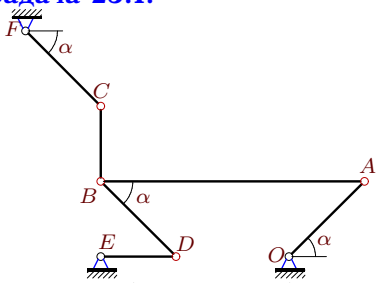
Механизм с двумя степенями свободы

В указанном положении механизма заданы угловые скорости двух его звеньев. Длины звеньев даны в сантиметрах. Стержни, направление которых не указано, считать горизонтальными или вертикальными. Найти угловые скорости всех звеньев механизма.

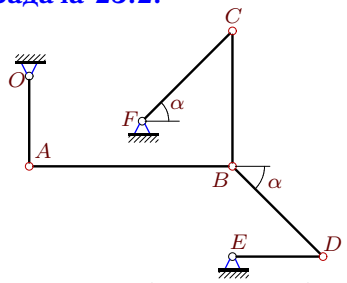
Кирсанов М.Н. **Решебник. Теоретическая механика**/Под ред. А. И. Кириллова.– М.:ФИЗМАТЛИТ, 2008.– 384 с. (с.158.)

Задача 25.1. 3



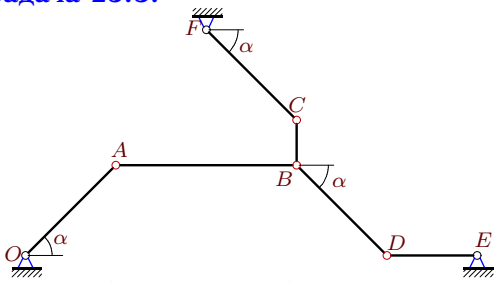
$\omega_{CF_z} = -3\frac{1}{c}$, $\omega_{DE_z} = 1\frac{1}{c}$, $AB = 7$, $BC = 2$, $DE = 2$, $OA = CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.2. 3



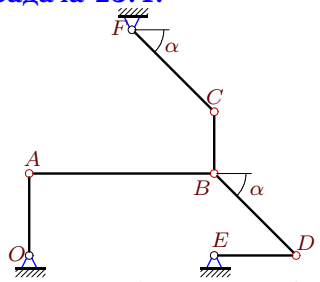
$\omega_{CF_z} = -18\frac{1}{c}$, $\omega_{DE_z} = 9\frac{1}{c}$, $AB = 9$, $BC = 6$, $DE = 4$, $OA = 4$, $CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

Задача 25.3. 3



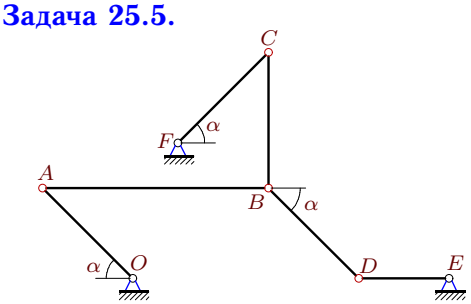
$\omega_{CF_z} = 6\frac{1}{c}$, $\omega_{DE_z} = -2\frac{1}{c}$, $AB = 4$, $BC = 1$, $DE = 2$, $OA = CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.4. 3



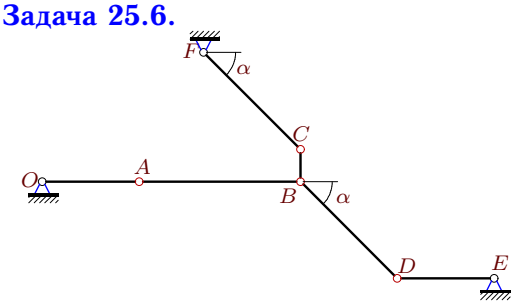
$\omega_{OA_z} = -3\frac{1}{c}$, $\omega_{DE_z} = 6\frac{1}{c}$, $AB = 9$, $BC = 3$, $DE = 4$, $OA = 4$, $CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

