.1	1027696.2
18	1115636.6	1569220.4	1112439.2
19	1088141.3	1534666.0	1084389.3
20	1150141.5	1594297.9	1103735.5
21	1213862.1	1685165.5	1160028.6
22	1256190.1	1641394.4	1079960.1
23	1160933.3	1719614.6	1250531.7
24	1137685.1	1616358.8	1138176.1
25	1331751.3	1835875.2	1265488.7
26	1226669.3	1654894.9	1112866.5
27	1190687.7	1622427.6	1112664.4
28	1341453.5	1810190.4	1223396.0
29	1109075.9	1512131.6	1048332.3
30	1118948.6	1576953.3	1106397.4
31	1142920.0	1511217.1	1038864.6
32	981188.7	1483560.8	1120584.7
33	1167525.9	1570309.2	1059913.4
34	1089024.8	1608999.6	1179596.8
35	1494415.0	1923077.0	1262013.2
36	1120262.3	1439082.7	955834.3
37	1132130.4	1545870.7	1061872.3
38	1203768.4	1690323.1	1175381.3
39	1139477.2	1639476.4	1164711.1
40	1097994.7	1447431.5	982948.8
41	1045131.6	1453835.8	1034598.2
42	1042483.2	1492684.2	1084709.5
43	1029277.2	1510891.1	1116051.9
44	1037974.9	1522688.1	1124796.0
45	1110917.6	1584078.3	1129130.6
46	1155831.4	1627660.2	1138530.3
47	1201032.0	1668726.9	1151087.8
48	1137980.1	1655481.7	1187812.6
49	1357203.5	1860358.0	1281402.4
50	1290800.0	1807763.8	1255873.5

Задание 6.

Вычисление эфимерид ИСЗ.

