

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.

Вариант 1

$\omega_{KG} = 1 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $NB = 60, NF = 30,$
 $CD = 15, EH = 30,$
 $FE = 15, FG = 30,$
 $OA = 30, KG = 20.$

Вариант 2

$\omega_{BF} = 2 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 30, BC = 30,$
 $NB = 50, NF = 30,$
 $CD = 50, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 30, KG = 25.$

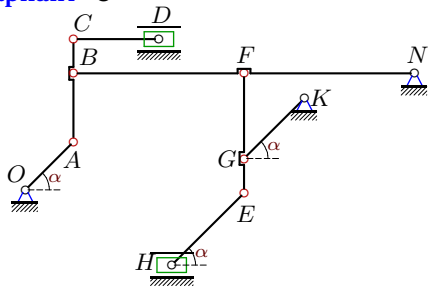
Вариант 3

$\omega_{NC} = 3 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 30, BC = 30,$
 $DB = 60, DF = 40,$
 $NC = 15, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 4

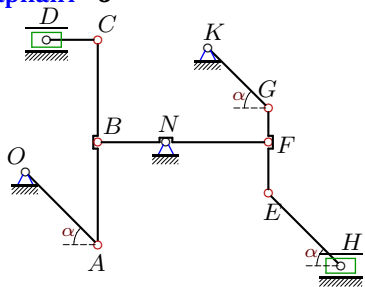
$\omega_{OA} = 4 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 25, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 25, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 30, KG = 25.$

Вариант 5



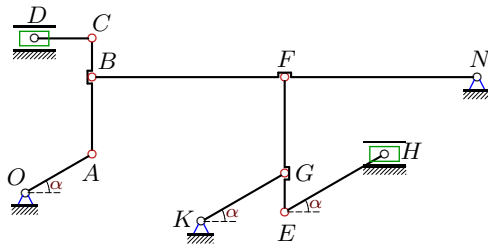
$\omega_{OA} = 5 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 20, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 25, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Вариант 6



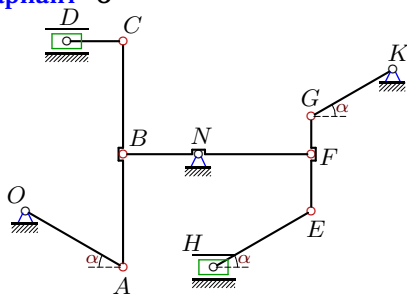
$\omega_{BF} = 6 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 30, BC = 30,$
 $NB = 20, NF = 30,$
 $CD = 15, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 7



$\omega_{KG} = 7 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 15, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Вариант 8



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

Вариант 9

$\omega_{OA} = 9 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $DB = 20, DF = 15,$
 $NC = 15, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 10

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

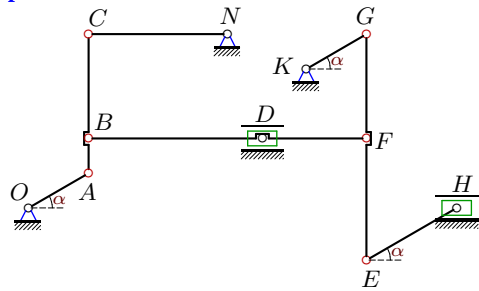
Вариант 11

$\omega_{OA} = 11 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $DB = 60, DF = 30,$
 $NC = 40, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 30, KG = 20.$

Вариант 12

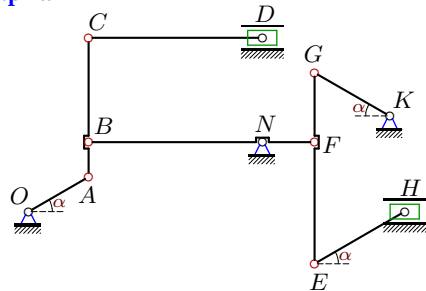
$\omega_{NB} = 12 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 40, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Вариант 13



