

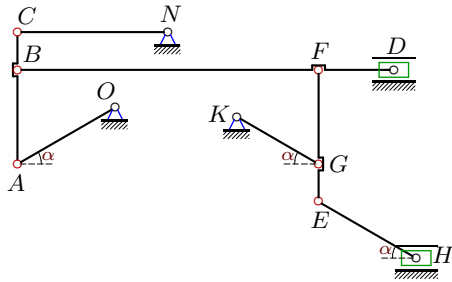
Скорости точек многосвязного механизма

Плоский многосвязный механизм с одной степенью свободы приводится в движение кривошипом, который вращается против часовой стрелки с постоянной угловой скоростью. Найти скорости точек механизма (в см/с) и угловые скорости его звеньев (в рад/с). Размеры даны в см.

Кирсанов М.Н. Решебник. Теоретическая механика с. 158.

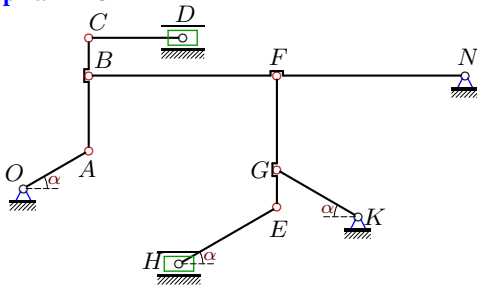
<p>Вариант 1</p>	$\omega_{NC} = 1 \text{ рад/с,}$ $\alpha = 30^\circ,$ $AB = 20, BC = 10,$ $BF = 80, FD = 20,$ $NC = 15, EH = 30,$ $FE = 35, FG = 25,$ $OA = 20, KG = 25.$
<p>Вариант 2</p>	$\omega_{KG} = 2 \text{ рад/с,}$ $\alpha = 30^\circ,$ $AB = 30, BC = 30,$ $NB = 50, NF = 30,$ $CD = 50, EH = 30,$ $FE = 15, FG = 20,$ $OA = 30, KG = 25.$
<p>Вариант 3</p>	$\omega_{OA} = 3 \text{ рад/с,}$ $\alpha = 30^\circ,$ $AB = 20, BC = 10,$ $BF = 50, NF = 50,$ $CD = 15, EH = 30,$ $FG = 25, GE = 10,$ $OA = 20, KG = 25.$
<p>Вариант 4</p>	$\omega_{KG} = 4 \text{ рад/с,}$ $\alpha = 45^\circ,$ $AB = 30, BC = 30,$ $NB = 20, NF = 30,$ $CD = 15, EH = 30,$ $FE = 35, FG = 10,$ $OA = 30, KG = 25.$

Вариант 5



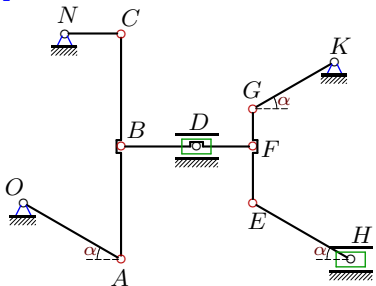
$\omega_{OA} = 5 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 25, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 40, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 30, KG = 25.$

Вариант 6



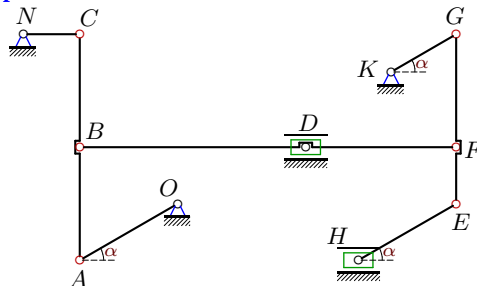
$\omega_{OA} = 6 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 25, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Вариант 7



