

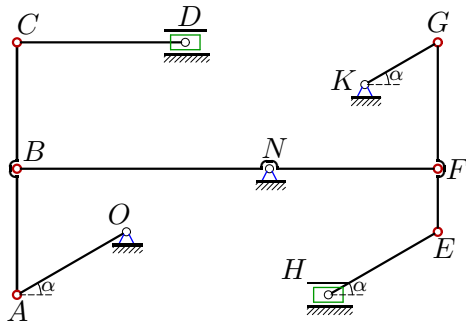
Кинематический анализ механизма (7 звеньев)

Плоский многосвязный механизм с одной степенью свободы приводится в движение кривошипом, который вращается против часовой стрелки с постоянной угловой скоростью. Найти скорости всех шарниров. Размеры даны в сантиметрах.

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

Задача К-9.1.

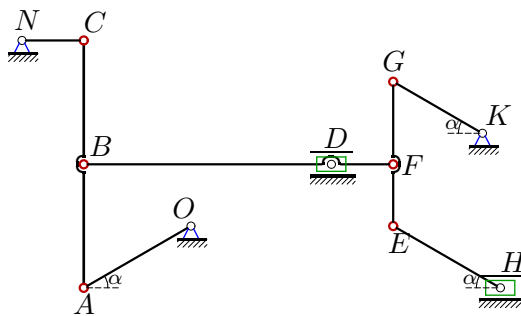
Афанасьева А.



$$\begin{aligned} \omega_{KG} &= 3 \text{ рад/с}, \alpha = 30^\circ, \\ AB &= 30, BC = 30, \\ NB &= 60, NF = 40, \\ CD &= 40, EH = 30, \\ FE &= 15, FG = 30, \\ OA &= 30, KG = 20. \end{aligned}$$

Задача К-9.2.

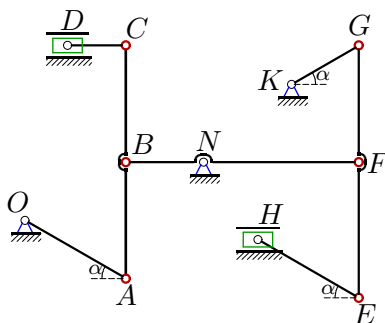
Гузенко П.



$$\begin{aligned} \omega_{OA} &= 3 \text{ рад/с}, \alpha = 30^\circ, \\ AB &= 30, BC = 30, \\ DB &= 60, DF = 15, \\ NC &= 15, EH = 30, \\ FE &= 15, FG = 20, \\ OA &= 30, KG = 25. \end{aligned}$$

Задача К-9.3.

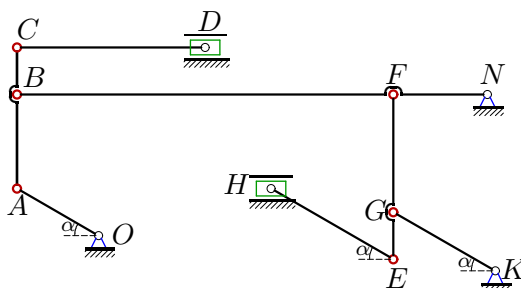
Гусева Настасья



$$\begin{aligned} \omega_{KG} &= 1 \text{ рад/с}, \alpha = 30^\circ, \\ AB &= 30, BC = 30, \\ NB &= 20, NF = 40, \\ CD &= 15, EH = 30, \\ FE &= 35, FG = 30, \\ OA &= 30, KG = 20. \end{aligned}$$

Задача К-9.4.

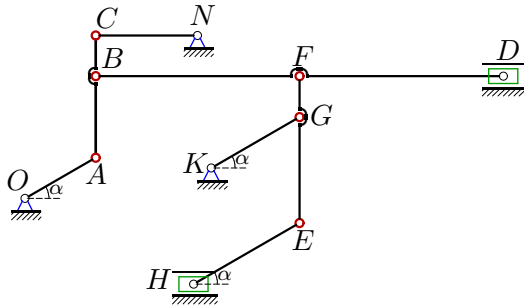
Жгун Юлия



$$\begin{aligned} \omega_{KG} &= 4 \text{ рад/с}, \alpha = 30^\circ, \\ AB &= 20, BC = 10, \\ BF &= 80, NF = 20, \\ CD &= 40, EH = 30, \\ FG &= 25, GE = 10, \\ OA &= 20, KG = 25. \end{aligned}$$

Задача К-9.5.