Задача 25.5. 3



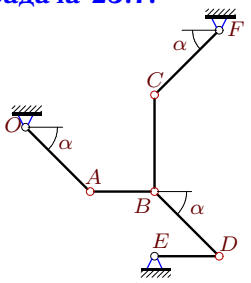
$\omega_{OA_z} = 15\frac{1}{c}$, $\omega_{CF_z} = 30\frac{1}{c}$, $AB = 10$, $BC = 6$, $DE = 4$, $OA = CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

Задача 25.6. 3



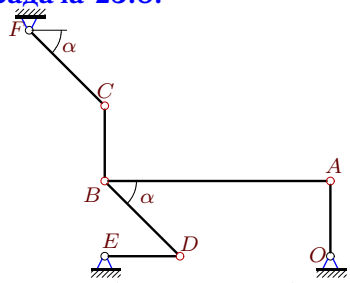
$\omega_{OA_z} = -5\frac{1}{c}$, $\omega_{DE_z} = 15\frac{1}{c}$, $AB = 5$, $BC = 1$, $DE = 3$, $OA = 3$, $CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

Задача 25.7. 3



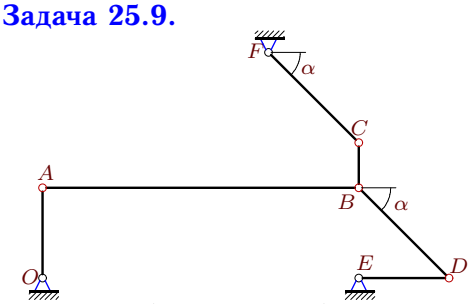
$\omega_{OA_z} = -3\frac{1}{c}$, $\omega_{CF_z} = 3\frac{1}{c}$, $AB = 2$, $BC = 3$, $DE = 2$, $OA = CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.8. 3



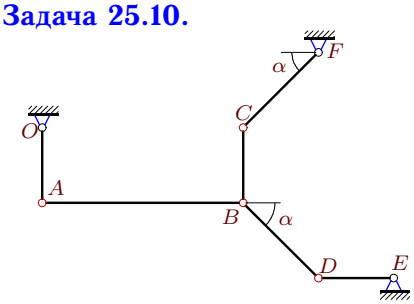
$\omega_{OA_z} = 3\frac{1}{c}$, $\omega_{CF_z} = -6\frac{1}{c}$, $AB = 9$, $BC = 3$, $DE = 3$, $OA = 3$, $CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

Задача 25.9. 3



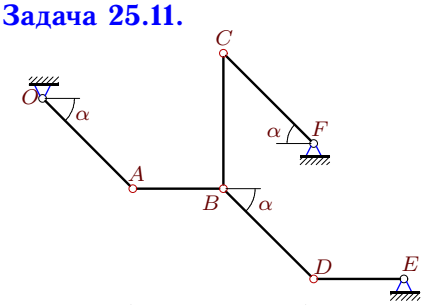
$\omega_{OA_z} = -7\frac{1}{c}$, $\omega_{DE_z} = 21\frac{1}{c}$, $AB = 7$, $BC = 1$,
$DE = 2$, $OA = 2$, $CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.10. 3



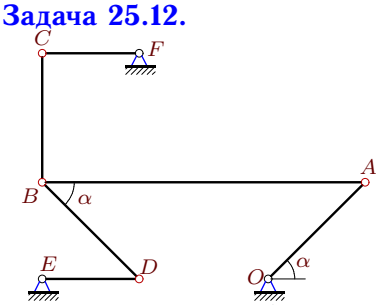
$\omega_{OA_z} = \omega_{CF_z} = 8\frac{1}{c}$, $AB = 8$, $BC = 3$,
$DE = 3$, $OA = 3$, $CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

