

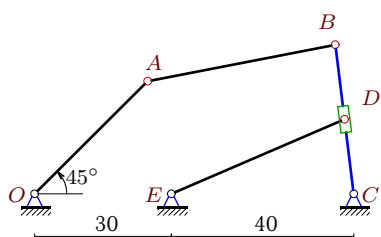
Механизм с муфтой (1)

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.

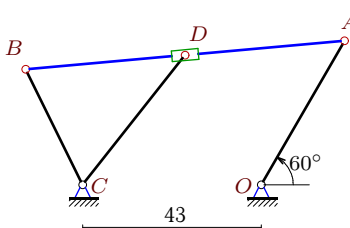
5



$$\omega_{OA} = 20 \frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 42, BC = 33, BD = BC/2.$$

Задача K13.2.

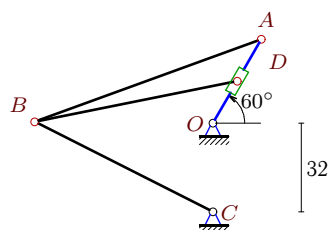
5



$$\omega_{OA} = 6 \frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 77, BC = 31, AD = AB/2.$$

Задача K13.3.

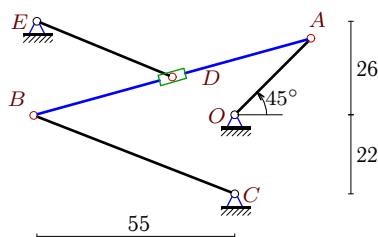
5



$$\omega_{OA} = 29 \frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 87, BC = 72, OD = OA/2.$$

Задача K13.4.

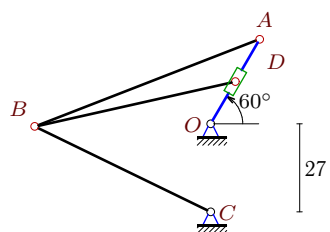
5



$$\omega_{OA} = 4 \frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 80, BC = 60, AD = AB/2.$$

Задача K13.5.

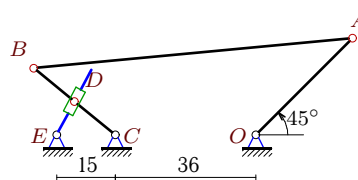
5



$$\omega_{OA} = 10 \frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 74, BC = 60, OD = OA/2.$$

Задача K13.6.

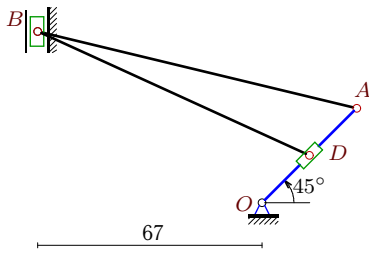
5



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

Задача K13.7.

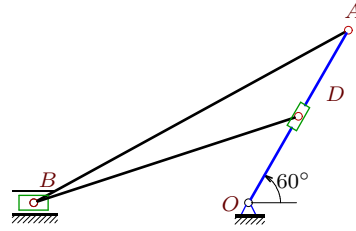
5



$$\omega_{OA} = 29\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 98, OD = OA/2.$$

Задача K13.8.

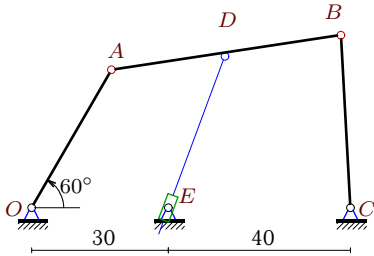
5



$$\omega_{OA} = 9\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 72, OD = OA/2.$$

Задача K13.9.

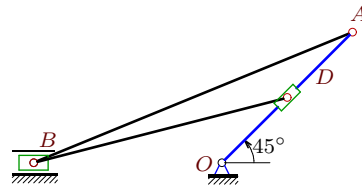
5



$$\omega_{OA} = 22\frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 51, BC = 38, AD = AB/2.$$

Задача K13.10.