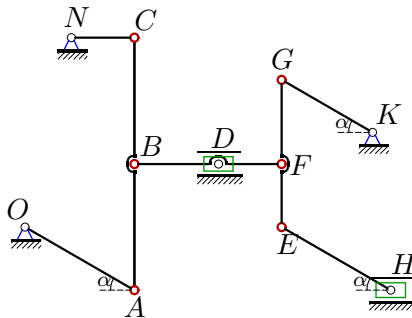
Захаров А.



$\omega_{NC} = 4$ рад/с, $\alpha = 30^\circ$,
 $AB = 20$, $BC = 10$,
 $BF = 50$, $FD = 50$,
 $NC = 25$, $EH = 30$,
 $FE = 36$, $FG = 10$,
 $OA = 20$, $KG = 25$.

Задача К-9.6.

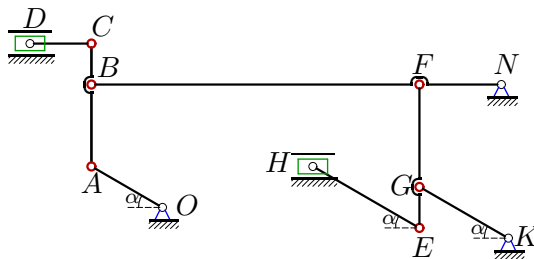
Землянухина Анна



$\omega_{NC} = 2$ рад/с, $\alpha = 30^\circ$,
 $AB = 30$, $BC = 30$,
 $DB = 20$, $DF = 15$,
 $NC = 15$, $EH = 30$,
 $FE = 15$, $FG = 20$,
 $OA = 30$, $KG = 25$.

Задача К-9.7.

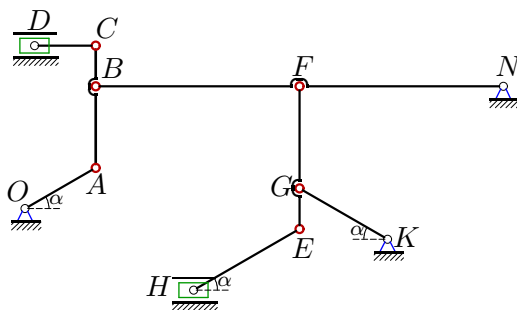
Качалкин Артем



$\omega_{NB} = 2$ рад/с, $\alpha = 30^\circ$,
 $AB = 20$, $BC = 10$,
 $BF = 80$, $NF = 20$,
 $CD = 15$, $EH = 30$,
 $FG = 25$, $GE = 10$,
 $OA = 20$, $KG = 25$.

Задача К-9.8.

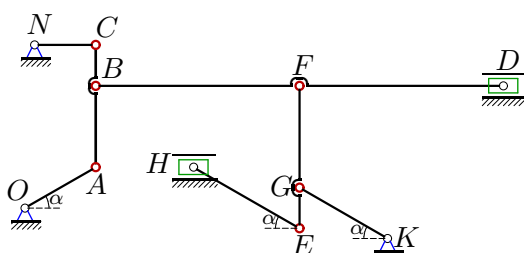
Козлова Маргарита



$\omega_{KG} = 3$ рад/с, $\alpha = 30^\circ$,
 $AB = 20$, $BC = 10$,
 $BF = 50$, $NF = 50$,
 $CD = 15$, $EH = 30$,
 $FG = 25$, $GE = 10$,
 $OA = 20$, $KG = 25$.

Задача К-9.9.

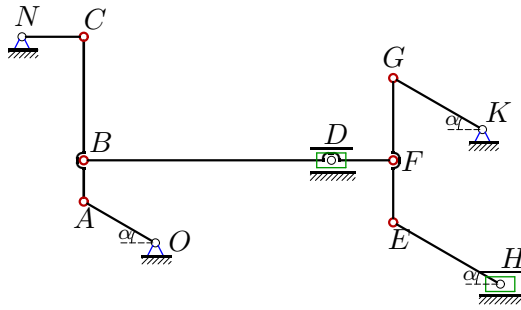
Колесников Глеб



$\omega_{NC} = 2$ рад/с, $\alpha = 30^\circ$,
 $AB = 20$, $BC = 10$,
 $BF = 50$, $FD = 50$,
 $NC = 15$, $EH = 30$,
 $FE = 35$, $FG = 25$,
 $OA = 20$, $KG = 25$.