Вор.	акт	L_0	i	S_0	ω	M_0	L_0	t	φ	ΔR
1	7500	0.156	50.0	5.30	10.0	145.0	8.0	11.0	51.0	1.10
2	7048	0.166	55.0	5.40	20.0	150.0	8.5	12.0	52.0	1.20
3	6647	0.176	60.0	5.50	30.0	155.0	9.0	13.0	53.0	1.30
4	6826	0.186	65.0	5.60	40.0	160.0	9.5	14.0	54.0	1.40
5	6942	0.196	70.0	5.70	50.0	165.0	10.0	15.0	55.0	1.50
6	7033	0.206	75.0	5.80	60.0	170.0	10.5	16.0	56.0	1.60
7	6888	0.126	80.0	5.90	70.0	175.0	11.0	17.0	57.0	1.70
8	7915	0.226	85.0	6.00	80.0	180.0	11.5	18.0	58.0	1.80
9	7453	0.236	80.0	6.10	110.0	185.0	12.0	19.0	59.0	1.90
10	7151	0.246	75.0	6.20	120.0	190.0	12.5	20.0	60.0	2.00
11	7610	0.168	53.0	6.15	110.0	154.0	18.0	21.0	42.0	2.10
12	7745	0.175	58.0	6.30	120.0	160.0	14.5	15.0	45.0	1.50
13	6956	0.184	62.0	6.45	130.0	175.0	16.0	19.0	47.0	2.00
14	6325	0.191	65.0	6.75	105.0	184.0	10.5	18.0	49.0	1.90
15	6521	0.205	64.0	5.70	95.0	193.0	12.0	14.0	51.0	1.80
16	7523	0.216	69.0	5.75	85.0	139.0	13.5	18.0	53.0	1.70
17	6654	0.214	71.0	6.25	74.0	142.0	17.0	20.0	54.0	1.90
18	7852	0.156	72.0	5.95	62.0	151.0	10.5	15.0	56.0	2.10
19	7941	0.224	76.0	6.10	125.0	170.0	20.0	21.0	58.0	2.00
20	7214	0.192	81.0	5.25	23.0	189.0	9.5	10.0	61.0	1.50
21	7615	0.135	48.0	6.30	15.0	154.0	18.0	21.0	64.0	2.10
22	7729	0.148	75.0	6.25	21.0	159.0	10.5	15.0	62.0	1.90
23	6952	0.151	54.0	5.70	36.0	165.0	15.0	17.0	59.0	1.80
24	7009	0.167	65.0	5.80	44.0	164.0	12.5	16.0	57.0	1.75
25	7254	0.184	64.0	6.00	55.0	175.0	14.0	17.0	55.0	1.70
26	7625	0.190	70.0	6.20	57.0	179.0	18.5	20.0	54.0	1.65
27	6965	0.206	52.0	5.40	74.0	185.0	11.0	20.0	52.0	1.55
28	7521	0.215	59.0	6.30	81.0	180.0	15.5	18.0	50.0	1.60
29	7623	0.221	67.0	6.10	120.0	189.0	19.0	22.0	55.0	1.75
30	7389	0.229	85.0	6.20	125.0	194.0	22.5	25.0	65.0	2.10
31	7045	0.175	81.0	5.15	130.0	161.0	10.0	21.0	46.0	2.15
32	7410	0.141	74.0	5.30	140.0	174.0	9.5	19.0	55.0	1.60
33	7956	0.153	82.0	5.45	150.0	170.0	11.0	20.0	49.0	2.15
34	6965	0.201	71.0	5.75	117.0	189.0	20.5	22.0	58.0	1.10
35	6022	0.212	64.0	6.70	85.0	183.0	14.0	19.0	61.0	1.50
36	7456	0.195	59.0	6.00	89.0	145.0	20.5	23.0	50.0	1.65
37	6954	0.186	45.0	6.10	64.0	153.0	10.0	22.0	64.0	1.75
38	7112	0.164	52.0	5.55	65.0	146.0	15.5	17.0	59.0	2.00
39	7045	0.209	65.0	5.10	145.0	179.0	20.0	24.0	50.0	1.50
40	7624	0.152	72.0	5.35	123.0	199.0	14.5	19.0	63.0	1.90
41	7745	0.231	49.0	5.25	70.0	154.0	9.5	22.0	45.0	1.10
42	7952	0.225	53.0	6.15	81.0	161.0	12.0	20.0	51.0	1.15
43	7010	0.218	58.0	6.35	86.0	184.0	15.5	18.0	56.0	1.25
44	7541	0.201	61.0	5.95	94.0	192.0	19.0	22.0	60.0	1.40
45	7965	0.196	81.0	5.20	100.0	179.0	20.5	26.0	51.0	1.50
46	6922	0.183	72.0	6.50	120.0	175.0	22.0	25.0	62.0	1.60
47	7346	0.170	86.0	6.40	117.0	159.0	16.5	19.0	55.0	1.65
48	6523	0.156	93.0	6.25	125.0	161.0	14.0	21.0	60.0	1.70
49	7624	0.142	59.0	5.95	85.0	175.0	10.5	15.0	54.0	2.15
50	7978	0.200	60.0	5.45	94.0	154.0	22.0	25.0	56.0	1.65
51	7910	0.118	56.0	5.80	134.0	148.0	10.5	22.0	53.0	1.80

Задание 7.

Определение параметров общего земного эллипсоида по наблюдениям ИСЗ.

