

Скорости точек многозвенного механизма

Плоский многозвенный 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.

Вариант 1

$\omega_{OA} = 1 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 10, BC = 30,$
 $NB = 20, NF = 15,$
 $CD = 15, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 20, KG = 25.$

Вариант 2

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

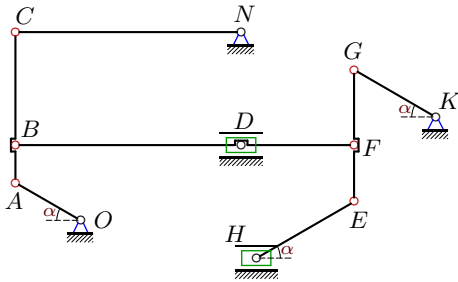
Вариант 3

$\omega_{OA} = 3 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 25, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 40, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 30, KG = 25.$

Вариант 4

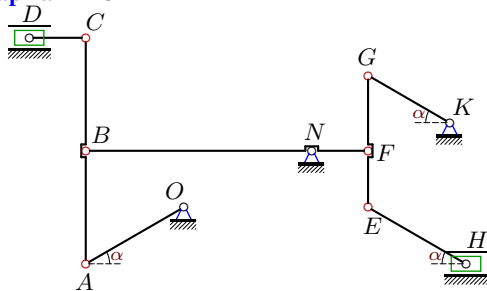
$\omega_{NB} = 4 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 25, EH = 30,$
 $FG = 10, GE = 45,$
 $OA = 20, KG = 25.$

Вариант 5



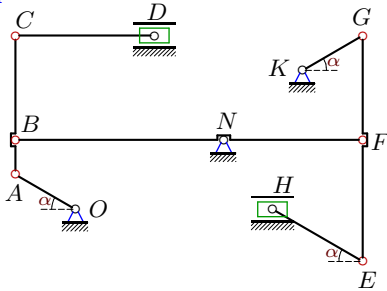
$\omega_{OA} = 5 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 10, BC = 30,$
 $DB = 60, DF = 30,$
 $NC = 60, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 20, KG = 25.$

Вариант 6



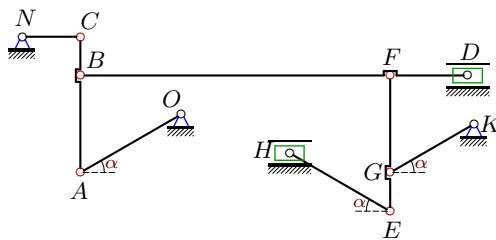
$\omega_{OA} = 6 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $NB = 60, NF = 15,$
 $CD = 15, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 30, KG = 25.$

Вариант 7



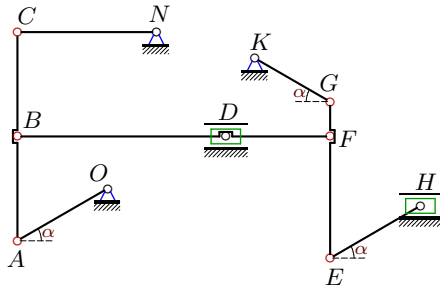
$\omega_{BF} = 7 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 10, BC = 30,$
 $NB = 60, NF = 40,$
 $CD = 40, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 20, KG = 20.$

Вариант 8



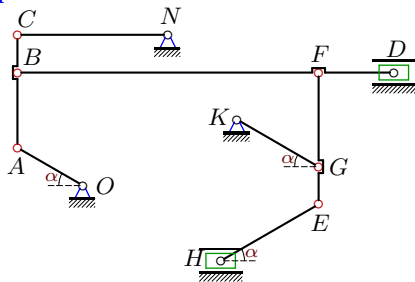
$\omega_{NC} = 8 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 25, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 30, KG = 25.$