Задача 25.11. 3



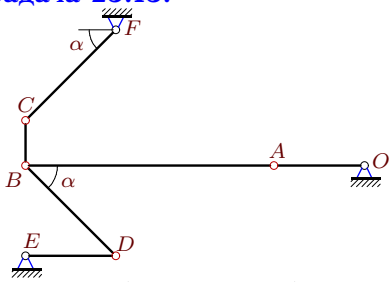
$\omega_{OA_z} = 3\frac{1}{c}$, $\omega_{CF_z} = -9\frac{1}{c}$, $AB = 2$, $BC = 3$,
$DE = 2$, $OA = CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.12. 3



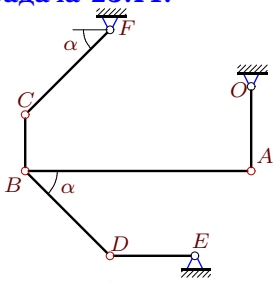
$\omega_{OA_z} = \omega_{DE_z} = -20\frac{1}{c}$, $AB = 10$, $BC = 4$,
$DE = 3$, $CF = 3$, $OA = BD = 3\sqrt{2}$, $\alpha = 45°$.

Задача 25.13. 3



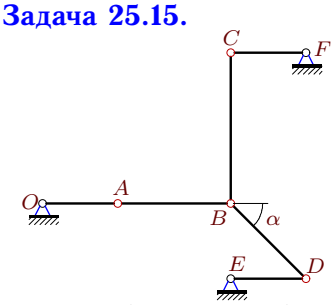
$\omega_{OA_z} = 11\frac{1}{c}$, $\omega_{CF_z} = 22\frac{1}{c}$, $AB = 11$, $BC = 2$,
$DE = 4$, $OA = 4$, $CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

Задача 25.14. 3



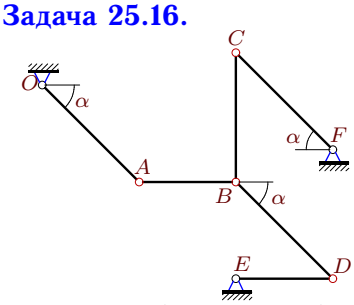
$\omega_{CF_z} = 8\frac{1}{c}$, $\omega_{DE_z} = -4\frac{1}{c}$, $AB = 8$, $BC = 2$,
$DE = 3$, $OA = 3$, $CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

Задача 25.15. 3



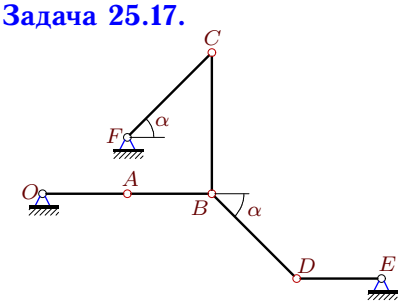
$\omega_{OA_z} = 3\frac{1}{c}$, $\omega_{DE_z} = 9\frac{1}{c}$, $AB = 3$, $BC = 4$,
$DE = 2$, $OA = 2$, $CF = 2$, $BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.16. 3



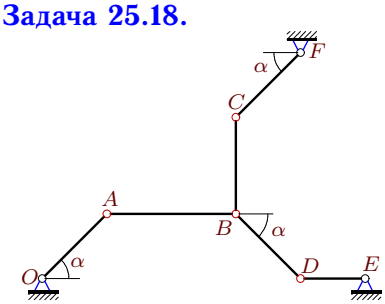
$\omega_{CF_z} = -12\frac{1}{c}$, $\omega_{DE_z} = 4\frac{1}{c}$, $AB = 3$, $BC = 4$,
$DE = 3$, $OA = CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

Задача 25.17. 3



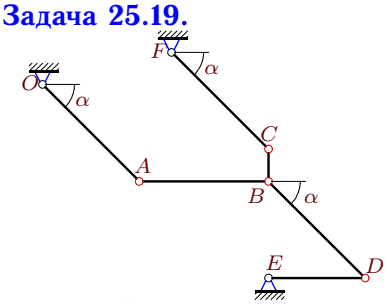
$\omega_{OA_z} = \omega_{CF_z} = 5\frac{1}{c}$, $AB = 3$, $BC = 5$,
$DE = 3$, $OA = 3$, $CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

