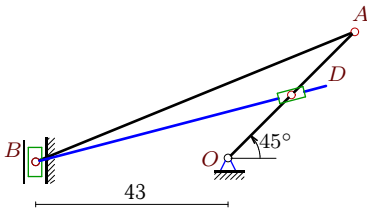


Механизм с муфтой (1)

Плоский механизм с одной степенью свободы состоит из шарнирно соединенных стержней и муфты, скользящей по направляющему стержню и шарнирно закрепленной на другом стержне или вращающейся на неподвижном шарнире. Кривошип OA вращается против часовой стрелки с постоянной угловой скоростью ω_{OA} . Горизонтальные и вертикальные размеры на рисунках даны для неподвижных шарниров и для линий движения ползунов (в см). Найти скорость муфты D (или E) относительно направляющего стержня (в см/с).

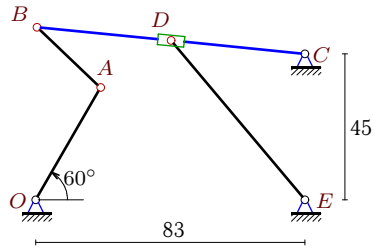
Кирсанов М.Н. **Решебник. Теоретическая механика**/Под ред. А. И. Кириллова.– М.: ФИЗМАТЛИТ, 2008. – 384 с. (с.216.)

Задача K13.1.



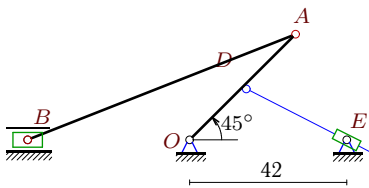
$$\omega_{OA} = 14\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 77, OD = OA/2.$$

Задача K13.2.



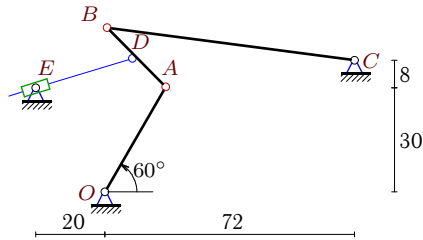
$$\omega_{OA} = 26\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 27, BC = 83, BD = BC/2.$$

Задача K13.3.



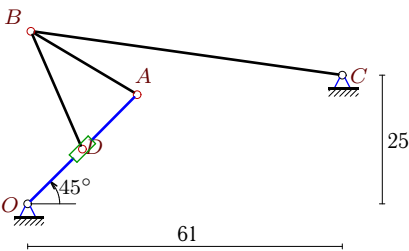
$$\omega_{OA} = 33\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 77, OD = OA/2.$$

Задача K13.4.



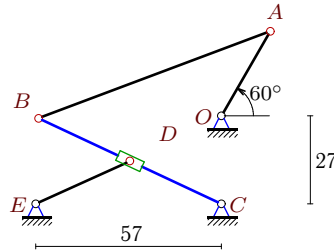
$$\omega_{OA} = 13\frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 24, BC = 72, AD = AB/2.$$

Задача K13.5.



$$\omega_{OA} = 20\frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 24, BC = 61, OD = OA/2.$$

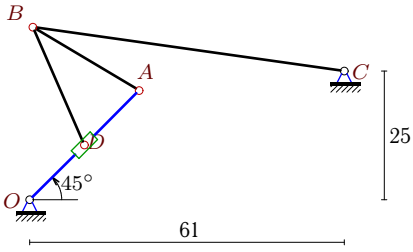
Задача K13.6.



$$\omega_{OA} = 9\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 76, BC = 62, BD = BC/2.$$

Задача K13.7.

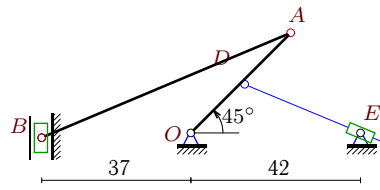
1



$$\omega_{OA} = 2\frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 24, BC = 61, OD = OA/2.$$

Задача K13.8.