Вариант 9



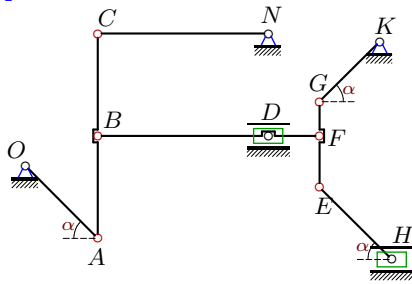
$\omega_{NC} = 9 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $DB = 60, DF = 30,$
 $NC = 40, EH = 30,$
 $FE = 35, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 10



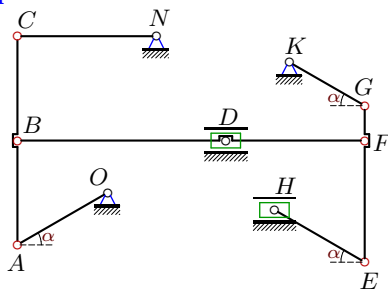
$\omega_{NC} = 10 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 40, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 20, KG = 25.$

Вариант 11



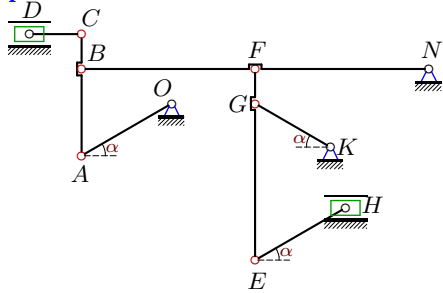
$\omega_{NC} = 11 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 30, BC = 30,$
 $DB = 50, DF = 15,$
 $NC = 50, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 12



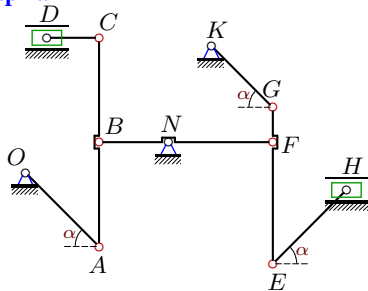
$\omega_{NC} = 12 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $DB = 60, DF = 40,$
 $NC = 40, EH = 30,$
 $FE = 35, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 13



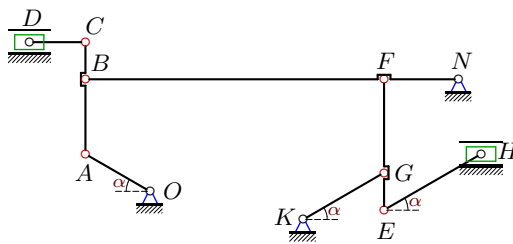
$\omega_{OA} = 13 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 25, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 15, EH = 30,$
 $FG = 10, GE = 45,$
 $OA = 30, KG = 25.$

Вариант 14



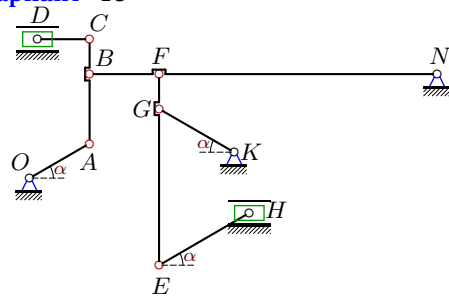
$\omega_{OA} = 14 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 30, BC = 30,$
 $NB = 20, NF = 30,$
 $CD = 15, EH = 30,$
 $FE = 35, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 15



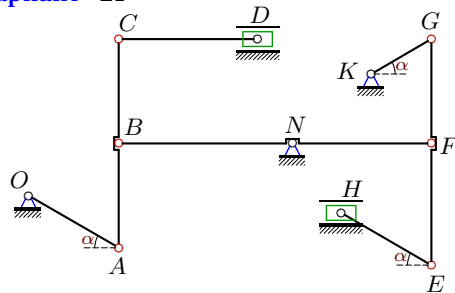
$\omega_{KG} = 15 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 15, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Вариант 16



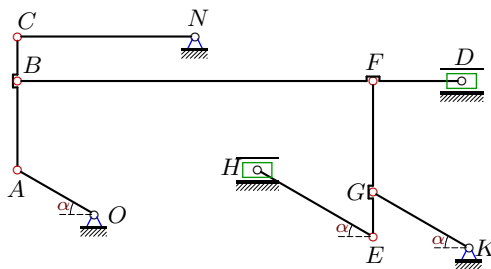
$\omega_{OA} = 16 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 20, NF = 80,$
 $CD = 15, EH = 30,$
 $FG = 10, GE = 45,$
 $OA = 20, KG = 25.$

