

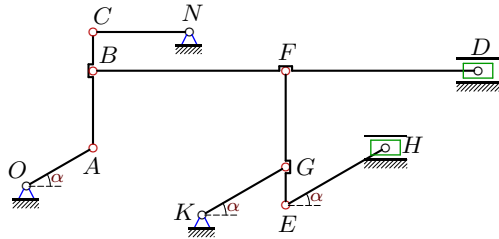
## Скорости точек многозвенного механизма

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.*

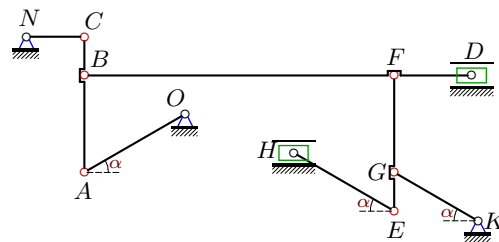
<p><b>Вариант 1</b></p>	$\omega_{OA} = 1 \text{ рад/с,}$ $\alpha = 30^\circ,$ $AB = 10, BC = 30,$ $NB = 60, NF = 30,$ $CD = 15, EH = 30,$ $FE = 35, FG = 20,$ $OA = 20, KG = 25.$
<p><b>Вариант 2</b></p>	$\omega_{KG} = 2 \text{ рад/с,}$ $\alpha = 45^\circ,$ $AB = 25, BC = 10,$ $BF = 50, NF = 50,$ $CD = 15, EH = 30,$ $FG = 25, GE = 10,$ $OA = 30, KG = 25.$
<p><b>Вариант 3</b></p>	$\omega_{BF} = 3 \text{ рад/с,}$ $\alpha = 30^\circ,$ $AB = 30, BC = 30,$ $NB = 20, NF = 30,$ $CD = 15, EH = 30,$ $FE = 35, FG = 20,$ $OA = 30, KG = 25.$
<p><b>Вариант 4</b></p>	$\omega_{BF} = 4 \text{ рад/с,}$ $\alpha = 30^\circ,$ $AB = 10, BC = 30,$ $NB = 50, NF = 30,$ $CD = 40, EH = 30,$ $FE = 15, FG = 10,$ $OA = 20, KG = 25.$

**Вариант 5**



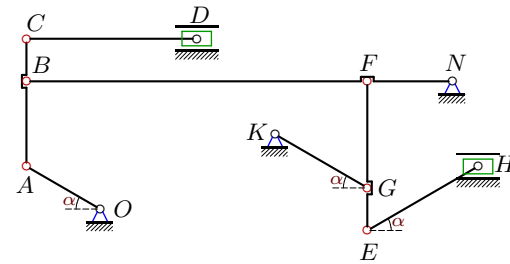
$\omega_{OA} = 5 \text{ рад/с,}$   
 $\alpha = 30^\circ,$   
 $AB = 20, BC = 10,$   
 $BF = 50, FD = 50,$   
 $NC = 25, EH = 30,$   
 $FE = 35, FG = 25,$   
 $OA = 20, KG = 25.$

**Вариант 6**



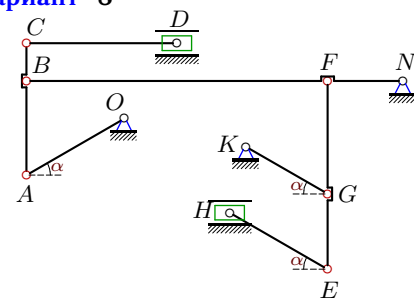
$\omega_{NC} = 6 \text{ рад/с,}$   
 $\alpha = 30^\circ,$   
 $AB = 25, BC = 10,$   
 $BF = 80, FD = 20,$   
 $NC = 15, EH = 30,$   
 $FE = 35, FG = 25,$   
 $OA = 30, KG = 25.$

**Вариант 7**



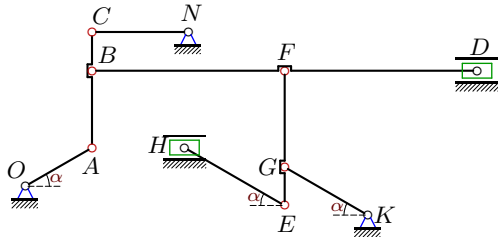
$\omega_{NB} = 7 \text{ рад/с,}$   
 $\alpha = 30^\circ,$   
 $AB = 20, BC = 10,$   
 $BF = 80, NF = 20,$   
 $CD = 40, EH = 30,$   
 $FG = 25, GE = 10,$   
 $OA = 20, KG = 25.$

