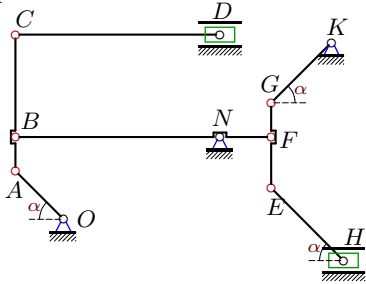


Скорости точек многосвязного механизма

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.

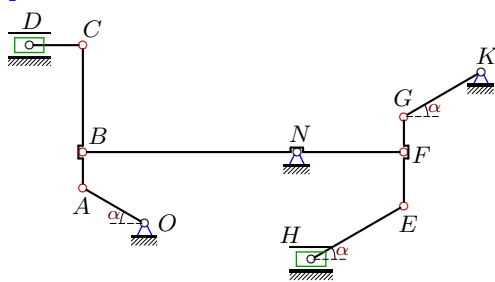
Кирсанов М.Н. Решебник. Теоретическая механика с. 158.

Вариант 1



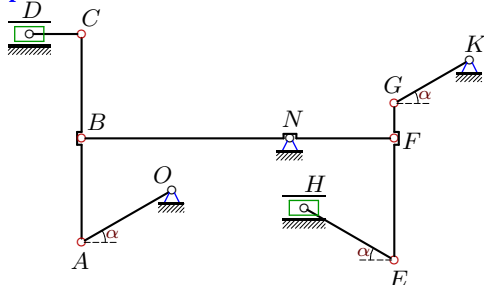
$$\begin{aligned}\omega_{OA} &= 1 \text{ рад/с}, \\ \alpha &= 45^\circ, \\ AB &= 10, BC = 30, \\ NB &= 60, NF = 15, \\ CD &= 60, EH = 30, \\ FE &= 15, FG = 10, \\ OA &= 20, KG = 25.\end{aligned}$$

Вариант 2



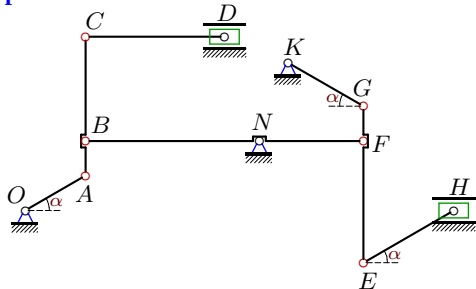
$$\begin{aligned}\omega_{OA} &= 2 \text{ рад/с}, \\ \alpha &= 30^\circ, \\ AB &= 10, BC = 30, \\ NB &= 60, NF = 30, \\ CD &= 15, EH = 30, \\ FE &= 15, FG = 10, \\ OA &= 20, KG = 25.\end{aligned}$$

Вариант 3



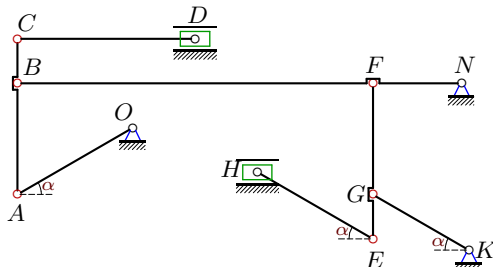
$$\begin{aligned}\omega_{BF} &= 3 \text{ рад/с}, \\ \alpha &= 30^\circ, \\ AB &= 30, BC = 30, \\ NB &= 60, NF = 30, \\ CD &= 15, EH = 30, \\ FE &= 35, FG = 10, \\ OA &= 30, KG = 25.\end{aligned}$$

Вариант 4



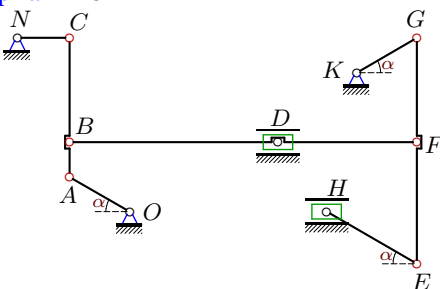
$$\begin{aligned}\omega_{KG} &= 4 \text{ рад/с}, \\ \alpha &= 30^\circ, \\ AB &= 10, BC = 30, \\ NB &= 50, NF = 30, \\ CD &= 40, EH = 30, \\ FE &= 35, FG = 10, \\ OA &= 20, KG = 25.\end{aligned}$$

Вариант 5



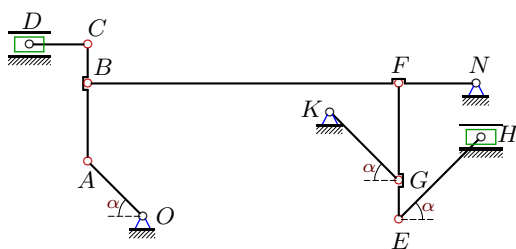
$\omega_{OA} = 5 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 25, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 40, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 30, KG = 25.$