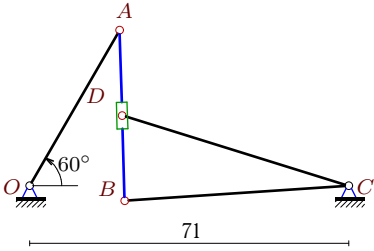
1



$$\omega_{OA} = 25\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 67, OD = OA/2.$$

Задача K13.9.

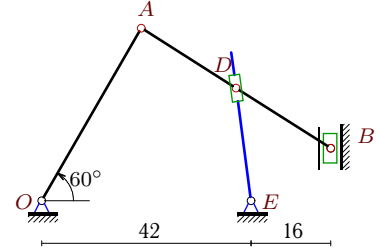
1



$$\omega_{OA} = 10\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 38, BC = 50, AD = AB/2.$$

Задача K13.10.

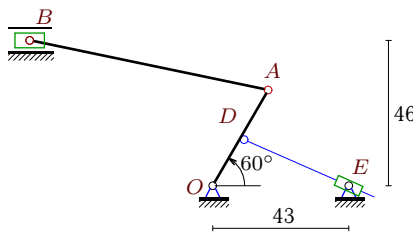
1



$$\omega_{OA} = 3\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 45, AD = AB/2.$$

Задача K13.11.

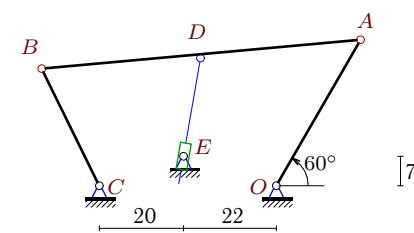
1



$$\omega_{OA} = 10\frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 77, OD = OA/2.$$

Задача K13.12.

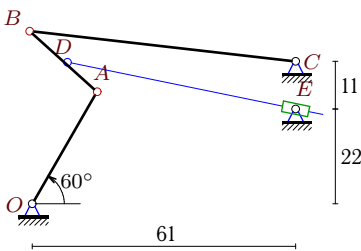
1



$$\omega_{OA} = 21\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 76, BC = 31, AD = AB/2.$$

Задача K13.13.

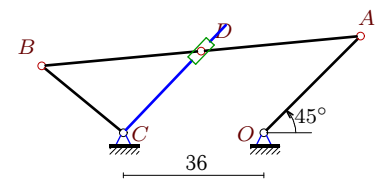
1



$$\omega_{OA} = 26\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 21, BC = 62, AD = AB/2.$$

Задача K13.14.

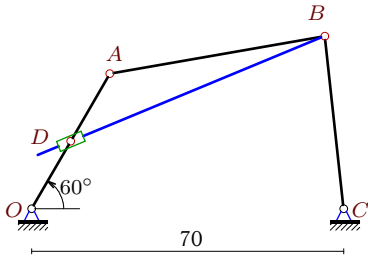
1



$$\omega_{OA} = 23\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 82, BC = 27, AD = AB/2.$$

Задача K13.15.

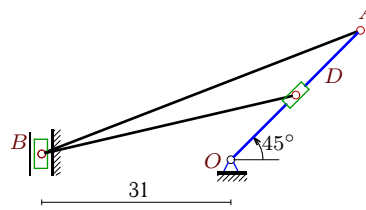
1



$$\omega_{OA} = 27\frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 49, BC = 39, OD = OA/2.$$

Задача K13.16.

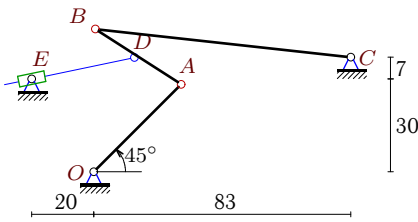
1



$$\omega_{OA} = 20\frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 56, OD = OA/2.$$

Задача K13.17.