Вариант 21



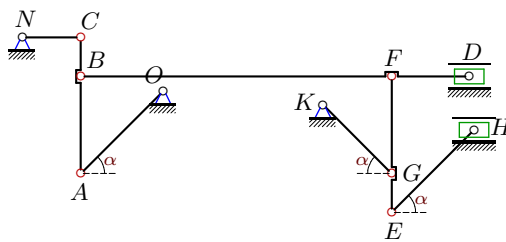
$\omega_{BF} = 21$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 30, BC = 30,$
 $NB = 50, NF = 40,$
 $CD = 40, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 30, KG = 20.$

Вариант 22



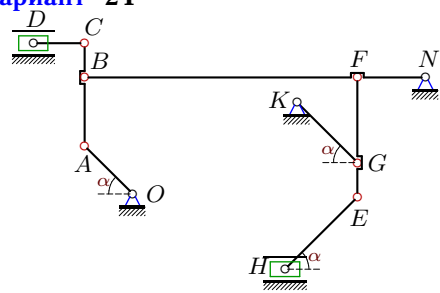
$\omega_{OA} = 22$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 20, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 40, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 20, KG = 25.$

Вариант 23



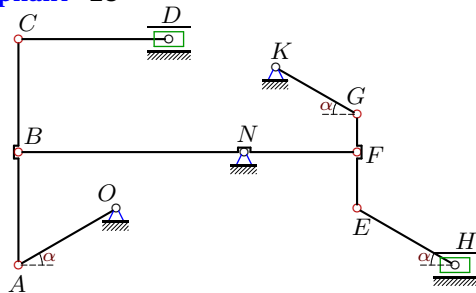
$\omega_{NC} = 23$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 25, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 30, KG = 25.$

Вариант 24



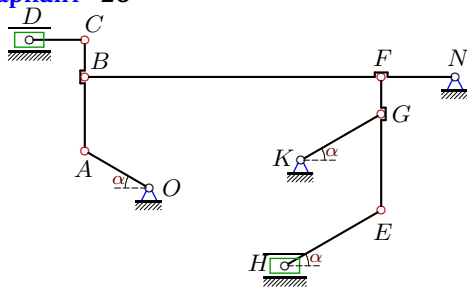
$\omega_{OA} = 24$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 20, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 15, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Вариант 25



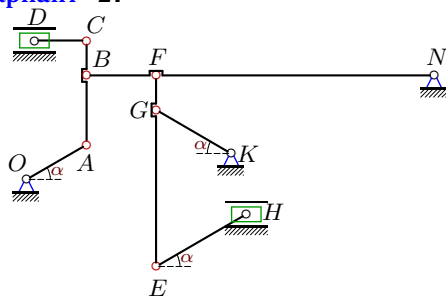
$\omega_{KG} = 25$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 30, BC = 30,$
 $NB = 60, NF = 30,$
 $CD = 40, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 26



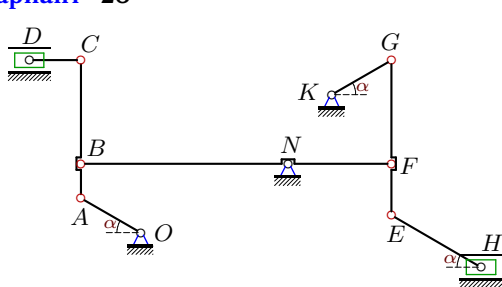
$\omega_{NB} = 26$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 20, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 15, EH = 30,$
 $FG = 10, GE = 26,$
 $OA = 20, KG = 25.$