**Вариант 8**



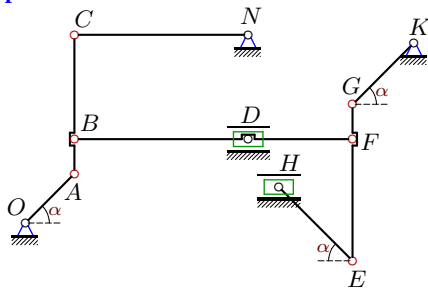
$\omega_{KG} = 8 \text{ рад/с,}$   
 $\alpha = 30^\circ,$   
 $AB = 25, BC = 10,$   
 $BF = 80, NF = 20,$   
 $CD = 40, EH = 30,$   
 $FG = 30, GE = 20,$   
 $OA = 30, KG = 25.$

**Вариант 9**



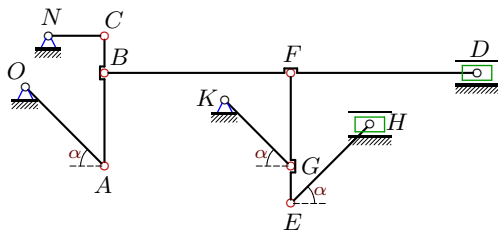
$\omega_{OA} = 9 \text{ рад/с,}$   
 $\alpha = 30^\circ,$   
 $AB = 20, BC = 10,$   
 $BF = 50, FD = 50,$   
 $NC = 25, EH = 30,$   
 $FE = 35, FG = 25,$   
 $OA = 20, KG = 25.$

**Вариант 10**



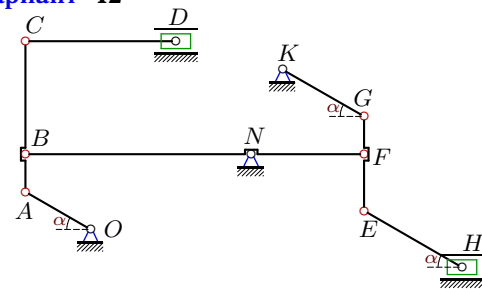
$\omega_{OA} = 10 \text{ рад/с,}$   
 $\alpha = 45^\circ,$   
 $AB = 10, BC = 30,$   
 $DB = 50, DF = 30,$   
 $NC = 50, EH = 30,$   
 $FE = 35, FG = 10,$   
 $OA = 20, KG = 25.$

**Вариант 11**



$\omega_{OA} = 11 \text{ рад/с,}$   
 $\alpha = 45^\circ,$   
 $AB = 25, BC = 10,$   
 $BF = 50, FD = 50,$   
 $NC = 15, EH = 30,$   
 $FE = 35, FG = 25,$   
 $OA = 30, KG = 25.$

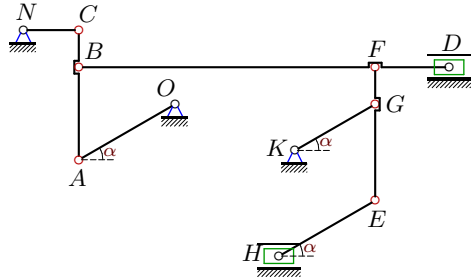
**Вариант 12**



$\omega_{KG} = 12 \text{ рад/с,}$   
 $\alpha = 30^\circ,$   
 $AB = 10, BC = 30,$   
 $NB = 60, NF = 30,$   
 $CD = 40, EH = 30,$   
 $FE = 15, FG = 10,$   
 $OA = 20, KG = 25.$

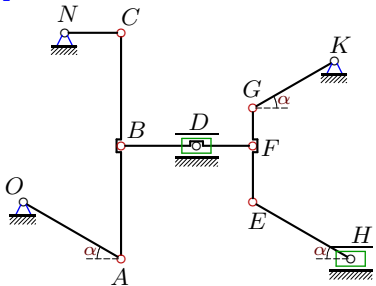


**Вариант 17**



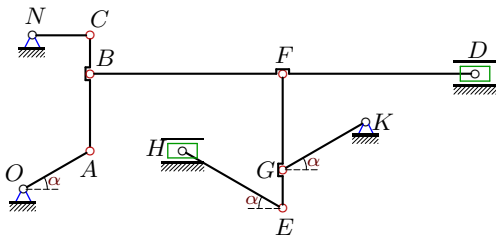
$\omega_{OA} = 17 \text{ рад/с,}$   
 $\alpha = 30^\circ,$   
 $AB = 25, BC = 10,$   
 $BF = 80, FD = 20,$   
 $NC = 15, EH = 30,$   
 $FE = 36, FG = 10,$   
 $OA = 30, KG = 25.$