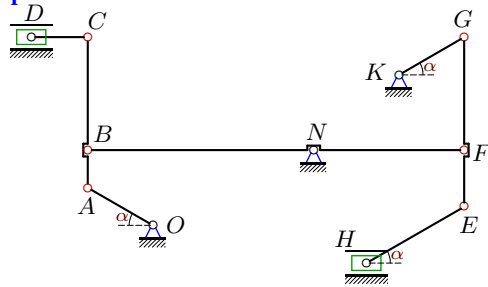
$\omega_{OA} = 7 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $DB = 20, DF = 15,$
 $NC = 15, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 8



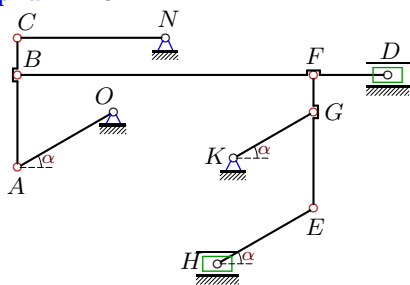
$\omega_{NC} = 8 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $DB = 60, DF = 40,$
 $NC = 15, EH = 30,$
 $FE = 15, FG = 30,$
 $OA = 30, KG = 20.$

Вариант 9



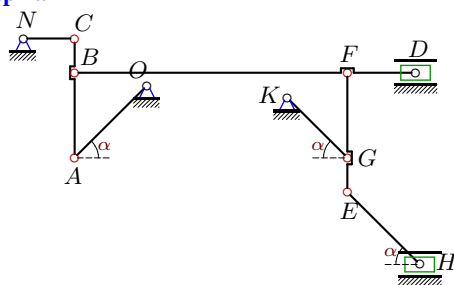
$\omega_{OA} = 9$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30,$
 $NB = 60, NF = 40,$
 $CD = 15, EH = 30,$
 $FE = 15, FG = 30,$
 $OA = 20, KG = 20.$

Вариант 10



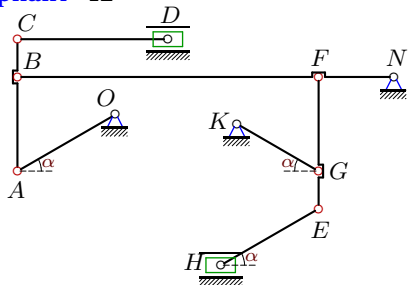
$\omega_{NC} = 10$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 40, EH = 30,$
 $FE = 36, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 11

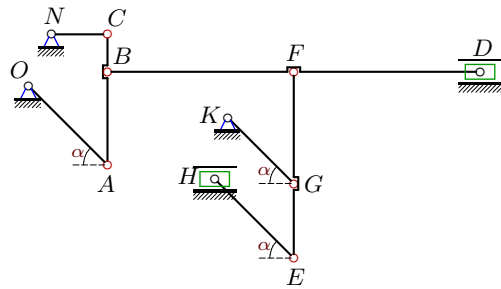


$\omega_{NC} = 11$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 25, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 30, KG = 25.$

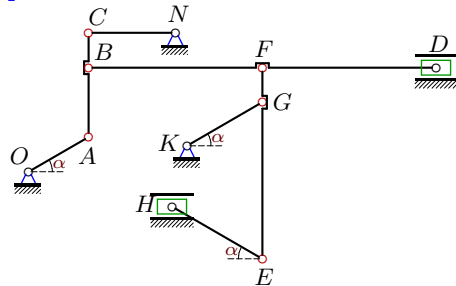
Вариант 12



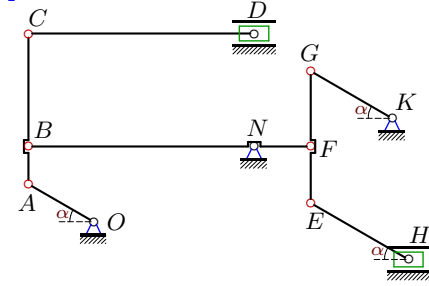
$\omega_{NB} = 12$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 40, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 30, KG = 25.$