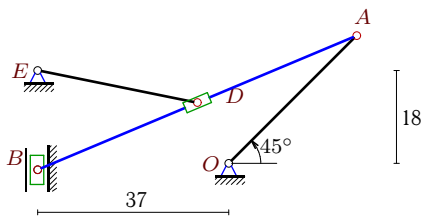
5



$$\omega_{OA} = 23\frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 56, OD = OA/2.$$

Задача K13.11.

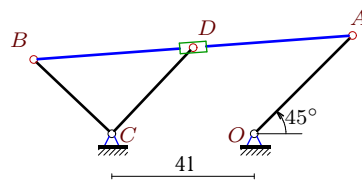
5



$$\omega_{OA} = 20\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 67, AD = AB/2.$$

Задача K13.12.

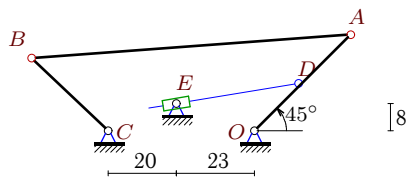
5



$$\omega_{OA} = 33\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 92, BC = 31, AD = AB/2.$$

Задача K13.13.

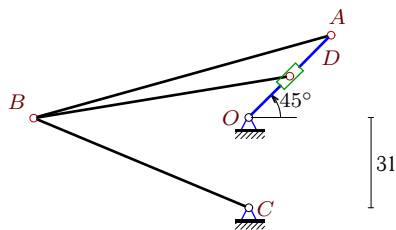
5



$$\omega_{OA} = 25\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 94, BC = 31, OD = OA/2.$$

Задача K13.14.

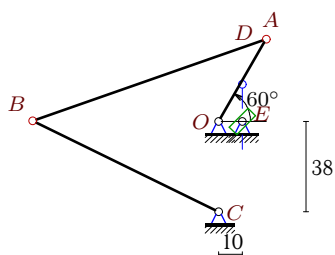
5



$$\omega_{OA} = 3\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 106, BC = 80, OD = OA/2.$$

Задача K13.15.

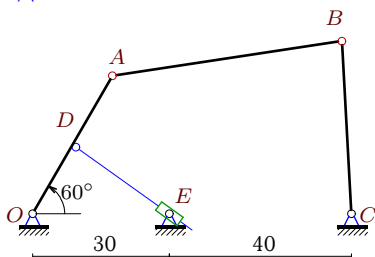
5



$$\omega_{OA} = 14\frac{1}{2}, \alpha = 60^\circ, OA = 40, \\ AB = 104, BC = 87, OD = OA/2.$$

Задача K13.17.

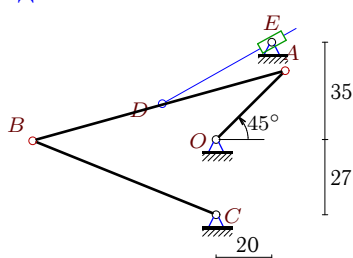
5



$$\omega_{OA} = 6\frac{1}{2}, \alpha = 60^\circ, OA = 35, \\ AB = 51, BC = 38, OD = OA/2.$$

Задача K13.19.

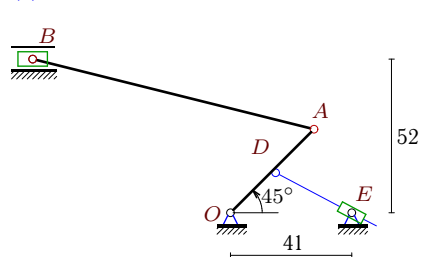
5



$$\omega_{OA} = 26\frac{1}{2}, \alpha = 45^\circ, OA = 35, \\ AB = 94, BC = 71, AD = AB/2.$$

Задача K13.21.