Задача 25.18. 3



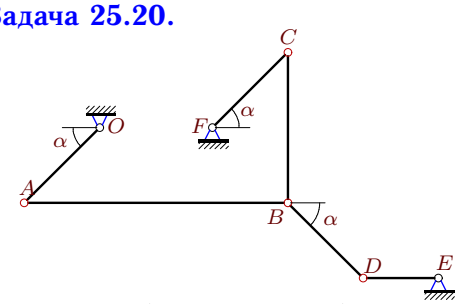
$\omega_{CF_z} = -4\frac{1}{c}$, $\omega_{DE_z} = -2\frac{1}{c}$, $AB = 4$, $BC = 3$,
$DE = 2$, $OA = CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.19. 3



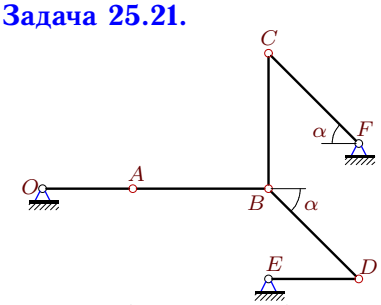
$\omega_{CF_z} = 8\frac{1}{c}$, $\omega_{DE_z} = 4\frac{1}{c}$, $AB = 4$, $BC = 1$,
$DE = 3$, $OA = CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

Задача 25.20. 3



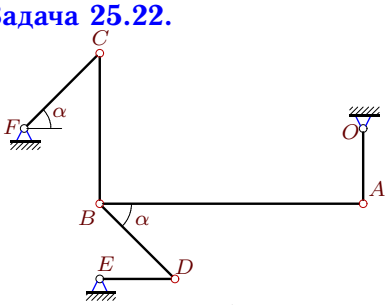
$\omega_{OA_z} = -14\frac{1}{c}$, $\omega_{DE_z} = -42\frac{1}{c}$, $AB = 7$, $BC = 4$,
$DE = 2$, $OA = CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.21. 3



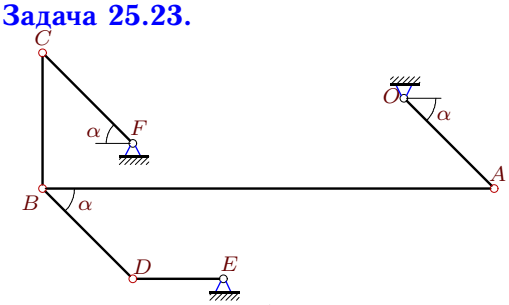
$\omega_{OA_z} = 3\frac{1}{c}$, $\omega_{DE_z} = 9\frac{1}{c}$, $AB = 3$, $BC = 3$,
$DE = 2$, $OA = 2$, $CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.22. 3



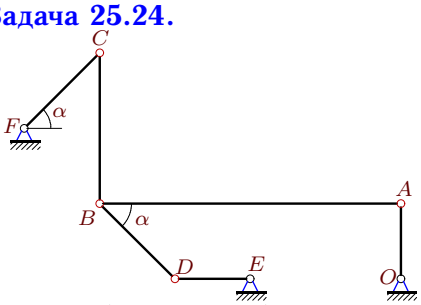
$\omega_{OA_z} = \omega_{DE_z} = 14\frac{1}{c}$, $AB = 7$, $BC = 4$,
$DE = 2$, $OA = 2$, $CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.23. 3



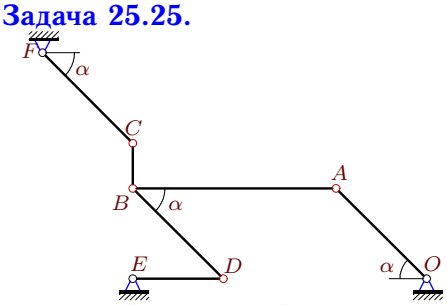
$\omega_{OA_z} = \omega_{CF_z} = -15\frac{1}{c}$, $AB = 10$, $BC = 3$,
$DE = 2$, $OA = CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.24. 3