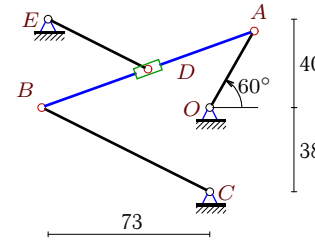
1



$$\omega_{OA} = 1\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 33, BC = 83, AD = AB/2.$$

Задача K13.18.

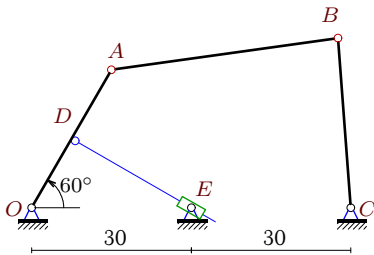
1



$$\omega_{OA} = 22\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 102, BC = 85, AD = AB/2.$$

Задача K13.19.

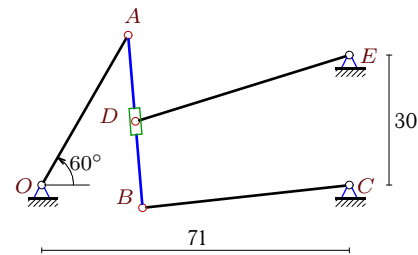
1



$$\omega_{OA} = 3\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 43, BC = 32, OD = OA/2.$$

Задача K13.20.

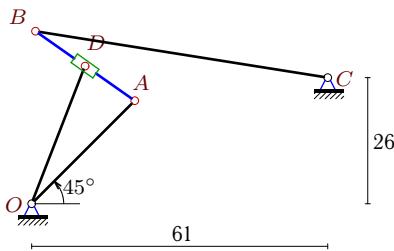
1



$$\omega_{OA} = 4\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 40, BC = 48, AD = AB/2.$$

Задача K13.21.

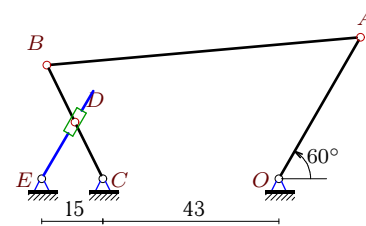
1



$$\omega_{OA} = 28\frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 25, BC = 61, AD = AB/2.$$

Задача K13.22.

1



$$\omega_{OA} = 15\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 77, BC = 31, BD = BC/2.$$

К13 Ответы.
Механизм с муфтой (1)

30.04.2012

№	v_A	v_B	v_D	v_r	x_B	y_B
1	560	573.5996	280.0000	-4.0225	-43.000	-0.828
2	1040	1650.2632	825.1316	-803.9911	0.408	53.219
3	1320	564.7536	660.0000	-627.3932	-43.333	0.000
4	455	716.0699	492.3009	7.5563	0.611	47.363
5	600	1502.3416	300.0000	-2743.1116	0.595	33.496
6	270	239.8293	119.9146	-140.4585	-56.155	-0.721
7	60	150.2342	30.0000	-274.3112	0.595	33.496
8	875	850.6063	437.5000	-404.6919	-37.000	-1.253
9	400	210.1991	272.8604	-718.3817	21.112	-3.343
10	120	223.8353	151.1311	-147.5232	58.000	10.537
11	350	339.5300	175.0000	-173.9991	-57.885	46.000
12	840	735.9220	695.4745	70.4617	-55.693	27.812
13	780	1313.4311	887.3916	-427.7528	-0.599	40.040
14	805	730.8811	516.0739	354.5863	-56.894	17.101
15	945	726.0629	472.5000	409.3573	65.764	38.769
16	600	670.0462	300.0000	-8.9700	-31.000	0.970
17	40	87.9903	58.6191	-2.7094	0.499	46.088
18	880	784.2115	571.9401	637.3534	-75.977	0.111
19	90	71.1346	45.0000	-45.0000	57.589	31.909
20	160	91.1425	113.0840	210.9758	23.285	-5.224
21	840	1884.0829	1236.3256	4526.4028	0.758	35.586
22	600	526.3437	263.1718	219.7104	-56.696	27.810
23	420	619.9951	437.3319	-141.2005	0.523	48.662
24	960	2111.7662	480.0000	-475.1728	0.499	46.088
25	280	257.1225	181.2404	136.2425	-68.099	-0.574
26	240	216.7935	120.0000	141.2880	-45.625	19.225
27	175	844.0455	87.5000	-261.6040	-58.000	45.435
28	840	921.2595	441.7186	-435.0808	-37.000	0.752
29	1155	1022.9283	577.5000	-277.6176	-50.165	23.573
30	720	1084.4084	360.0000	-765.2690	0.456	54.692