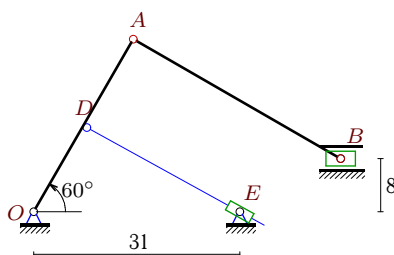
5



$$\omega_{OA} = 14\frac{1}{2}, \alpha = 45^\circ, OA = 40, \\ AB = 98, OD = OA/2.$$

Задача K13.16.

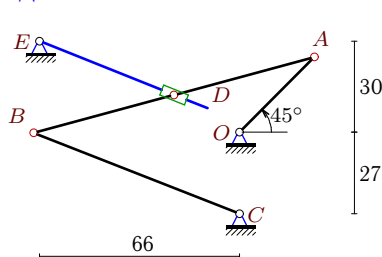
5



$$\omega_{OA} = 20\frac{1}{2}, \alpha = 60^\circ, OA = 30, \\ AB = 36, OD = OA/2.$$

Задача K13.18.

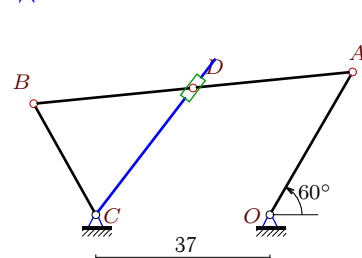
5



$$\omega_{OA} = 13\frac{1}{2}, \alpha = 45^\circ, OA = 35, \\ AB = 96, BC = 73, AD = AB/2.$$

Задача K13.20.

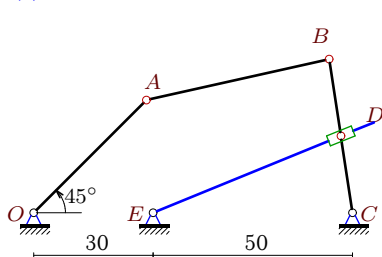
5



$$\omega_{OA} = 9\frac{1}{2}, \alpha = 60^\circ, OA = 35, \\ AB = 68, BC = 27, AD = AB/2.$$

Задача K13.22.

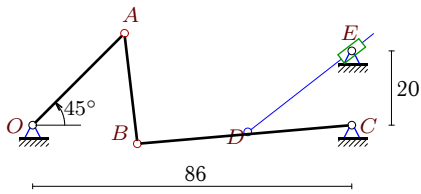
5



$$\omega_{OA} = 13\frac{1}{2}, \alpha = 45^\circ, OA = 40, \\ AB = 47, BC = 39, BD = BC/2.$$

Задача K13.23.

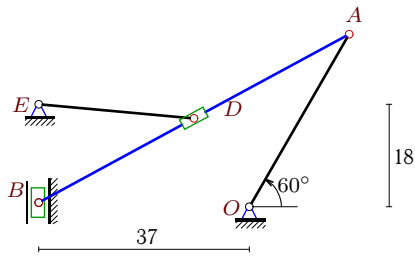
5



$$\omega_{OA} = 8\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 30, BC = 58, BD = BC/2.$$

Задача K13.24.

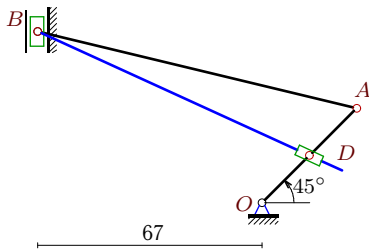
5



$$\omega_{OA} = 18\frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 62, AD = AB/2.$$

Задача K13.25.

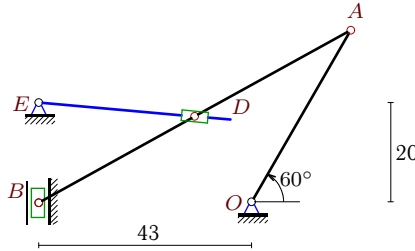
5



$$\omega_{OA} = 30\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 98, OD = OA/2.$$

Задача K13.26.