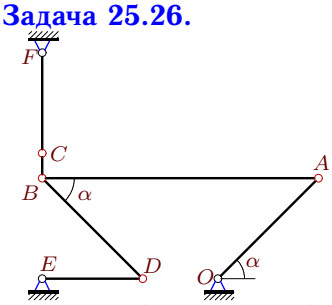
$\omega_{CF_z} = 4\frac{1}{c}$, $\omega_{DE_z} = 2\frac{1}{c}$, $AB = 8$, $BC = 4$,
$DE = 2$, $OA = 2$, $CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.25. 3



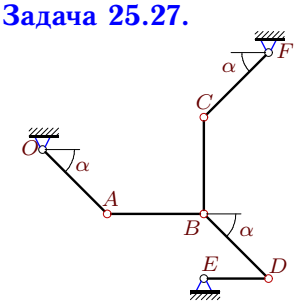
$\omega_{OA_z} = 3\frac{1}{c}$, $\omega_{CF_z} = 6\frac{1}{c}$, $AB = 9$, $BC = 2$,
$DE = 4$, $OA = CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

Задача 25.26. 3



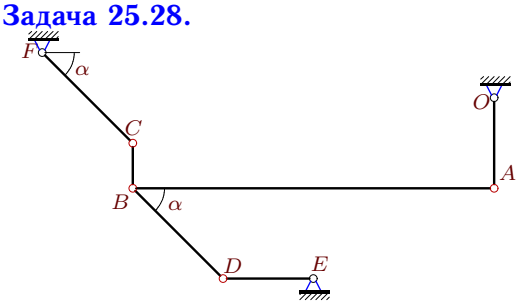
$\omega_{OA_z} = 11\frac{1}{c}$, $\omega_{CF_z} = 22\frac{1}{c}$, $AB = 11$, $BC = 1$,
$DE = 4$, $CF = 4$, $OA = BD = 4\sqrt{2}$, $\alpha = 45°$.

Задача 25.27. 3



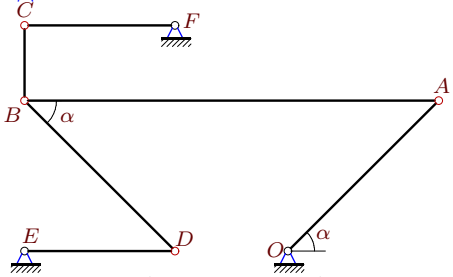
$\omega_{CF_z} = -3\frac{1}{c}$, $\omega_{DE_z} = 3\frac{1}{c}$, $AB = 3$, $BC = 3$,
$DE = 2$, $OA = CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.28. 3



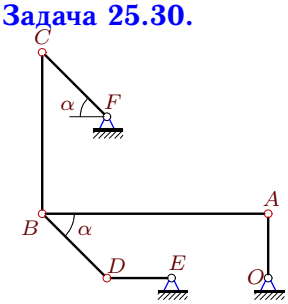
$\omega_{CF_z} = -12\frac{1}{c}$, $\omega_{DE_z} = -4\frac{1}{c}$, $AB = 8$, $BC = 1$,
$DE = 2$, $OA = 2$, $CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.29. 3



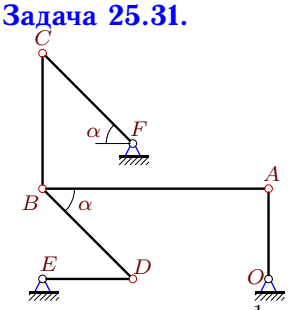
$\omega_{OA_z} = -11\frac{1}{c}$, $\omega_{DE_z} = 11\frac{1}{c}$, $AB = 11$, $BC = 2$, $DE = 4$, $CF = 4$, $OA = BD = 4\sqrt{2}$, $\alpha = 45°$.