К13 файл о13к1А

№	ω_{AB}	ω_{BC}	ω_e	ε_{AB}	ε_{BC}	ε_e	a_A	a_B	a_D	a_r
1	13.602	—	13.485	-262.569	-	-339.267	78.400	185.593	39.200	-26.545
2	-57.276	-19.883	-19.883	1574.050	1355.500	1605.633	270.400	1171.935	585.968	734.891
3	13.033	—	6.558	-363.004	-	-926.090	435.600	289.042	217.800	-81.048
4	-28.569	-9.945	-16.208	413.917	351.661	486.524	59.150	263.021	155.819	-38.339
5	-51.576	-24.629	20.000	1575.980	1134.015	-8625.235	120.000	784.487	60.000	1875.879
6	4.950	3.868	3.868	-3.048	14.960	69.787	24.300	13.118	6.559	28.471
7	-5.158	-2.463	2.000	15.760	11.340	-86.252	1.200	7.845	0.600	18.759
8	23.795	—	5.177	-749.754	-	-445.640	218.750	455.509	109.375	-50.162
9	8.750	-4.204	8.750	79.038	10.567	-397.303	40.000	10.296	20.393	200.286
10	4.311	—	1.441	36.773	-	-18.266	3.600	15.337	6.175	-6.648
11	2.321	—	0.499	-41.330	-	-51.094	35.000	6.953	17.500	-1.962
12	9.843	23.739	-28.149	70.705	313.535	-237.186	176.400	199.921	182.935	-12.776
13	-58.654	-21.184	14.158	1877.895	1494.588	-1213.904	202.800	967.517	565.018	37.193
14	13.900	27.070	12.977	179.657	658.139	-38.148	185.150	265.932	201.990	125.067
15	-11.424	18.617	-2.779	152.902	562.746	-21.695	255.150	257.757	127.575	142.567
16	20.958	—	20.000	-713.816	-	-1009.889	120.000	376.773	60.000	67.126
17	-2.130	-1.060	-1.667	1.080	1.562	2.734	0.400	1.597	0.874	-1.051
18	11.888	9.226	11.888	-21.188	86.985	103.870	193.600	103.448	137.039	112.463
19	-1.182	2.223	-0.000	1.600	6.767	-5.196	2.700	2.681	1.350	-0.000
20	3.227	-1.899	3.227	13.513	2.380	-291.860	6.400	2.074	3.315	154.423
21	-61.926	-30.887	-61.926	1286.398	1475.992	18650.787	235.200	1072.045	588.787	-4800.979
22	6.944	16.979	8.988	36.122	161.950	99.313	90.000	102.503	51.252	32.533
23	-23.885	-8.611	-6.571	220.017	250.807	211.536	50.400	188.308	114.710	-25.095
24	-51.115	-25.443	2.881	621.903	899.455	-599.952	230.400	919.793	115.200	-18.253
25	4.363	3.428	-2.632	-2.308	11.528	-49.666	22.400	12.347	15.843	-6.949
26	3.942	9.426	8.000	13.811	54.416	-49.782	19.200	23.963	9.600	35.461
27	-10.020	—	-10.370	472.310	-	539.420	8.750	379.358	4.375	78.318
28	24.610	—	-7.113	-775.688	-	1843.379	201.600	427.189	135.984	1.380
29	15.906	37.886	14.034	198.354	827.170	317.287	381.150	447.295	190.575	11.080
30	-36.761	-13.065	-16.448	540.199	574.171	620.254	129.600	497.176	64.800	345.391