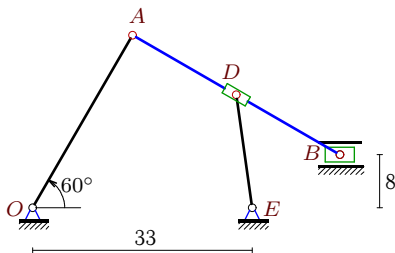
5



$$\omega_{OA} = 2\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 72, AD = AB/2.$$

Задача K13.27.

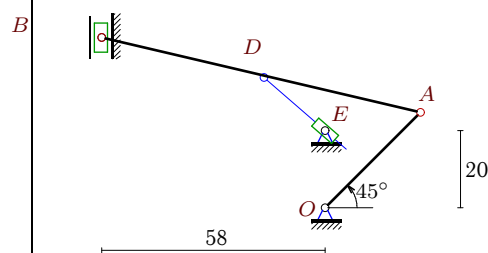
5



$$\omega_{OA} = 33\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 36, AD = AB/2.$$

Задача K13.28.

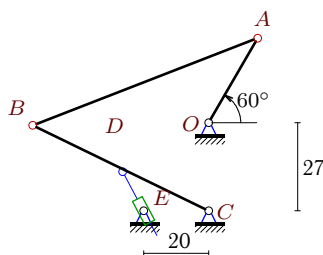
5



$$\omega_{OA} = 18\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 85, AD = AB/2.$$

Задача K13.29.

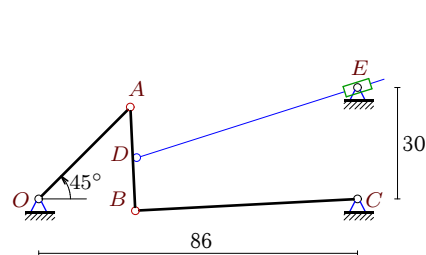
5



$$\omega_{OA} = 28\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 74, BC = 60, BD = BC/2.$$

Задача K13.30.

5



$$\omega_{OA} = 7\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 28, BC = 60, AD = AB/2.$$

K13 Ответы.
Механизм с муфтой (1)

07.04.2012

№	v_A	v_B	v_D	v_r	x_B	y_B
1	700	392.5074	196.2537	670.2050	65.979	32.754
2	240	210.5375	198.8182	163.5405	-56.696	27.810
3	1015	893.4077	507.5000	259.3684	-64.239	0.517
4	120	98.5749	60.4733	69.0231	-55.881	-0.152
5	300	256.4566	150.0000	72.9647	-53.981	-0.808
6	35	31.7774	15.8887	15.5826	-56.894	17.101
7	1160	4231.5662	580.0000	3474.4273	-67.000	51.195
8	360	212.9813	180.0000	110.4866	-43.119	0.000
9	770	604.4726	659.1377	56.8079	67.926	37.943
10	690	288.1994	345.0000	120.3752	-30.613	0.000
11	700	680.4850	264.2982	271.2869	-37.000	-1.253
12	1320	1160.0321	867.8054	758.8872	-63.456	21.372
13	1000	881.8157	500.0000	291.1329	-65.461	21.366
14	120	95.2545	60.0000	18.8377	-73.823	-0.176
15	560	512.7818	280.0000	-140.0000	-78.146	0.240
16	600	692.5736	300.0000	-299.9480	46.188	8.000
17	210	164.8562	105.0000	-104.5172	67.926	37.943
18	455	380.4398	231.0690	208.0201	-67.932	-0.276
19	910	735.4084	459.9251	-409.8364	-65.826	-0.394
20	315	278.9805	258.4060	148.6272	-50.165	23.573
21	560	494.7413	280.0000	-267.4335	-66.803	52.000
22	520	279.1038	139.5519	135.6154	74.148	38.558
23	280	219.6617	109.8309	59.7347	28.220	-5.050
24	630	690.9447	331.2889	306.0019	-37.000	0.752
25	1200	4377.4823	600.0000	-1256.1723	-67.000	51.195
26	80	85.2198	41.3667	32.5132	-43.000	-0.216
27	990	1142.7465	1030.2271	-625.4429	46.188	8.000
28	630	2342.3763	1411.6106	-1083.0001	-58.000	44.182
29	840	718.0786	359.0393	211.1602	-53.981	-0.808
30	245	181.3230	199.3794	-33.5861	26.086	-3.219