Задача 25.30. 3



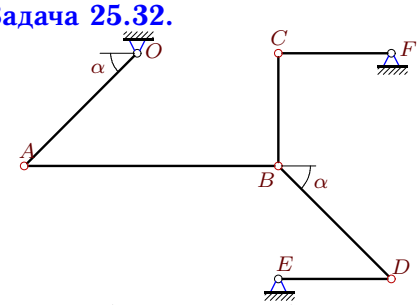
$\omega_{OA_z} = \omega_{DE_z} = 35\frac{1}{c}$, $AB = 7$, $BC = 5$, $DE = 2$, $OA = 2$, $CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

Задача 25.31. 3



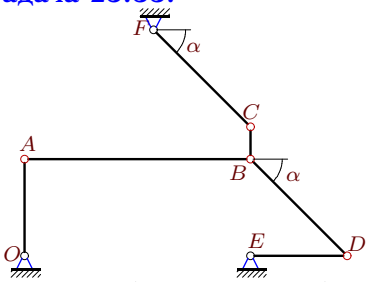
$\omega_{OA_z} = \omega_{DE_z} = -3\frac{1}{c}$, $AB = 10$, $BC = 6$, $DE = 4$, $OA = 4$, $CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

Задача 25.32. 3



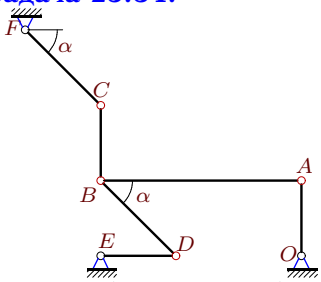
$\omega_{OA_z} = 1\frac{1}{c}$, $\omega_{DE_z} = -2\frac{1}{c}$, $AB = 9$, $BC = 4$, $DE = 4$, $CF = 4$, $OA = BD = 4\sqrt{2}$, $\alpha = 45°$.

Задача 25.33. 3



$\omega_{OA_z} = -7\frac{1}{c}$, $\omega_{CF_z} = -21\frac{1}{c}$, $AB = 7$, $BC = 1$, $DE = 3$, $OA = 3$, $CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

Задача 25.34. 3



$\omega_{OA_z} = 8\frac{1}{c}$, $\omega_{CF_z} = 24\frac{1}{c}$, $AB = 8$, $BC = 3$, $DE = 3$, $OA = 3$, $CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

25.3

Механизм с двумя степенями свободы

№	ω_{OA}	ω_{AB}	ω_{BC}	ω_{FC}	ω_{DB}	ω_{DE}
1	4	2	−1	–	4	–
2	−27	−8	−30	–	27	–
3	−4	5	−4	–	−4	–
4	–	4	−8	9	−3	–
5	–	18	10	–	15	−45
6	–	−6	45	−15	0	–
7	–	0	−4	–	3	0
8	–	2	3	–	3	−3
9	–	8	−42	28	−7	–
10	–	−3	0	–	−8	16
11	–	6	−4	–	−3	−6
12	–	−6	15	0	−20	–
13	–	4	−44	–	0	−22
14	−12	3	−30	–	12	–
15	–	4	0	−9	0	–
16	8	4	−3	–	−8	–
17	–	0	3	–	0	−5
18	−2	3	4	–	−2	–
19	4	3	−12	–	−4	–
20	–	4	7	28	14	–
21	–	4	−6	−9	0	–
22	–	−8	21	28	−14	–
23	–	−6	−20	–	15	−30
24	−6	−1	5	–	−6	–
25	–	−4	−18	–	3	9
26	–	4	−132	–	11	11
27	0	2	2	–	0	–
28	−16	3	−8	–	16	–
29	–	−12	22	−22	−11	–
30	–	20	14	70	35	–
31	–	0	2	0	−3	–
32	–	0	1	1	−1	–
33	–	−9	84	–	−7	−28
34	–	−9	−32	–	8	32