Вариант 27



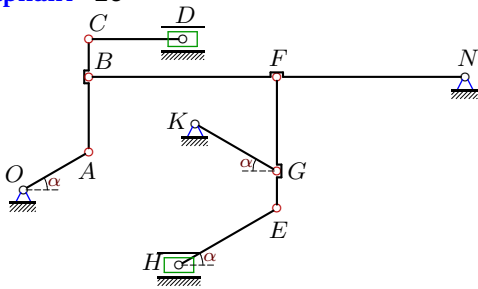
$\omega_{NB} = 27$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 20, BC = 10,$
 $BF = 20, NF = 80,$
 $CD = 15, EH = 30,$
 $FG = 10, GE = 45,$
 $OA = 20, KG = 25.$

Вариант 28



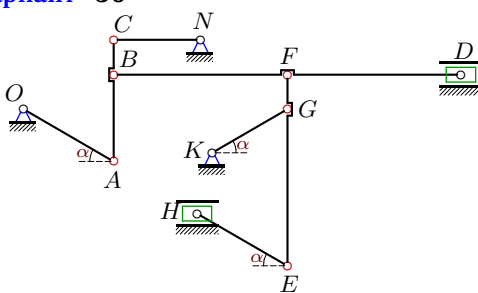
$\omega_{KG} = 28$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30,$
 $NB = 60, NF = 30,$
 $CD = 15, EH = 30,$
 $FE = 15, FG = 30,$
 $OA = 20, KG = 20.$

Вариант 29



$\omega_{OA} = 29$ 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 30



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

Ответы

	v_A	v_B	v_C	v_D	v_E	v_F	v_G	v_H
1	20.000	17.321	34.641	30.000	14.156	12.990	15.000	13.125
2	34.641	30.551	30.000	5.774	23.649	16.073	17.321	9.623
3	90.000	63.640	68.542	25.456	21.898	12.728	18.000	30.547
4	461.880	400.000	416.333	115.470	665.833	200.000	230.940	750.555
5	100.000	94.373	86.603	37.500	94.837	57.282	50.000	59.375
6	180.000	155.885	180.000	90.000	42.468	38.971	45.000	39.375
7	484.974	420.000	840.000	727.461	337.595	280.000	323.316	26.943
8	138.564	121.622	120.000	19.795	26.605	31.110	27.713	25.337
9	415.692	374.700	360.000	103.923	207.846	207.846	207.846	207.846
10	461.880	407.340	400.000	76.980	86.875	111.022	92.376	80.059
11	777.817	614.919	550.000	275.000	469.920	320.702	233.345	605.000
12	554.256	499.600	480.000	138.564	320.832	348.712	369.504	207.846
13	390.000	337.750	346.640	78.000	562.212	168.875	195.000	633.750
14	420.000	296.985	420.000	296.985	1621.562	445.477	630.000	1113.693
15	1875.000	1623.798	1690.102	468.750	417.582	324.760	375.000	75.000
16	320.000	277.128	288.444	80.000	738.084	221.703	256.000	832.000
17	785.196	707.766	680.000	196.299	1105.044	578.333	628.157	647.787
18	519.615	456.081	450.000	74.231	271.628	236.929	259.808	282.077
19	950.000	822.724	844.378	190.000	906.242	411.362	475.000	570.000
20	461.880	400.000	461.880	230.940	832.666	800.000	923.760	692.820
21	1212.436	1050.000	1212.436	606.218	1012.785	840.000	969.948	80.829
22	440.000	388.044	381.051	73.333	82.760	105.763	88.000	11.733
23	487.904	358.805	345.000	98.571	152.528	120.322	97.581	205.029
24	480.000	339.411	379.473	169.706	116.789	67.882	96.000	162.917
25	1250.000	1082.532	1250.000	625.000	716.027	541.266	625.000	781.250
26	3002.221	2600.000	2706.166	750.555	1199.387	520.000	600.444	780.578
27	3117.691	2700.000	2810.249	779.423	7190.994	2160.000	2494.153	8105.998
28	1120.000	969.948	1939.897	1680.000	504.777	484.974	560.000	140.000
29	580.000	502.295	522.805	145.000	322.930	251.147	290.000	348.000
30	900.000	789.956	779.423	128.571	1857.415	410.373	450.000	2041.071