Задача К-9.10.

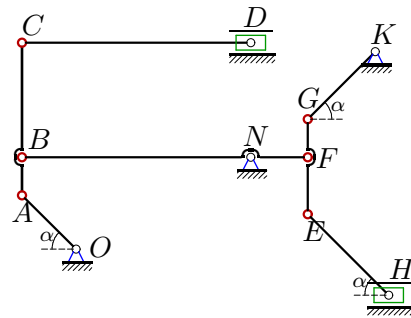
Короткин Р.



$\omega_{OA} = 4 \text{ рад/с}$, $\alpha = 30^\circ$,
 $AB = 10$, $BC = 30$,
 $DB = 60$, $DF = 15$,
 $NC = 15$, $EH = 30$,
 $FE = 15$, $FG = 20$,
 $OA = 20$, $KG = 25$.

Задача К-9.11.

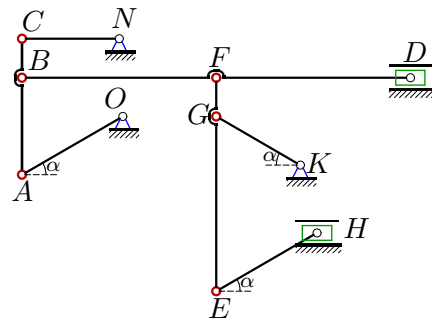
Кошелева А.



$\omega_{OA} = 4 \text{ рад/с}$, $\alpha = 45^\circ$,
 $AB = 10$, $BC = 30$,
 $NB = 60$, $NF = 15$,
 $CD = 60$, $EH = 30$,
 $FE = 15$, $FG = 10$,
 $OA = 20$, $KG = 25$.

Задача К-9.12.

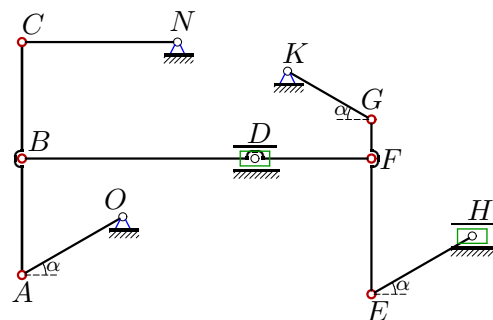
Крылов Алексей



$\omega_{OA} = 2 \text{ рад/с}$, $\alpha = 30^\circ$,
 $AB = 25$, $BC = 10$,
 $BF = 50$, $FD = 50$,
 $NC = 25$, $EH = 30$,
 $FE = 55$, $FG = 10$,
 $OA = 30$, $KG = 25$.

Задача К-9.13.

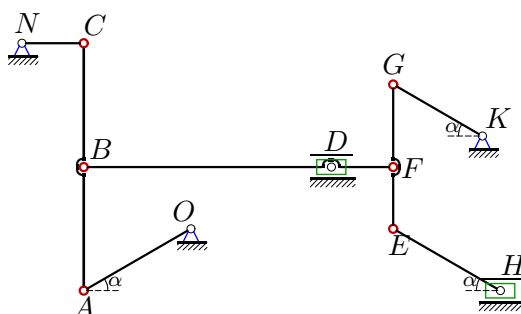
Леоненкова Х.



$\omega_{NC} = 2 \text{ рад/с}$, $\alpha = 30^\circ$,
 $AB = 30$, $BC = 30$,
 $DB = 60$, $DF = 30$,
 $NC = 40$, $EH = 30$,
 $FE = 35$, $FG = 10$,
 $OA = 30$, $KG = 25$.

Задача К-9.14.

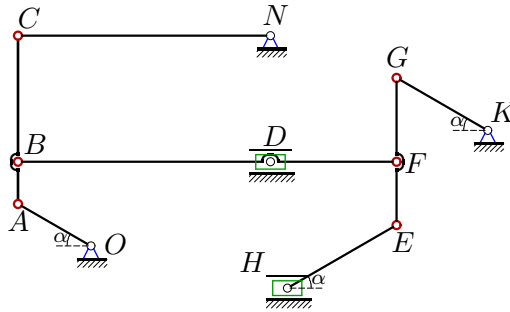
Мамедов Фамин



$\omega_{OA} = 2 \text{ рад/с}$, $\alpha = 30^\circ$,
 $AB = 30$, $BC = 30$,
 $DB = 60$, $DF = 15$,
 $NC = 15$, $EH = 30$,
 $FE = 15$, $FG = 20$,
 $OA = 30$, $KG = 25$.