Вар	X (m)	Y (m)	Z (m)	H
1	-1535758.0	-5166993.0	3401040.0	1621.0
	-3983748.0	3743099.0	-3275592.0	169.0
	-3946695.0	3366285.0	3698841.0	95.0
	1942768.0	-5804075.0	-1796960.0	2489.0
2	5056124.0	2716484.0	-2775815.0	1571.0
	4012162.0	4531620.0	2004965.0	-54.0
	5105591.0	-555232.0	3769672.0	66.0
	1018205.0	5471098.0	3109613.0	1866.0
3	3376881.0	4403983.0	3136253.0	1572.0
	-3983748.0	3743099.0	-3275592.0	169.0
	-3946695.0	3366285.0	3698841.0	95.0
	1942768.0	-5804075.0	-1796960.0	2489.0
4	2251819.0	-5816912.0	1327163.0	-24.0
	-4232857.0	3610363.0	3108709.0	24.0
	5105590.0	-555231.0	3769669.0	64.0
	1017909.0	5469508.0	3108704.0	10.0
5	-1237740.0	5054311.0	3676219.0	237.0
	-6180207.0	-807805.0	1349636.0	47.0
	3025910.0	-4860086.0	2802556.0	244.0
	5403744.0	1519955.0	3018231.0	88.0
6	-796969.0	5116950.0	3710950.0	125.0
	-1194154.0	-4267263.0	4572907.0	568.0
	3941691.0	-599814.0	4961985.0	253.0
	1559908.0	3911002.0	4774753.0	36.0
7	-4827554.0	2329534.0	3445066.0	-17.0
	-3729152.0	-1409326.0	4962252.0	154.0
	629408.0	-4016064.0	4898295.0	-60.0
	902261.0	5987197.0	2000075.0	561.0
8	-660917.0	4273435.0	4672907.0	124.0
	-5485086.0	-765519.0	3153608.0	294.0
	1241510.0	-5956980.0	1905203.0	41.0
	3188081.0	4811898.0	2705350.0	452.0
9	-1976443.0	4292205.0	4269559.0	50.0
	2647613.0	-4824776.0	3213183.0	137.0
	3976030.0	-252880.0	4964806.0	586.0
	4012162.0	4531620.0	2004965.0	-54.0
10	-636359.0	3927539.0	4968419.0	107.0
	-4535563.0	-138233.0	4467456.0	189.0
	192886.0	-5782173.0	2676717.0	245.0
	6004985.0	-598256.0	2057683.0	-27.0

11	184288.0	4707610.0	4285030.0	6.0
	-4963034.0	3399948.0	2111827.0	41.0
	-4962556.0	-473183.0	3967850.0	1574.0
	1419870.0	-5511685.0	2869104.0	97.0
12	-4007699.0	1249070.0	4786061.0	147.0
	-4728331.0	-1605977.0	3955442.0	512.0
	1953273.0	-4346199.0	4225618.0	16.0
	-3085628.0	1339802.0	5401892.0	983.0
13	-5264145.0	-2033981.0	2962065.0	44.0
	4401527.0	-4269825.0	1748292.0	99.0
	739347.0	4898202.0	4004602.0	253.0
	-4706682.0	862025.0	4203140.0	54.0
14	-589067.0	-5804390.0	2569374.0	268.0
	2502730.0	-2475746.0	5300902.0	95.0
	686844.0	5492238.0	3156851.0	-892.0
	-5191412.0	1617948.0	3322403.0	44.0
15	-3603759.0	-1435511.0	5046457.0	425.0
	3003828.0	4875036.0	2799860.0	24.0
	-5696400.0	422717.0	2828839.0	252.0
	-5226904.0	-1929357.0	3094304.0	117.0
16	-4827554.0	2329534.0	3445066.0	-17.0
	2647613.0	-4824776.0	3213183.0	137.0
	4007699.0	1249070.0	4786061.0	147.0
	-6180207.0	-807805.0	1349636.0	47.0
17	1559908.0	3911002.0	4774753.0	36.0
	-1535758.0	-5166993.0	3401040.0	1621.0
	-3946695.0	3366285.0	3698841.0	95.0
	1017909.0	5469508.0	3108704.0	10.0
18	-796969.0	5116950.0	3710950.0	125.0
	-3983748.0	3743099.0	-3275592.0	169.0
	2251819.0	-5816912.0	1327163.0	-24.0
	3941691.0	-599814.0	4961985.0	253.0
19	-1976443.0	4292205.0	4269559.0	50.0
	-3946695.0	3366285.0	3698841.0	95.0
	-4232857.0	3610363.0	3108709.0	24.0
	1559908.0	3911002.0	4774753.0	36.0
20	2647613.0	-4824776.0	3213183.0	137.0
	1942768.0	-5804075.0	-1796960.0	2489.0
	5105590.0	-555231.0	3769669.0	64.0
	-4827554.0	2329534.0	3445066.0	-17.0
21	3976030.0	-252880.0	4964806.0	586.0
	5056124.0	2716484.0	-2775815.0	1571.0
	1017909.0	5469508.0	3108704.0	10.0
	-3729152.0	-1409326.0	4962252.0	154.0
	4012162.0	4531620.0	2004965.0	-54.0