Вариант 6



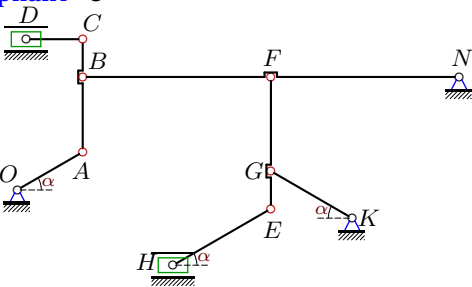
$\omega_{NC} = 6 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 10, BC = 30,$
 $DB = 60, DF = 40,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 20, KG = 20.$

Вариант 7



$\omega_{KG} = 7 \text{ рад/с},$
 $\alpha = 45^\circ,$
 $AB = 20, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 15, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

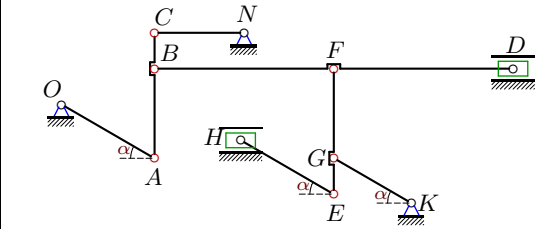
Вариант 8



$\omega_{KG} = 8 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 15, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

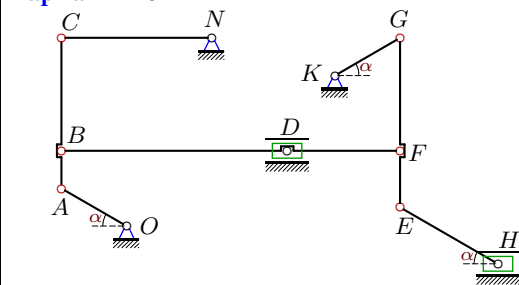
Вариант 9

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


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

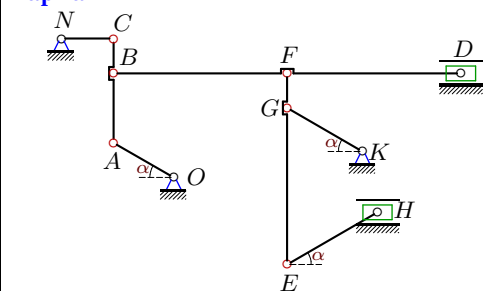
Вариант 10

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


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

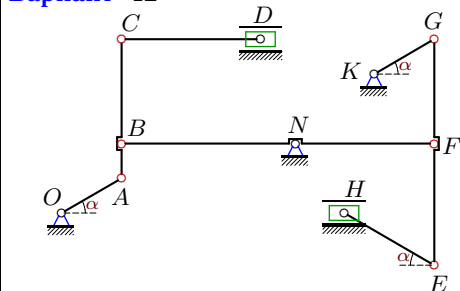
Вариант 11

$\omega_{OA} = 11 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 15, EH = 30,$
 $FE = 55, FG = 10,$
 $OA = 20, KG = 25.$


$$\begin{aligned}\omega_{OA} &= 11 \text{ рад/с}, \\ \alpha &= 30^\circ, \\ AB &= 20, BC = 10, \\ BF &= 50, FD = 50, \\ NC &= 15, EH = 30, \\ FE &= 55, FG = 10, \\ OA &= 20, KG = 25.\end{aligned}$$

Вариант 12

$\omega_{OA} = 12 \text{ рад/с}$,
 $\alpha = 30^\circ$,
 $AB = 10$, $BC = 30$,
 $NB = 50$, $NF = 40$,
 $CD = 40$, $EH = 30$,
 $FE = 35$, $FG = 30$,
 $OA = 20$, $KG = 20$.


$$\begin{aligned}\omega_{OA} &= 12 \text{ рад/с}, \\ \alpha &= 30^\circ, \\ AB &= 10, BC = 30, \\ NB &= 50, NF = 40, \\ CD &= 40, EH = 30, \\ FE &= 35, FG = 30, \\ OA &= 20, KG = 20.\end{aligned}$$

Вариант 13

$\omega_{OA} = 13 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 10, BC = 30,$
 $DB = 60, DF = 30,$
 $NC = 60, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 20, KG = 25.$

Вариант 14

$\omega_{OA} = 14 \text{ рад/с}$,
 $\alpha = 30^\circ$,
 $AB = 30$, $BC = 30$,
 $DB = 60$, $DF = 30$,
 $NC = 15$, $EH = 30$,
 $FE = 35$, $FG = 20$,
 $OA = 30$, $KG = 25$.