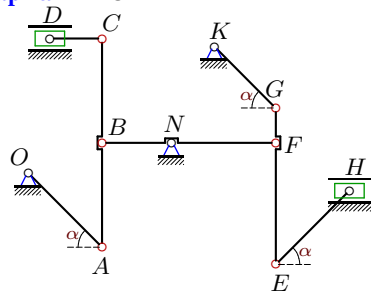
$\omega_{NC} = 13$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30,$
 $DB = 50, DF = 30,$
 $NC = 40, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 20, KG = 20.$

Вариант 14



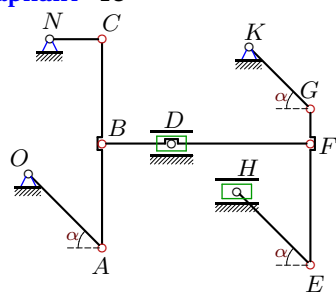
$\omega_{KG} = 14$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30,$
 $NB = 50, NF = 15,$
 $CD = 50, EH = 30,$
 $FE = 35, FG = 20,$
 $OA = 20, KG = 25.$

Вариант 15



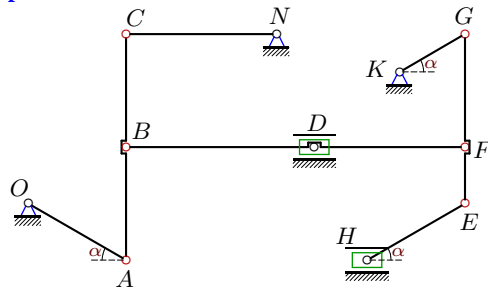
$\omega_{BF} = 15$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 30, BC = 30,$
 $NB = 20, NF = 30,$
 $CD = 15, EH = 30,$
 $FE = 35, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 16



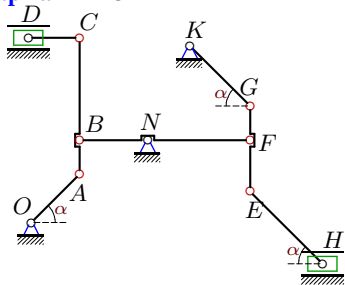
$\omega_{OA} = 16$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 30, BC = 30,$
 $DB = 20, DF = 40,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 17



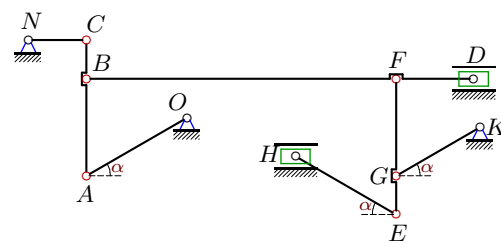
$\omega_{OA} = 17 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $DB = 50, DF = 40,$
 $NC = 40, EH = 30,$
 $FE = 15, FG = 30,$
 $OA = 30, KG = 20.$

Вариант 18



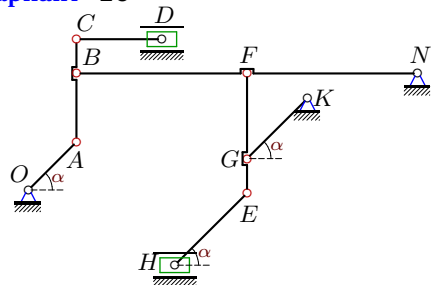
$\omega_{KG} = 18 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 10, BC = 30,$
 $NB = 20, NF = 30,$
 $CD = 15, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 20, KG = 25.$

Вариант 19



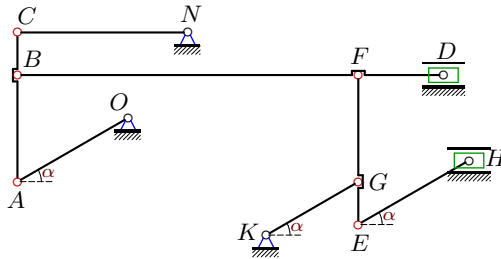
$\omega_{NC} = 19 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 25, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 30, KG = 25.$

Вариант 20



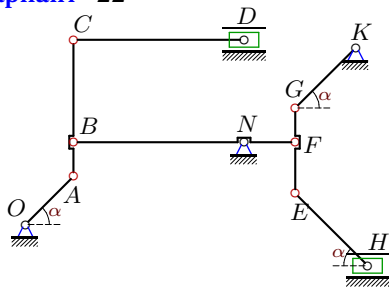
$\omega_{NB} = 20 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 20, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 25, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Вариант 21