Вариант 13

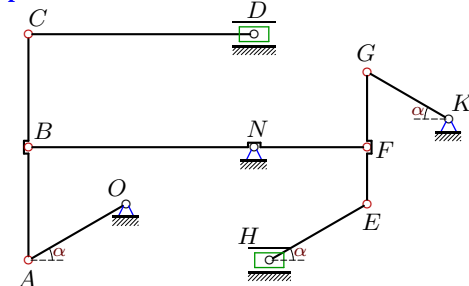
$\omega_{NC} = 13 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 25, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 15, EH = 30,$
 $FE = 50, FG = 30,$
 $OA = 30, KG = 25.$

Вариант 14

$\omega_{OA} = 14 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 25, EH = 30,$
 $FE = 55, FG = 10,$
 $OA = 20, KG = 25.$

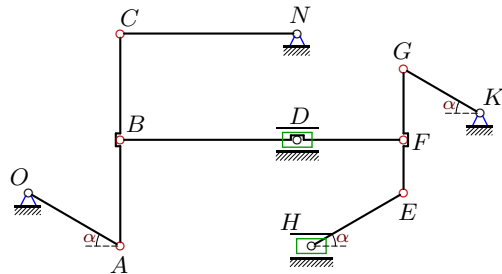
Вариант 15

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

Вариант 16

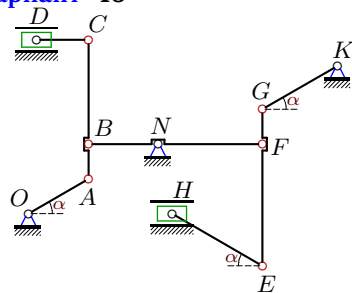
$\omega_{BF} = 16 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $NB = 60, NF = 30,$
 $CD = 60, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 30, KG = 25.$

Вариант 17



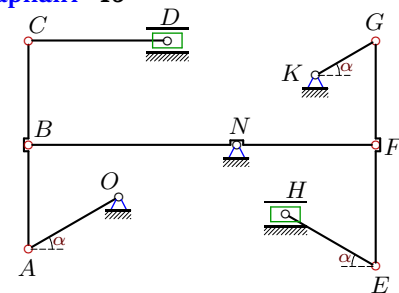
$\omega_{OA} = 17$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 30, BC = 30,$
 $DB = 50, DF = 30,$
 $NC = 50, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 30, KG = 25.$

Вариант 18



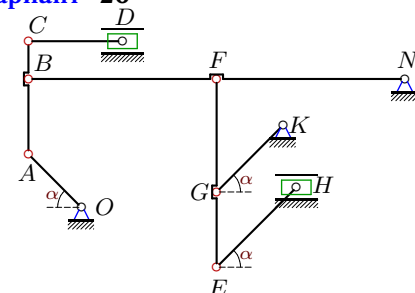
$\omega_{KG} = 18$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30,$
 $NB = 20, NF = 30,$
 $CD = 15, EH = 30,$
 $FE = 35, FG = 10,$
 $OA = 20, KG = 25.$

Вариант 19



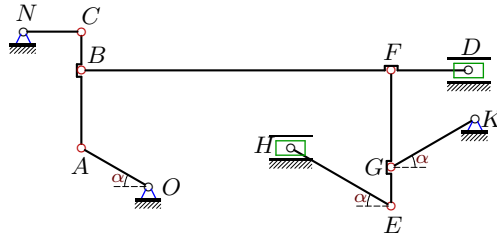
$\omega_{BF} = 19$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 30, BC = 30,$
 $NB = 60, NF = 40,$
 $CD = 40, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 30, KG = 20.$

Вариант 20



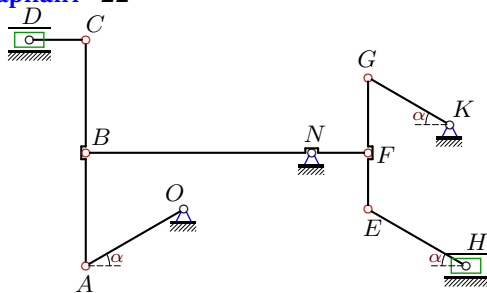
$\omega_{KG} = 20$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 20, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 25, EH = 30,$
 $FG = 30, GE = 20,$
 $OA = 20, KG = 25.$