Задача К-9.15.

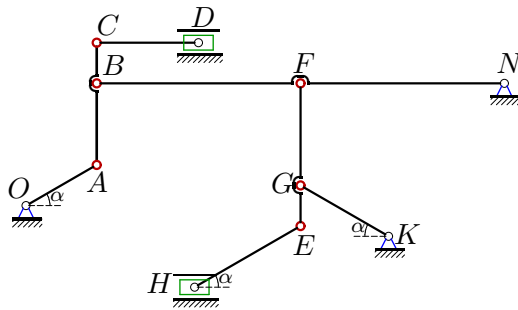
Никулина А.



$\omega_{NC} = 1$ рад/с, $\alpha = 30^\circ$,
 $AB = 10$, $BC = 30$,
 $DB = 60$, $DF = 30$,
 $NC = 60$, $EH = 30$,
 $FE = 15$, $FG = 20$,
 $OA = 20$, $KG = 25$.

Задача К-9.16.

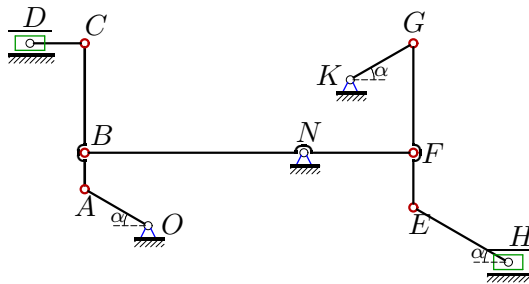
Павлов А.



$\omega_{NB} = 2$ рад/с, $\alpha = 30^\circ$,
 $AB = 20$, $BC = 10$,
 $BF = 50$, $NF = 50$,
 $CD = 25$, $EH = 30$,
 $FG = 25$, $GE = 10$,
 $OA = 20$, $KG = 25$.

Задача К-9.17.

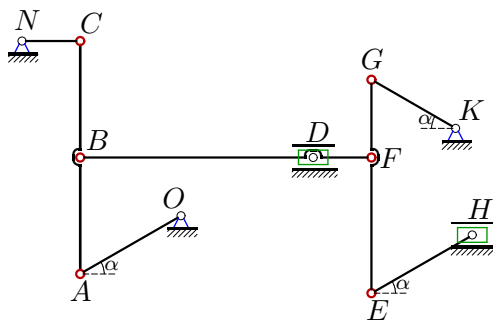
Пагин Д.



$\omega_{KG} = 2$ рад/с, $\alpha = 30^\circ$,
 $AB = 10$, $BC = 30$,
 $NB = 60$, $NF = 30$,
 $CD = 15$, $EH = 30$,
 $FE = 15$, $FG = 30$,
 $OA = 20$, $KG = 20$.

Задача К-9.18.

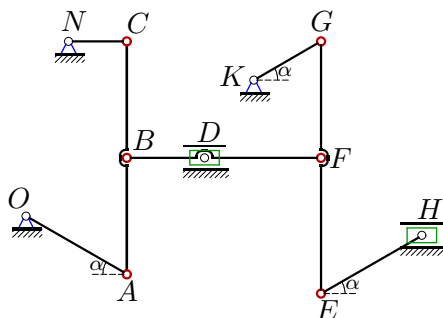
Перевозчикова Н.



$\omega_{OA} = 2$ рад/с, $\alpha = 30^\circ$,
 $AB = 30$, $BC = 30$,
 $DB = 60$, $DF = 15$,
 $NC = 15$, $EH = 30$,
 $FE = 35$, $FG = 20$,
 $OA = 30$, $KG = 25$.

Задача К-9.19.

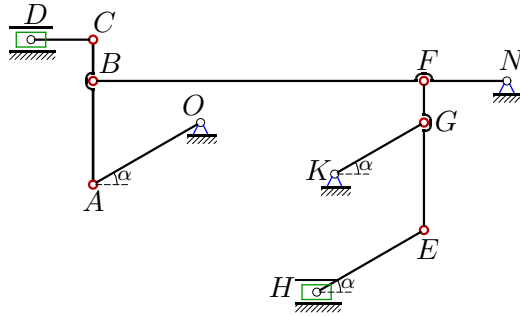
Подъячев А.