22	4012162.0	4531620.0	2004965.0	-54.0
	5105591.0	-555232.0	3769672.0	66.0
	-1237740.0	5054311.0	3676219.0	237.0
	629408.0	-4016064.0	4898295.0	-60.0
23	-636359.0	3927539.0	4968419.0	107.0
	1018205.0	5471098.0	3109613.0	1866.0
	-6180207.0	-807805.0	1349636.0	47.0
	902261.0	5987197.0	2000075.0	561.0
24	-4535563.0	-138233.0	4467456.0	189.0
	3376881.0	4403983.0	3136253.0	1572.0
	5403744.0	1519955.0	3018231.0	88.0
	-5485086.0	-765519.0	3153608.0	294.0
25	6004985.0	-598256.0	2057683.0	-27.0
	4401527.0	-4269825.0	1748292.0	99.0
	-5226904.0	-1929357.0	3094304.0	117.0
	2502730.0	-2475746.0	5300902.0	95.0
26	6004985.0	-598256.0	2057683.0	-27.0
	4401527.0	-4269825.0	1748292.0	99.0
	-5226904.0	-1929357.0	3094304.0	117.0
	-1535758.0	-5166993.0	3401040.0	1621.0
27	184288.0	4707610.0	4285030.0	6.0
	739347.0	4898202.0	4004602.0	253.0
	1953273.0	-4346199.0	4225618.0	16.0
	-3603759.0	-1435511.0	5046457.0	425.0
28	-3085628.0	1339802.0	5401892.0	983.0
	-4706682.0	862025.0	4203140.0	54.0
	-3085628.0	1339802.0	5401892.0	983.0
	3003828.0	4875036.0	2799860.0	24.0
29	-4962556.0	-473183.0	3967850.0	1574.0
	-589067.0	-5804390.0	2569374.0	268.0
	-5264145.0	-2033981.0	2962065.0	44.0
	-5696400.0	422717.0	2828839.0	252.0
30	1942768.0	-5804075.0	-1796960.0	2489.0
	5403744.0	1519955.0	3018231.0	88.0
	2647613.0	-4824776.0	3213183.0	137.0
	1419870.0	-5511685.0	2869104.0	97.0
31	5105591.0	-555232.0	3769672.0	66.0
	3376881.0	4403983.0	3136253.0	1572.0
	-3983748.0	3743099.0	-3275592.0	169.0
	1942768.0	-5804075.0	-1796960.0	2489.0
32	2251819.0	-5816912.0	1327163.0	-24.0
	5105590.0	-555231.0	3769669.0	64.0
	1017909.0	5469508.0	3108704.0	10.0
	-6180207.0	-807805.0	1349636.0	47.0
33	3025910.0	-4860086.0	2802556.0	244.0
	5403744.0	1519955.0	3018231.0	88.0
	-796969.0	5116950.0	3710950.0	125.0
	3941691.0	-599814.0	4961985.0	253.0