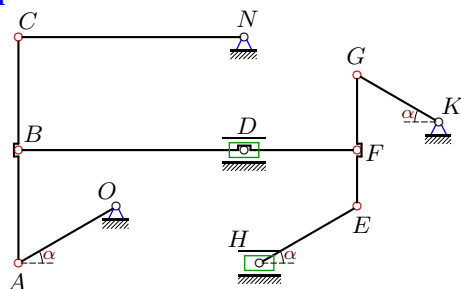
Вариант 15

$\omega_{NC} = 15 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 10, BC = 30,$
 $DB = 60, DF = 30,$
 $NC = 40, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 20, KG = 20.$

Вариант 16

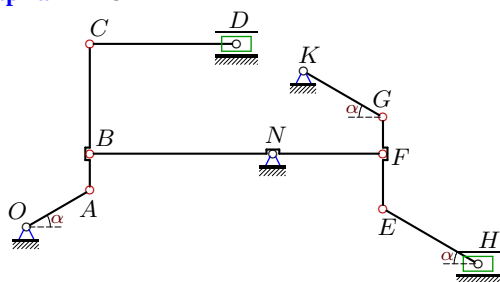
$\omega_{OA} = 16 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 15, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Вариант 17



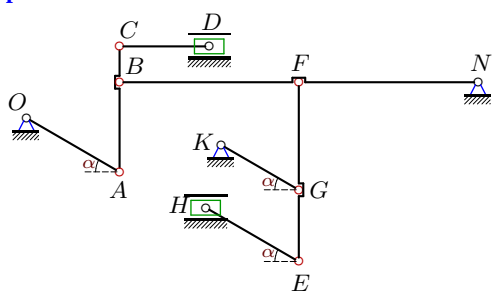
$\omega_{OA} = 17 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $DB = 60, DF = 30,$
 $NC = 60, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 30, KG = 25.$

Вариант 18



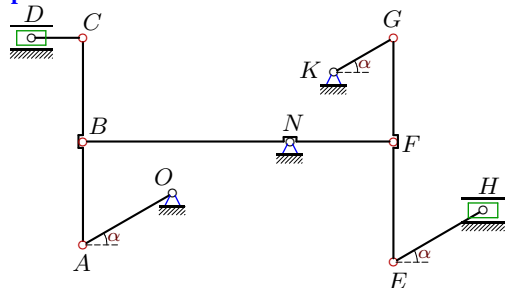
$\omega_{BF} = 18 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 10, BC = 30,$
 $NB = 50, NF = 30,$
 $CD = 40, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 20, KG = 25.$

Вариант 19



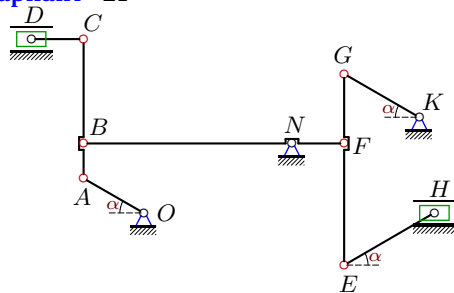
$\omega_{OA} = 19 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 25, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 25, EH = 30,$
 $FG = 30, GE = 20,$
 $OA = 30, KG = 25.$

Вариант 20



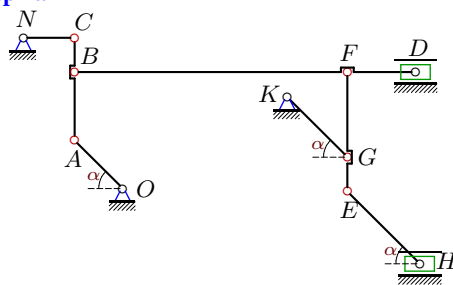
$\omega_{BF} = 20 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $NB = 60, NF = 30,$
 $CD = 15, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 30, KG = 20.$

Вариант 21



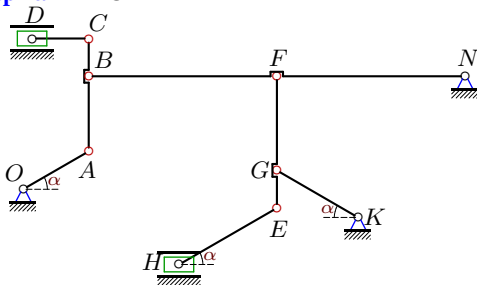
$\omega_{BF} = 21$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30$,
 $NB = 60, NF = 15$,
 $CD = 15, EH = 30$,
 $FE = 35, FG = 20$,
 $OA = 20, KG = 25$.