$\omega_{OA} = 2$ рад/с, $\alpha = 30^\circ$,
 $AB = 30$, $BC = 30$,
 $DB = 20$, $DF = 30$,
 $NC = 15$, $EH = 30$,
 $FE = 35$, $FG = 30$,
 $OA = 30$, $KG = 20$.

Задача К-9.20.

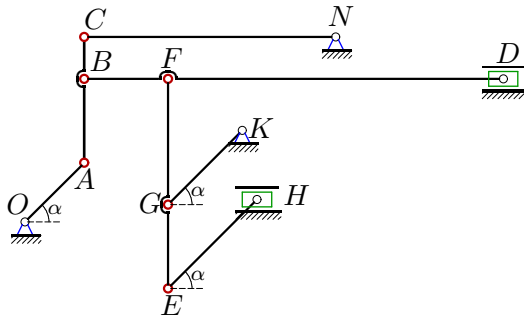
Свиргун А.



$\omega_{NB} = 2 \text{ рад/с}, \alpha = 30^\circ,$
 $AB = 25, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 15, EH = 30,$
 $FG = 10, GE = 26,$
 $OA = 30, KG = 25.$

Задача К-9.21.

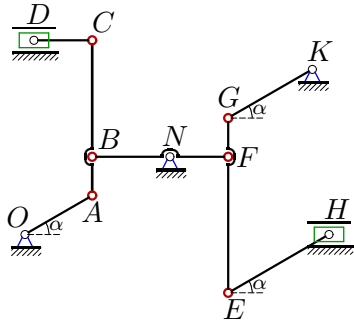
Судаков Федор



$\omega_{NC} = 4 \text{ рад/с}, \alpha = 45^\circ,$
 $AB = 20, BC = 10,$
 $BF = 20, FD = 80,$
 $NC = 60, EH = 30,$
 $FE = 50, FG = 30,$
 $OA = 20, KG = 25.$

Задача К-9.22.

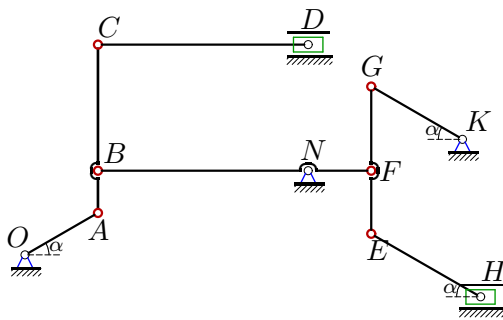
Судариков Святослав



$\omega_{OA} = 2 \text{ рад/с}, \alpha = 30^\circ,$
 $AB = 10, BC = 30,$
 $NB = 20, NF = 15,$
 $CD = 15, EH = 30,$
 $FE = 35, FG = 10,$
 $OA = 20, KG = 25.$

Задача К-9.23.

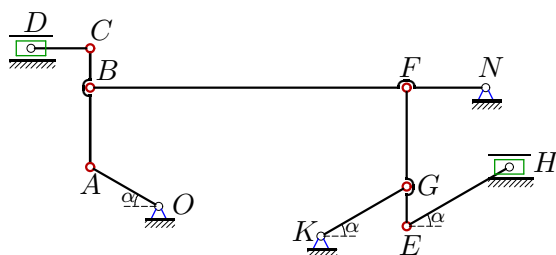
Тябут Елизавета



$\omega_{KG} = 4 \text{ рад/с}, \alpha = 30^\circ,$
 $AB = 10, BC = 30,$
 $NB = 50, NF = 15,$
 $CD = 50, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 20, KG = 25.$

Задача К-9.24.

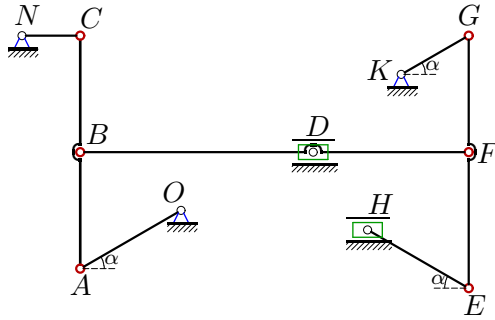
Фоменков Илья



$\omega_{KG} = 4 \text{ рад/с}, \alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 15, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Задача К-9.25.