Вариант 21



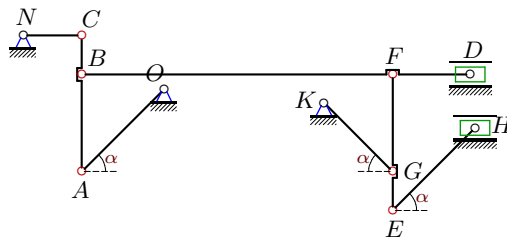
$\omega_{OA} = 21$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 20, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 20, KG = 25.$

Вариант 22



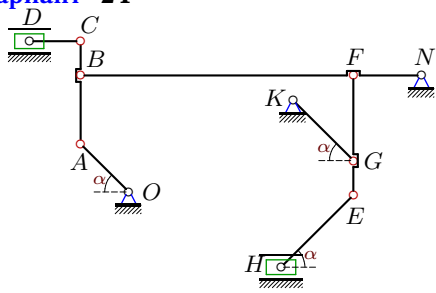
$\omega_{BF} = 22$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 30, BC = 30,$
 $NB = 60, NF = 15,$
 $CD = 15, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 30, KG = 25.$

Вариант 23



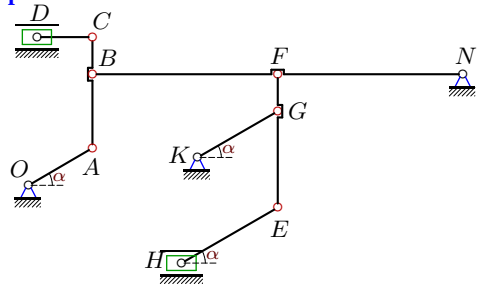
$\omega_{NC} = 23$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 25, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 30, KG = 25.$

Вариант 24



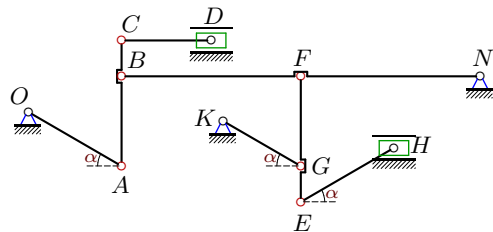
$\omega_{NB} = 24$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 20, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 15, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Вариант 25



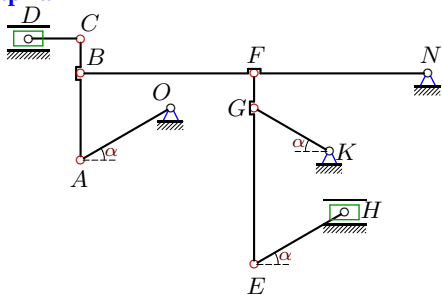
$\omega_{KG} = 25$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 20, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 15, EH = 30,$
 $FG = 10, GE = 26,$
 $OA = 20, KG = 25.$

Вариант 26



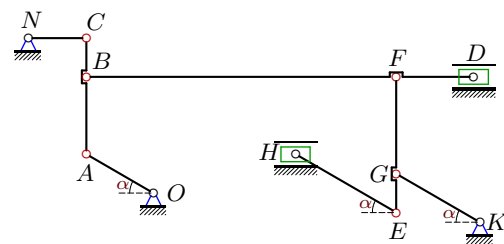
$\omega_{KG} = 26$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 25, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 30, KG = 25.$

Вариант 27



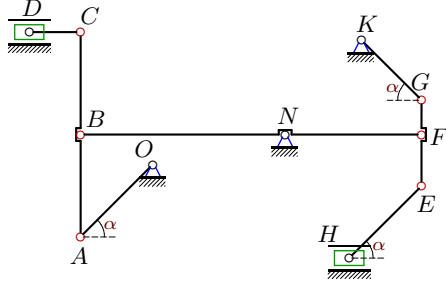
$\omega_{KG} = 27$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 15, EH = 30,$
 $FG = 10, GE = 45,$
 $OA = 30, KG = 25.$