Вариант 22



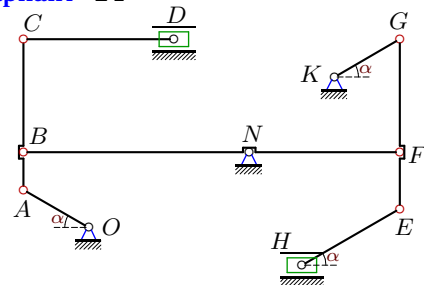
$\omega_{OA} = 22$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 20, BC = 10$,
 $BF = 80, FD = 20$,
 $NC = 15, EH = 30$,
 $FE = 35, FG = 25$,
 $OA = 20, KG = 25$.

Вариант 23



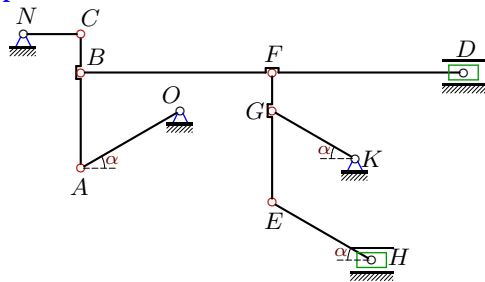
$\omega_{OA} = 23$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 20, BC = 10$,
 $BF = 50, NF = 50$,
 $CD = 15, EH = 30$,
 $FG = 25, GE = 10$,
 $OA = 20, KG = 25$.

Вариант 24



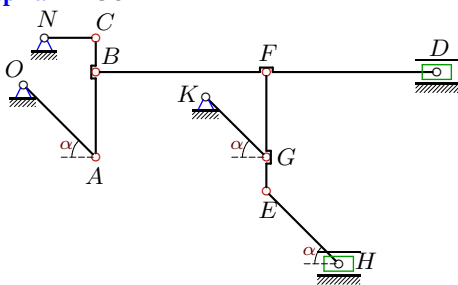
$\omega_{BF} = 24$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30$,
 $NB = 60, NF = 40$,
 $CD = 40, EH = 30$,
 $FE = 15, FG = 30$,
 $OA = 20, KG = 20$.

Вариант 29



$\omega_{OA} = 29 \text{ рад/с},$
 $\alpha = 30^\circ,$
 $AB = 25, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 15, EH = 30,$
 $FE = 34, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 30



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

Ответы

	v_A	v_B	v_C	v_D	v_E	v_F	v_G	v_H
1	20.000	14.142	44.721	42.426	6.374	3.536	5.000	1.768
2	40.000	34.641	69.282	60.000	22.913	17.321	20.000	25.000
3	207.846	180.000	207.846	103.923	202.916	90.000	103.923	129.904
4	166.667	144.338	288.675	250.000	195.256	86.603	100.000	125.000
5	150.000	129.904	133.323	30.000	33.407	25.981	30.000	6.000
6	103.923	98.075	90.000	38.971	74.418	71.545	69.282	78.664
7	875.000	618.718	691.748	309.359	212.897	123.744	175.000	296.985
8	400.000	346.410	360.555	100.000	222.711	173.205	200.000	240.000
9	259.808	228.041	225.000	37.115	135.814	118.464	129.904	11.135
10	200.000	188.746	173.205	75.000	123.111	114.564	100.000	137.500
11	220.000	194.022	190.526	36.667	167.276	102.076	110.000	192.500
12	240.000	207.846	415.692	360.000	200.479	166.277	192.000	16.000
13	260.000	245.370	225.167	97.500	246.577	148.934	130.000	154.375
14	420.000	378.583	363.731	105.000	210.000	210.000	210.000	0.000
15	692.820	653.835	600.000	259.808	469.264	396.863	346.410	187.639
16	320.000	277.128	288.444	80.000	71.267	55.426	64.000	76.800
17	510.000	459.708	441.673	127.500	255.000	255.000	255.000	255.000
18	1039.230	900.000	1800.000	1558.846	714.353	540.000	623.538	779.423
19	570.000	493.634	506.627	114.000	342.527	246.817	285.000	95.000
20	1385.641	1200.000	1385.641	692.820	723.418	600.000	692.820	750.555
21	1454.923	1260.000	2520.000	2182.384	447.791	315.000	363.731	136.399
22	440.000	327.957	311.127	103.709	77.164	120.944	88.000	16.593
23	460.000	398.372	414.638	115.000	256.117	199.186	230.000	276.000
24	1662.769	1440.000	2880.000	2494.153	999.200	960.000	1108.513	831.384
25	2886.751	2500.000	2602.082	721.688	642.910	500.000	577.350	692.820
26	750.555	658.784	650.000	107.222	1548.992	342.230	375.278	1702.152
27	540.000	476.235	467.654	90.000	279.435	250.549	270.000	18.000
28	2375.879	1680.000	5312.626	5040.000	1514.332	840.000	1187.939	2100.000
29	870.000	763.624	753.442	124.286	1104.046	396.693	435.000	820.286
30	900.000	661.862	636.396	181.827	490.092	366.485	450.000	54.548