**Вариант 18**



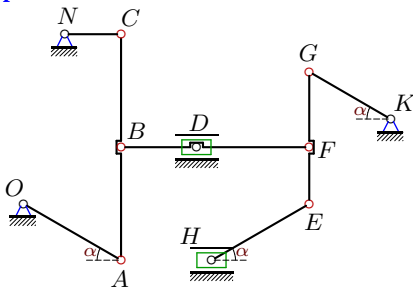
$\omega_{NC} = 18 \text{ рад/с,}$   
 $\alpha = 30^\circ,$   
 $AB = 30, BC = 30,$   
 $DB = 20, DF = 15,$   
 $NC = 15, EH = 30,$   
 $FE = 15, FG = 10,$   
 $OA = 30, KG = 25.$

**Вариант 19**



$\omega_{OA} = 19 \text{ рад/с,}$   
 $\alpha = 30^\circ,$   
 $AB = 20, BC = 10,$   
 $BF = 50, FD = 50,$   
 $NC = 15, EH = 30,$   
 $FE = 35, FG = 25,$   
 $OA = 20, KG = 25.$

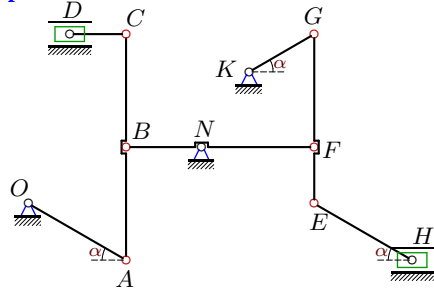
**Вариант 20**



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

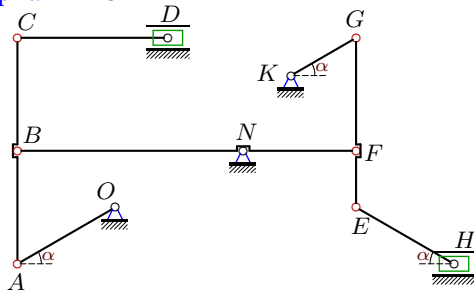


**Вариант 25**



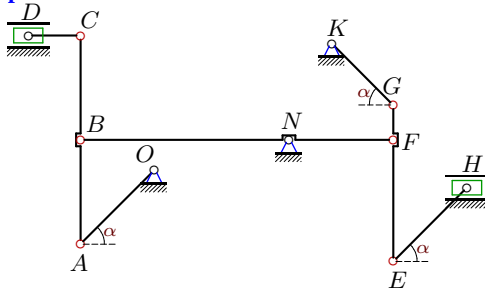
$\omega_{BF} = 25$  рад/с,  
 $\alpha = 30^\circ$ ,  
 $AB = 30, BC = 30,$   
 $NB = 20, NF = 30,$   
 $CD = 15, EH = 30,$   
 $FE = 15, FG = 30,$   
 $OA = 30, KG = 20.$

**Вариант 26**



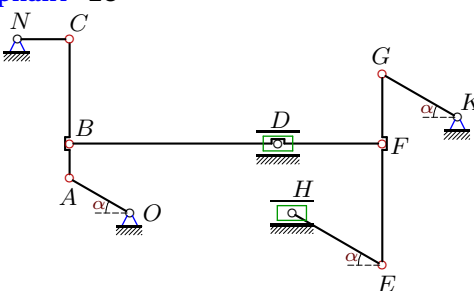
$\omega_{KG} = 26$  рад/с,  
 $\alpha = 30^\circ$ ,  
 $AB = 30, BC = 30,$   
 $NB = 60, NF = 30,$   
 $CD = 40, EH = 30,$   
 $FE = 15, FG = 30,$   
 $OA = 30, KG = 20.$

