

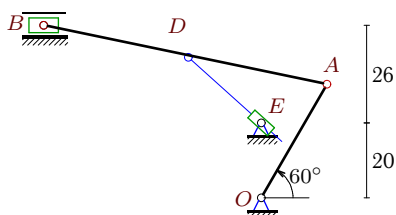
Механизм с муфтой (1)

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.

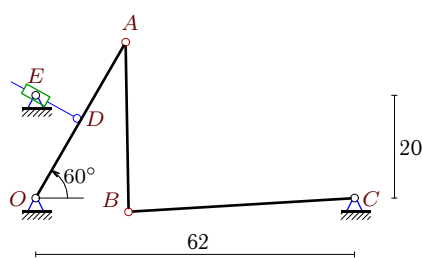
9



$$\omega_{OA} = 12\frac{1}{6}, \alpha = 60^\circ, OA = 35, \\ AB = 77, AD = AB/2.$$

Задача K13.2.

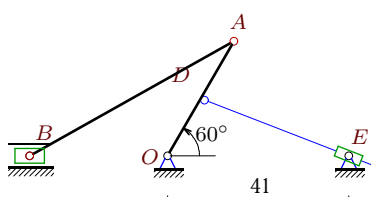
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$$\omega_{OA} = 4\frac{1}{6}, \alpha = 60^\circ, OA = 35, \\ AB = 33, BC = 44, OD = OA/2.$$

Задача K13.3.

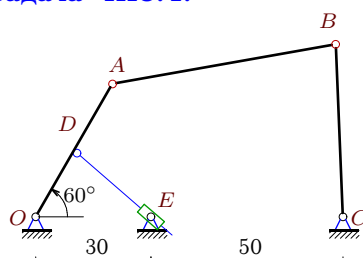
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$$\omega_{OA} = 2\frac{1}{6}, \alpha = 60^\circ, OA = 30, \\ AB = 53, OD = OA/2.$$

Задача K13.4.

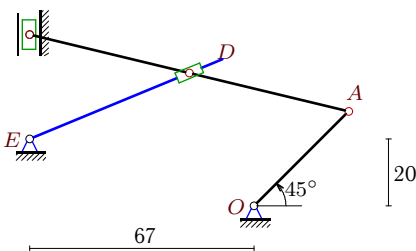
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$$\omega_{OA} = 24\frac{1}{6}, \alpha = 60^\circ, OA = 40, \\ AB = 59, BC = 45, OD = OA/2.$$

Задача K13.5.

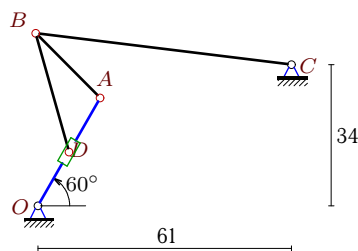
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$$\omega_{OA} = 11\frac{1}{6}, \alpha = 45^\circ, OA = 40, \\ AB = 98, AD = AB/2.$$

Задача K13.6.

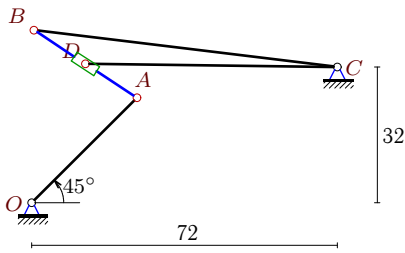
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$$\omega_{OA} = 22\frac{1}{6}, \alpha = 60^\circ, OA = 30, \\ AB = 22, BC = 62, OD = OA/2.$$

Задача K13.7.

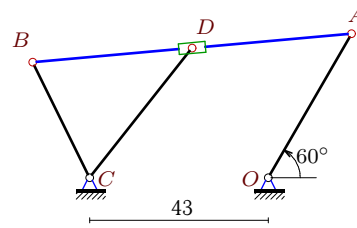
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$$\omega_{OA} = 2\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 29, BC = 72, AD = AB/2.$$

Задача K13.8.

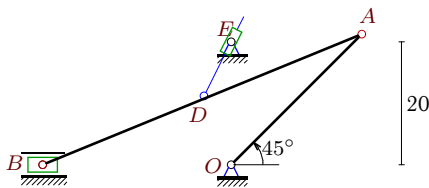
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$$\omega_{OA} = 31\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 77, BC = 31, AD = AB/2.$$

Задача K13.9.

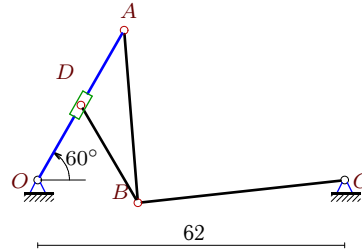
9



$$\omega_{OA} = 9\frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 56, AD = AB/2.$$

Задача K13.10.