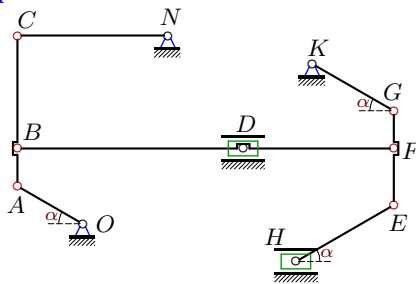
$\omega_{OA} = 21$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 40, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 30, KG = 25.$

Вариант 22



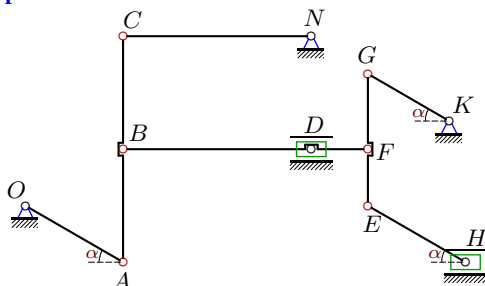
$\omega_{KG} = 22$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 10, BC = 30,$
 $NB = 50, NF = 15,$
 $CD = 50, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 20, KG = 25.$

Вариант 23



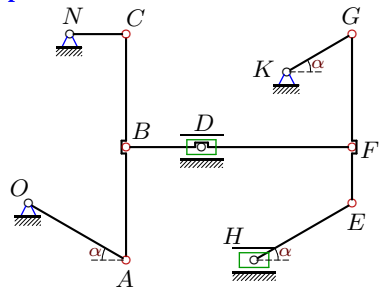
$\omega_{OA} = 23$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30,$
 $DB = 60, DF = 40,$
 $NC = 40, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 20, KG = 25.$

Вариант 24



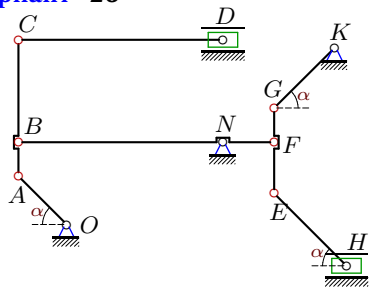
$\omega_{OA} = 24$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 30, BC = 30,$
 $DB = 50, DF = 15,$
 $NC = 50, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 30, KG = 25.$

Вариант 25



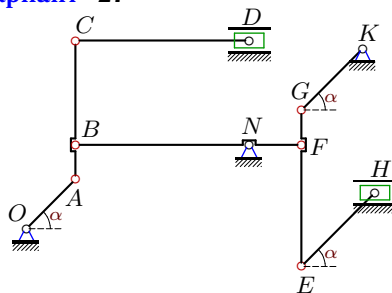
$\omega_{OA} = 25$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 30, BC = 30,$
 $DB = 20, DF = 40,$
 $NC = 15, EH = 30,$
 $FE = 15, FG = 30,$
 $OA = 30, KG = 20.$

Вариант 26



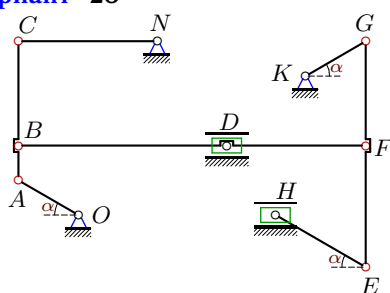
$\omega_{OA} = 26$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 10, BC = 30,$
 $NB = 60, NF = 15,$
 $CD = 60, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 20, KG = 25.$

Вариант 27



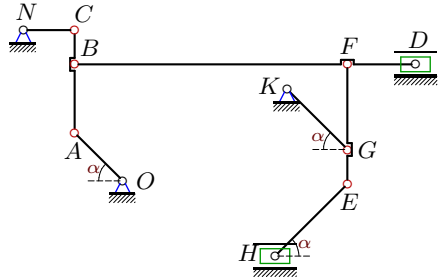
$\omega_{KG} = 27$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 10, BC = 30,$
 $NB = 50, NF = 15,$
 $CD = 50, EH = 30,$
 $FE = 35, FG = 10,$
 $OA = 20, KG = 25.$