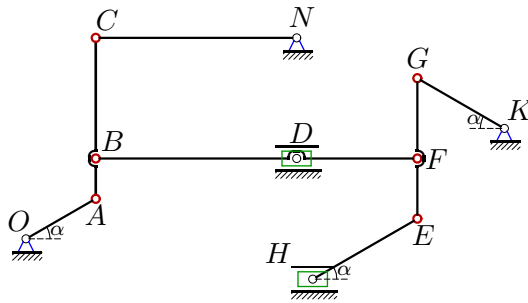
Харламов А.



$\omega_{NC} = 4$ рад/с, $\alpha = 30^\circ$,
 $AB = 30$, $BC = 30$,
 $DB = 60$, $DF = 40$,
 $NC = 15$, $EH = 30$,
 $FE = 35$, $FG = 30$,
 $OA = 30$, $KG = 20$.

Задача К-9.26.

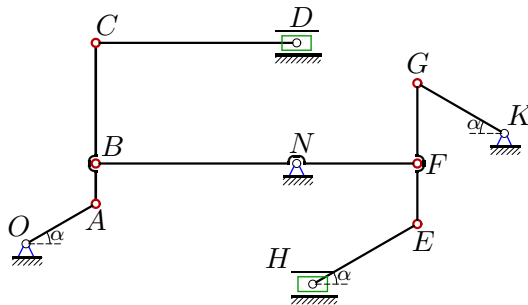
Чехранова О.



$\omega_{OA} = 2$ рад/с, $\alpha = 30^\circ$,
 $AB = 10$, $BC = 30$,
 $DB = 50$, $DF = 30$,
 $NC = 50$, $EH = 30$,
 $FE = 15$, $FG = 20$,
 $OA = 20$, $KG = 25$.

Задача К-9.27.

Широкова Мария



$\omega_{KG} = 2$ рад/с, $\alpha = 30^\circ$,
 $AB = 10$, $BC = 30$,
 $NB = 50$, $NF = 30$,
 $CD = 50$, $EH = 30$,
 $FE = 15$, $FG = 20$,
 $OA = 20$, $KG = 25$.

Ответы.

Кинематический анализ механизма (7 звеньев)

23.10.2015

№	v_A	v_B	v_C	v_D	v_E	v_F	v_G	v_H	
1	90.000	77.942	90.000	45.000	54.083	51.962	60.000	45.000	Афанасьева А.
2	90.000	81.125	77.942	22.500	36.563	29.765	22.500	19.688	Гузенко П.
3	10.000	8.660	10.000	5.000	20.883	17.321	20.000	1.667	Гусева Настасья
4	500.000	433.013	450.694	125.000	111.355	86.603	100.000	20.000	Жгун Юлия
5	115.470	101.835	100.000	19.245	73.510	53.576	57.735	25.019	Захаров А.
6	34.641	31.225	30.000	8.660	33.558	24.109	25.981	37.889	Землянухина Анна
7	230.940	200.000	208.167	57.735	51.433	40.000	46.188	9.238	Качалкин Артем
8	150.000	129.904	135.208	37.500	83.516	64.952	75.000	90.000	Козлова Маргарита
9	34.641	30.551	30.000	5.774	20.817	16.073	17.321	5.774	Колесников Глеб
10	80.000	75.498	69.282	30.000	62.450	34.641	20.000	70.000	Короткин Р.
11	80.000	56.569	178.885	169.706	25.495	14.142	20.000	7.071	Кошелева А.
12	60.000	52.664	51.962	8.571	123.828	27.358	30.000	136.071	Крылов Алексей
13	92.376	83.267	80.000	23.094	46.188	46.188	46.188	46.188	Леоненкова Х.
14	60.000	54.083	51.962	15.000	24.375	19.843	15.000	13.125	Мамедов Фамин
15	69.282	65.383	60.000	25.981	65.705	39.686	34.641	41.136	Никулина А.
16	230.940	200.000	208.167	57.735	128.582	100.000	115.470	138.564	Павлов А.
17	80.000	69.282	138.564	120.000	36.056	34.641	40.000	10.000	Пагин Д.
18	60.000	54.083	51.962	15.000	30.980	19.843	15.000	35.625	Перевозчикова Н.
19	60.000	54.083	51.962	15.000	80.467	79.373	90.000	65.000	Подъячев А.
20	230.940	200.000	205.264	46.188	92.261	40.000	46.188	60.044	Свиргун А.
21	339.411	252.982	240.000	80.000	328.596	208.000	271.529	74.667	Судаков Федор
22	40.000	34.641	69.282	60.000	58.577	25.981	30.000	67.500	Судариков Святослав
23	333.333	288.675	577.350	500.000	94.373	86.603	100.000	87.500	Тябут Елизавета
24	500.000	433.013	450.694	125.000	111.355	86.603	100.000	20.000	Фоменков Илья
25	69.282	62.450	60.000	17.321	75.871	43.589	46.188	41.377	Харламов А.
26	40.000	37.749	34.641	15.000	27.010	25.632	24.000	29.250	Чехранова О.
27	83.333	72.169	144.338	125.000	47.186	43.301	50.000	6.250	Широкова Мария