34	1559908.0	3911002.0	4774753.0	36.0
	-3729152.0	-1409326.0	4962252.0	154.0
	-660917.0	4273435.0	4672907.0	124.0
	3188081.0	4811898.0	2705350.0	452.0
35	2647613.0	-4824776.0	3213183.0	137.0
	4012162.0	4531620.0	2004965.0	-54.0
	-4535563.0	-138233.0	4467456.0	189.0
	6004985.0	-598256.0	2057683.0	-27.0
36	184288.0	4707610.0	4285030.0	6.0
	-4962556.0	-473183.0	3967850.0	1574.0
	1419870.0	-5511685.0	2869104.0	97.0
	1953273.0	-4346199.0	4225618.0	16.0
37	-5264145.0	-2033981.0	2962065.0	44.0
	739347.0	4898202.0	4004602.0	253.0
	-589067.0	-5804390.0	2569374.0	268.0
	2502730.0	-2475746.0	5300902.0	95.0
38	-5696400.0	422717.0	2828839.0	252.0
	1559908.0	3911002.0	4774753.0	36.0
	-3983748.0	3743099.0	-3275592.0	169.0
	-1976443.0	4292205.0	4269559.0	50.0
39	2647613.0	-4824776.0	3213183.0	137.0
	3976030.0	-252880.0	4964806.0	586.0
	4012162.0	4531620.0	2004965.0	-54.0
	629408.0	-4016064.0	4898295.0	-60.0
40	-6180207.0	-807805.0	1349636.0	47.0
	6004985.0	-598256.0	2057683.0	-27.0
	6004985.0	-598256.0	2057683.0	-27.0
	-3085628.0	1339802.0	5401892.0	983.0
41	-4962556.0	-473183.0	3967850.0	1574.0
	-3983748.0	3743099.0	-3275592.0	169.0
	1942768.0	-5804075.0	-1796960.0	2489.0
	4012162.0	4531620.0	2004965.0	-54.0
42	-3603759.0	-1435511.0	5046457.0	425.0
	-5696400.0	422717.0	2828839.0	252.0
	-4827554.0	2329534.0	3445066.0	-17.0
	4007699.0	1249070.0	4786061.0	147.0
43	-3983748.0	3743099.0	-3275592.0	169.0
	1942768.0	-5804075.0	-1796960.0	2489.0
	4012162.0	4531620.0	2004965.0	-54.0
	-3603759.0	-1435511.0	5046457.0	425.0
44	3376881.0	4403983.0	3136253.0	1572.0
	5105590.0	-555231.0	3769669.0	64.0
	-3085628.0	1339802.0	5401892.0	983.0
	-5264145.0	-2033981.0	2962065.0	44.0
45	4401527.0	-4269825.0	1748292.0	99.0
	739347.0	4898202.0	4004602.0	253.0
	2502730.0	-2475746.0	5300902.0	95.0
	3025910.0	-4860086.0	2802556.0	244.0

46	5403744.0	1519955.0	3018231.0	88.0
	-3729152.0	-1409326.0	4962252.0	154.0
	4012162.0	4531620.0	2004965.0	-54.0
	-3729152.0	-1409326.0	4962252.0	154.0
47	-5485086.0	-765519.0	3153608.0	294.0
	192886.0	-5782173.0	2676717.0	245.0
	6004985.0	-598256.0	2057683.0	-27.0
	184288.0	4707610.0	4285030.0	6.0
48	-4963034.0	3399948.0	2111827.0	41.0
	1419870.0	-5511685.0	2869104.0	97.0
	1953273.0	-4346199.0	4225618.0	16.0
	5403744.0	1519955.0	3018231.0	88.0
49	2647613.0	-4824776.0	3213183.0	137.0
	1419870.0	-5511685.0	2869104.0	97.0
	-3085628.0	1339802.0	5401892.0	983.0
	-4962556.0	-473183.0	3967850.0	1574.0
50	-3983748.0	3743099.0	-3275592.0	169.0
	-5696400.0	422717.0	2828839.0	252.0
	-4827554.0	2329534.0	3445066.0	-17.0
	5105591.0	-555232.0	3769672.0	66.0