K13 файл o13k5A

№	ω_{AB}	ω_{BC}	ω_e	ε_{AB}	ε_{BC}	ε_e	a_A	a_B	a_D	a_r
1	-13.165	11.894	11.894	106.382	563.782	1198.354	140.000	191.816	95.908	465.983
2	2.777	6.792	2.777	5.779	25.912	-16.653	14.400	16.401	14.980	9.771
3	15.961	12.408	29.000	-38.517	151.726	-214.260	294.350	155.639	147.175	138.568
4	2.291	1.643	2.291	0.381	3.537	1.887	4.800	2.670	3.263	2.497
5	5.519	4.274	10.000	-4.110	18.896	-23.561	30.000	15.770	15.000	13.084
6	0.604	1.177	0.320	0.340	1.244	-0.524	0.350	0.503	0.251	0.191
7	-35.802	—	29.000	4292.439	-	-12030.701	336.400	4621.549	168.200	15020.952
8	2.852	—	9.000	-39.991	-	-99.793	32.400	24.920	16.200	33.530
9	-8.289	15.907	-18.032	96.624	347.816	-208.485	169.400	163.446	163.681	35.594
10	9.414	—	23.000	-180.250	-	-361.545	158.700	104.523	79.350	78.264
11	19.036	—	19.036	-479.842	-	811.375	140.000	291.526	108.245	152.187
12	19.334	37.420	19.334	313.935	1206.454	-517.453	435.600	572.983	456.737	272.416
13	14.358	28.446	-10.798	182.237	714.433	26.328	250.000	334.620	125.000	57.732
14	1.692	1.191	3.000	0.182	2.004	-0.544	3.600	1.964	1.800	0.815
15	7.546	5.894	-14.000	-8.098	34.648	113.161	78.400	42.686	39.200	0.000
16	-9.619	—	0.208	279.870	-	-228.061	120.000	38.534	60.000	-1.129
17	-2.261	4.338	-0.385	7.187	25.871	-20.940	12.600	12.157	6.300	0.565
18	7.291	5.212	-2.103	4.292	37.156	-103.367	59.150	33.598	40.723	-0.456
19	14.632	10.358	4.487	15.678	150.591	-283.208	236.600	131.279	162.565	-141.299
20	4.338	10.333	6.225	14.754	61.525	19.761	28.350	33.270	29.820	14.228
21	4.164	—	2.733	-62.627	-	-171.498	78.400	24.095	39.200	-13.878
22	-8.930	7.157	0.647	48.467	239.518	6.025	67.600	95.524	47.762	47.531
23	6.002	-3.787	2.516	85.997	4.918	-1.238	22.400	8.795	4.397	0.396
24	18.458	—	18.458	-436.324	-	827.892	113.400	240.294	76.491	116.031
25	-37.036	—	-42.289	4593.573	-	6045.504	360.000	4945.772	180.000	522.048
26	1.988	—	-0.809	-4.845	-	0.837	1.600	3.044	0.921	0.265
27	-15.871	—	-15.871	761.947	-	2741.271	326.700	104.910	194.944	248.128
28	-22.924	—	41.084	1824.985	-	-7191.636	113.400	1692.457	887.228	179.547
29	15.454	11.968	-19.561	-32.221	148.141	-628.355	235.200	123.637	61.818	4.090
30	5.846	-3.022	3.092	64.942	3.326	-12.074	17.150	5.832	7.649	-11.289