Вариант 28



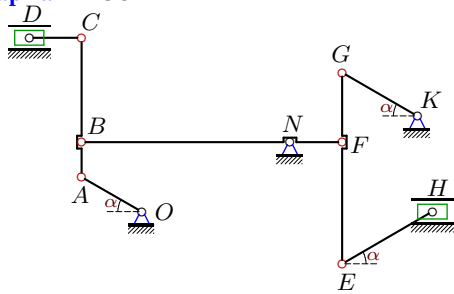
$\omega_{NC} = 28$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 20, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 20, KG = 25.$

Вариант 29



$\omega_{KG} = 29$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 30$, $BC = 30$,
 $NB = 60$, $NF = 40$,
 $CD = 15$, $EH = 30$,
 $FE = 15$, $FG = 10$,
 $OA = 30$, $KG = 25$.

Вариант 30



$\omega_{OA} = 30$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10$, $BC = 30$,
 $NB = 60$, $NF = 15$,
 $CD = 15$, $EH = 30$,
 $FE = 35$, $FG = 20$,
 $OA = 20$, $KG = 25$.

Ответы

	v_A	v_B	v_C	v_D	v_E	v_F	v_G	v_H
1	17.321	15.275	15.000	2.887	3.258	4.163	3.464	3.002
2	83.333	72.169	83.333	41.667	47.186	43.301	50.000	6.250
3	60.000	51.962	54.083	15.000	33.407	25.981	30.000	36.000
4	66.667	47.140	66.667	47.140	257.391	70.711	100.000	176.777
5	150.000	131.659	129.904	21.429	39.363	33.678	30.000	14.571
6	120.000	103.923	108.167	30.000	66.813	51.962	60.000	72.000
7	210.000	189.291	181.865	52.500	137.029	146.154	157.500	91.875
8	138.564	124.900	120.000	34.641	109.697	87.178	92.376	121.244
9	180.000	155.885	311.769	270.000	108.167	103.923	120.000	90.000
10	461.880	405.406	400.000	65.983	80.174	103.700	92.376	51.467
11	233.345	171.603	165.000	47.143	72.948	57.545	46.669	32.057
12	1385.641	1200.000	1231.584	277.128	308.597	240.000	277.128	332.554
13	275.772	202.803	195.000	55.714	158.810	112.296	137.886	27.857
14	280.000	246.937	242.487	46.667	212.897	129.915	140.000	245.000
15	1500.000	1299.038	2598.076	2250.000	353.898	324.760	375.000	328.125
16	1108.513	960.000	1108.513	554.256	523.068	480.000	554.256	69.282
17	510.000	459.708	441.673	127.500	429.403	294.080	306.000	184.875
18	300.000	259.808	519.615	450.000	878.653	389.711	450.000	562.500
19	1316.359	1140.000	1316.359	658.179	916.329	760.000	877.572	73.131
20	1000.000	707.107	790.569	353.553	687.184	353.553	500.000	235.702
21	420.000	370.405	363.731	70.000	113.253	100.955	84.000	128.800
22	1524.205	1320.000	1524.205	762.102	359.609	330.000	381.051	333.420
23	487.904	358.805	345.000	98.571	152.528	120.322	97.581	205.029
24	3394.113	2400.000	2683.282	1200.000	825.823	480.000	678.823	1152.000
25	1250.000	1082.532	1126.735	312.500	1248.437	541.266	625.000	812.500
26	1300.000	1125.833	1155.465	260.000	723.809	562.917	650.000	780.000
27	1350.000	1169.134	1199.906	270.000	1946.120	584.567	675.000	2193.750
28	484.974	427.707	420.000	80.829	91.219	116.573	96.995	12.933
29	1087.500	768.979	1087.500	768.979	924.197	512.652	725.000	256.326
30	600.000	519.615	1039.230	900.000	184.666	129.904	150.000	56.250