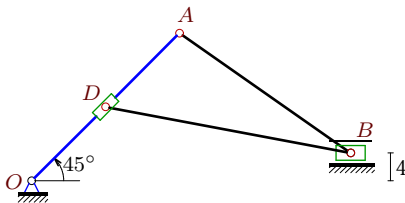
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$$\omega_{OA} = 20\frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 35, BC = 42, OD = OA/2.$$

Задача K13.11.

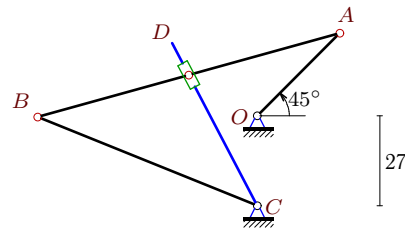
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$$\omega_{OA} = 4\frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 30, OD = OA/2.$$

Задача K13.12.

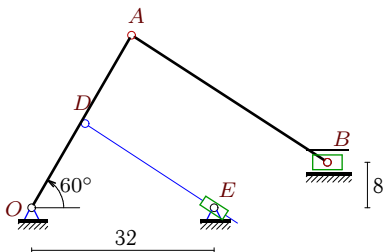
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$$\omega_{OA} = 16\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 94, BC = 71, AD = AB/2.$$

Задача K13.13.

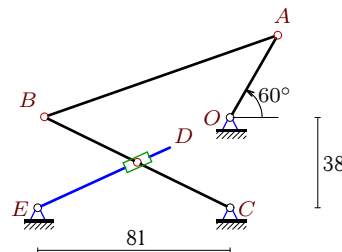
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$$\omega_{OA} = 18\frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 41, OD = OA/2.$$

Задача K13.14.

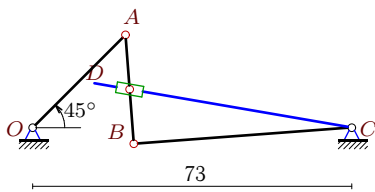
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$$\omega_{OA} = 33\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 104, BC = 87, BD = BC/2.$$

Задача K13.15.

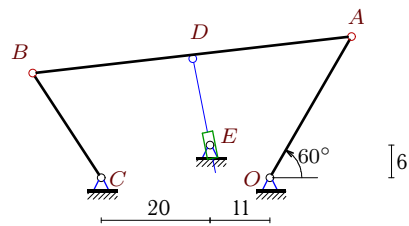
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$$\omega_{OA} = 13\frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 25, BC = 50, AD = AB/2.$$

Задача K13.16.

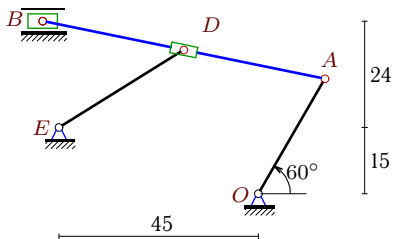
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$$\omega_{OA} = 28\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 59, BC = 23, AD = AB/2.$$

Задача K13.17.

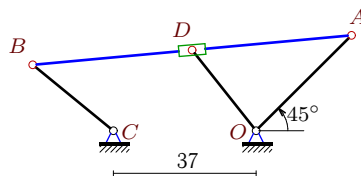
9



$$\omega_{OA} = 27\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 65, AD = AB/2.$$

Задача K13.18.

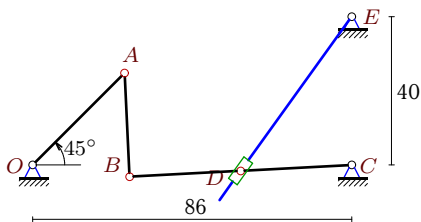
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$$\omega_{OA} = 24\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 83, BC = 27, AD = AB/2.$$

Задача K13.19.

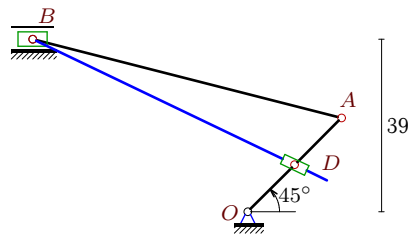
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$$\omega_{OA} = 26\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 28, BC = 60, BD = BC/2.$$

Задача K13.20.

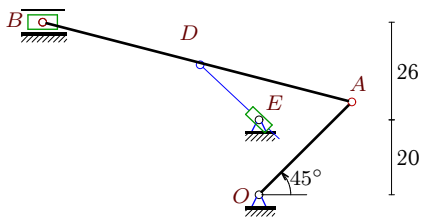
9



$$\omega_{OA} = 7\frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 72, OD = OA/2.$$

Задача K13.21.