Вариант 28



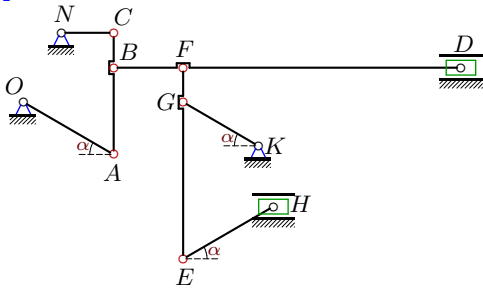
$\omega_{OA} = 28$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30,$
 $DB = 60, DF = 40,$
 $NC = 40, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 20, KG = 20.$

Вариант 29



$\omega_{OA} = 29$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 20$, $BC = 10$,
 $BF = 80$, $FD = 20$,
 $NC = 15$, $EH = 30$,
 $FE = 35$, $FG = 25$,
 $OA = 20$, $KG = 25$.

Вариант 30



$\omega_{NC} = 30$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25$, $BC = 10$,
 $BF = 20$, $FD = 80$,
 $NC = 15$, $EH = 30$,
 $FE = 55$, $FG = 10$,
 $OA = 30$, $KG = 25$.

Ответы

	v_A	v_B	v_C	v_D	v_E	v_F	v_G	v_H
1	40.000	34.641	40.000	20.000	18.028	17.321	20.000	5.000
2	141.421	100.000	141.421	100.000	108.167	60.000	84.853	150.000
3	63.640	50.312	45.000	22.500	32.040	37.500	42.426	41.250
4	120.000	103.923	106.658	24.000	66.813	51.962	60.000	12.000
5	100.000	70.711	79.057	35.355	60.828	35.355	50.000	14.142
6	169.706	120.000	169.706	120.000	324.500	180.000	254.558	450.000
7	350.000	303.109	315.486	87.500	194.872	151.554	175.000	35.000
8	184.752	160.000	184.752	92.376	317.490	240.000	277.128	346.410
9	270.000	243.375	233.827	67.500	176.180	187.912	202.500	118.125
10	300.000	212.132	300.000	212.132	1158.258	318.198	450.000	795.495
11	330.000	297.458	285.788	82.500	309.909	165.000	165.000	357.500
12	1385.641	1200.000	1249.000	346.410	308.597	240.000	277.128	55.426
13	600.444	566.657	520.000	225.167	764.572	384.765	360.267	878.150
14	1166.667	1010.363	2020.726	1750.000	430.888	303.109	350.000	131.250
15	424.264	300.000	424.264	300.000	1638.025	450.000	636.396	1125.000
16	480.000	379.473	339.411	169.706	3212.102	699.714	960.000	3818.377
17	510.000	459.708	441.673	127.500	364.436	375.638	408.000	114.750
18	300.000	212.132	670.820	636.396	573.640	318.198	450.000	795.495
19	329.090	288.852	285.000	47.013	63.186	73.886	65.818	60.176
20	2828.427	2000.000	2236.068	1000.000	1720.465	1000.000	1414.214	400.000
21	630.000	552.969	545.596	90.000	120.962	141.446	126.000	10.800
22	1833.333	1296.362	4099.458	3889.087	701.115	388.909	550.000	194.454
23	460.000	434.115	398.372	172.500	712.590	316.685	306.667	507.917
24	720.000	648.999	623.538	180.000	437.959	259.600	216.000	504.000
25	750.000	676.041	649.519	187.500	1302.417	1312.500	1500.000	843.750
26	520.000	367.696	1162.755	1103.087	165.718	91.924	130.000	45.962
27	2250.000	1590.990	5031.153	4772.971	1737.388	477.297	675.000	2147.837
28	560.000	528.488	484.974	210.000	401.008	385.530	373.333	423.889
29	580.000	432.306	410.122	136.707	101.716	159.427	116.000	142.176
30	519.615	456.081	450.000	74.231	885.589	367.573	415.692	1016.961