К-9 файл о9kdaA

№	ω_{OA}	ω_{CA}	ω_{CD}	ω_{BF}	ω_{FE}	ω_{KG}	ω_{EH}	ω_{NC}	a_A	a_B	a_C	a_E	a_F	a_G
1	3.000	1.500	1.949	1.299	1.000	3.000	2.000	-	-	-	-	0.507	0.903	1.800
2	3.000	0.750	-	1.299	0.563	-0.900	-0.750	-5.196	2.700	1.459	4.175	-	-	-
3	-0.333	-0.167	-0.577	0.433	0.333	1.000	0.667	-	-	-	-	0.048	0.100	0.200
4	25.000	-12.500	10.825	4.330	-2.000	4.000	-3.333	-	-	-	-	3.712	4.802	4.000
5	-5.774	1.925	-	1.000	0.962	-2.309	-1.925	4.000	8.413	0.387	4.000	-	-	-
6	1.155	0.289	-	-1.500	1.083	1.039	0.866	2.000	0.436	0.517	0.600	-	-	-
7	11.547	-5.774	-13.333	2.000	-0.924	1.848	-1.540	-	35.277	4.000	11.801	-	-	-
8	-7.500	3.750	-8.660	1.299	-1.500	3.000	-2.500	-	-	-	-	2.554	1.887	2.250
9	1.732	-0.577	-	-0.300	0.577	-0.693	0.577	2.000	0.757	0.651	0.600	-	-	-
10	4.000	-1.000	-	1.155	-2.000	-0.800	-0.667	-4.619	3.200	2.127	3.774	-	-	-
11	4.000	-5.657	0.943	0.943	1.414	-0.800	-0.667	-	3.200	5.489	15.766	-	-	-
12	2.000	0.857	-	0.520	-2.357	1.200	1.000	2.078	1.200	1.147	1.133	-	-	-
13	3.079	0.770	-	1.333	-0.000	1.848	-1.540	2.000	3.100	2.346	1.600	-	-	-
14	2.000	0.500	-	0.866	0.375	-0.600	-0.500	-3.464	1.200	0.648	1.855	-	-	-
15	3.464	-0.866	-	1.000	-2.165	-1.386	1.155	1.000	2.960	2.369	0.600	-	-	-
16	-11.547	5.774	8.000	2.000	-2.309	4.619	-3.849	-	35.277	4.000	23.558	-	-	-
17	4.000	-4.000	-4.619	1.155	0.667	2.000	-1.333	-	-	-	-	0.323	0.481	0.800
18	2.000	0.500	-	0.866	0.375	-0.600	-0.500	-3.464	1.200	0.648	1.855	-	-	-
19	2.000	0.500	-	-2.598	-1.000	-4.500	3.000	3.464	1.200	1.514	1.855	-	-	-
20	7.698	4.619	-13.333	2.000	2.309	-1.848	-1.540	-	18.246	4.000	2.541	-	-	-
21	-16.971	8.000	-	2.400	3.733	10.861	9.051	4.000	102.473	27.897	9.600	-	-	-
22	2.000	-2.000	2.309	-1.732	-1.500	1.200	1.000	-	0.800	1.000	4.905	-	-	-
23	16.667	-16.667	-5.774	-5.774	2.500	4.000	3.333	-	-	-	-	11.350	5.056	4.000
24	-25.000	12.500	28.868	-4.330	-2.000	4.000	-3.333	-	-	-	-	6.548	4.802	4.000
25	-2.309	-0.577	-	-1.000	-1.347	-2.309	-1.540	4.000	1.744	0.349	2.400	-	-	-
26	2.000	-0.500	-	-0.693	-0.150	0.960	-0.800	-0.693	0.800	0.626	0.555	-	-	-
27	4.167	-4.167	-1.443	-1.443	1.250	2.000	-1.667	-	-	-	-	1.744	0.653	1.000