**Вариант 27**



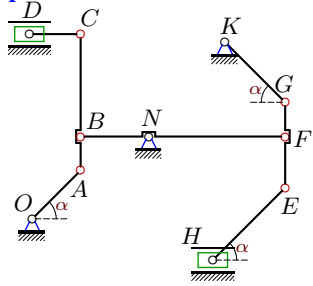
$\omega_{BF} = 27$  рад/с,  
 $\alpha = 45^\circ$ ,  
 $AB = 30, BC = 30,$   
 $NB = 60, NF = 30,$   
 $CD = 15, EH = 30,$   
 $FE = 35, FG = 10,$   
 $OA = 30, KG = 25.$

**Вариант 28**



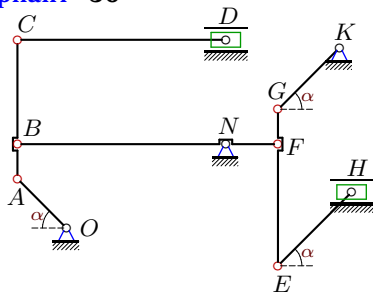
$\omega_{NC} = 28$  рад/с,  
 $\alpha = 30^\circ$ ,  
 $AB = 10, BC = 30,$   
 $DB = 60, DF = 30,$   
 $NC = 15, EH = 30,$   
 $FE = 35, FG = 20,$   
 $OA = 20, KG = 25.$

**Вариант 29**



$\omega_{KG} = 29$  рад/с,  
 $\alpha = 45^\circ$ ,  
 $AB = 10, BC = 30,$   
 $NB = 20, NF = 40,$   
 $CD = 15, EH = 30,$   
 $FE = 15, FG = 10,$   
 $OA = 20, KG = 25.$

**Вариант 30**



$\omega_{OA} = 30$  рад/с,  
 $\alpha = 45^\circ$ ,  
 $AB = 10, BC = 30,$   
 $NB = 60, NF = 15,$   
 $CD = 60, EH = 30,$   
 $FE = 35, FG = 10,$   
 $OA = 20, KG = 25.$



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	12.311	8.660	10.000	13.750
2	100.000	70.711	76.158	28.284	60.828	35.355	50.000	84.853
3	69.282	60.000	69.282	34.641	127.940	90.000	103.923	142.894
4	230.940	200.000	400.000	346.410	158.745	120.000	138.564	173.205
5	100.000	88.192	86.603	16.667	51.747	46.398	50.000	3.333
6	103.923	91.216	90.000	14.846	27.272	23.333	20.785	10.095
7	808.290	700.000	728.583	202.073	180.015	140.000	161.658	193.990
8	1000.000	866.025	888.819	200.000	240.370	173.205	200.000	66.667
9	180.000	158.745	155.885	30.000	108.167	83.516	90.000	30.000
10	200.000	176.777	141.421	106.066	778.918	135.831	120.000	689.429
11	330.000	242.683	233.345	66.670	179.700	134.378	165.000	253.346
12	600.000	519.615	1039.230	900.000	343.693	259.808	300.000	375.000
13	260.000	225.167	450.333	390.000	148.934	112.583	130.000	162.500
14	808.290	700.000	1400.000	1212.436	740.810	560.000	646.632	161.658
15	1500.000	1299.038	1500.000	750.000	461.665	324.760	375.000	140.625
16	480.000	432.666	415.692	120.000	240.000	240.000	240.000	240.000
17	510.000	447.642	441.673	72.857	88.527	114.504	102.000	56.829
18	311.769	281.025	270.000	77.942	203.435	216.982	233.827	136.399
19	380.000	335.128	329.090	63.333	196.640	176.313	190.000	202.667
20	346.410	312.250	300.000	86.603	567.891	458.258	519.615	86.603
21	420.000	296.985	332.039	148.492	288.617	148.492	210.000	98.995
22	660.000	571.577	660.000	330.000	966.518	428.683	495.000	1113.750
23	690.000	487.904	525.488	195.161	167.884	97.581	138.000	39.032
24	480.000	415.692	432.666	120.000	479.400	207.846	240.000	312.000
25	577.350	500.000	577.350	288.675	780.625	750.000	866.025	216.506
26	1040.000	900.666	1040.000	520.000	468.722	450.333	520.000	130.000
27	2291.026	1620.000	2291.026	1620.000	2948.445	810.000	1145.513	2025.000
28	484.974	457.684	420.000	181.865	742.617	277.804	242.487	833.549
29	362.500	256.326	810.575	768.979	924.197	512.652	725.000	256.326
30	600.000	424.264	1341.641	1272.792	386.086	106.066	150.000	477.297