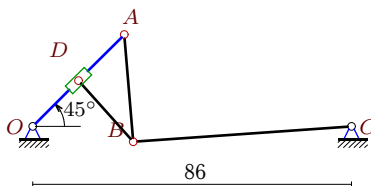
9



$$\omega_{OA} = 3\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 85, AD = AB/2.$$

Задача K13.22.

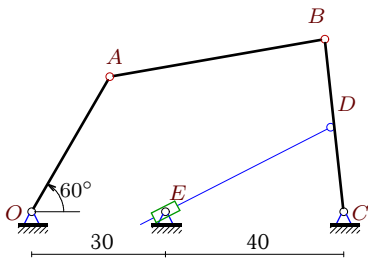
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$$\omega_{OA} = 27\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 29, BC = 59, OD = OA/2.$$

Задача K13.23.

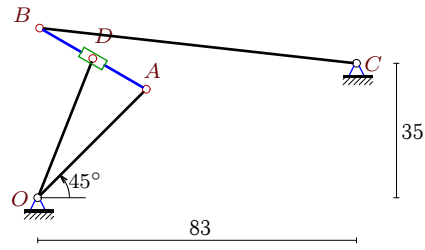
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$$\omega_{OA} = 2\frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 49, BC = 39, BD = BC/2.$$

Задача K13.24.

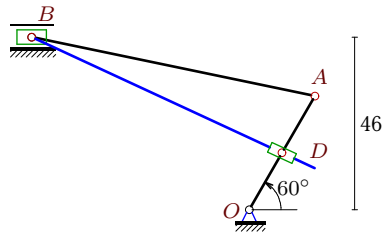
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$$\omega_{OA} = 8\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 32, BC = 83, AD = AB/2.$$

Задача K13.25.

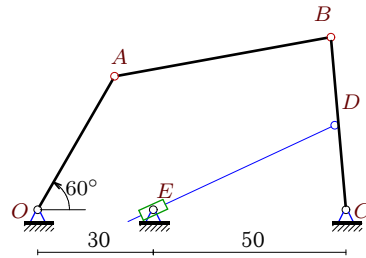
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$$\omega_{OA} = 25\frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 77, OD = OA/2.$$

Задача K13.26.

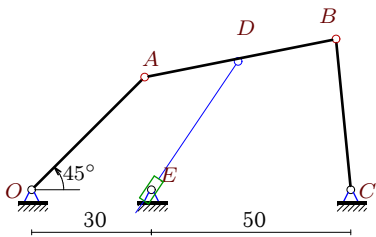
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$$\omega_{OA} = 13\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 57, BC = 45, BD = BC/2.$$

Задача K13.27.

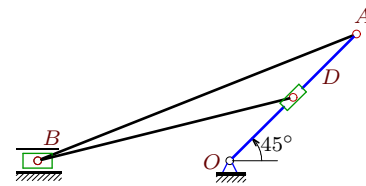
9



$$\omega_{OA} = 10\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 49, BC = 38, AD = AB/2.$$

Задача K13.28.

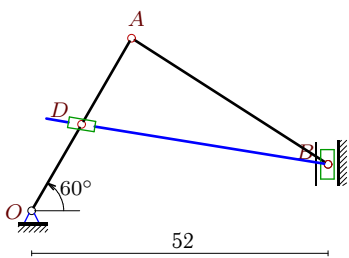
9



$$\omega_{OA} = 13\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 67, OD = OA/2.$$

Задача K13.29.

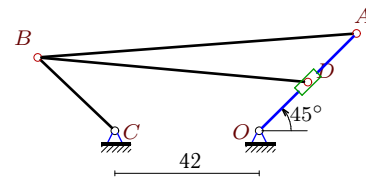
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$$\omega_{OA} = 33\frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 41, OD = OA/2.$$

Задача K13.30.

9



$$\omega_{OA} = 7\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 93, BC = 31, OD = OA/2.$$

K13 Ответы.
Механизм с муфтой (1)

07.04.2012

№	v_A	v_B	v_D	v_r	x_B	y_B
1	420	407.4360	399.6242	-356.9301	-57.885	46.000
2	140	72.1952	70.0000	69.9887	18.082	-2.684
3	60	35.0892	30.0000	-29.6464	-31.195	0.000
4	960	741.2049	480.0000	-471.3506	78.091	44.959
5	440	1605.0768	970.6489	-223.0240	-67.000	51.195
6	660	1033.5855	330.0000	-1027.1472	-0.538	41.556
7	70	154.0687	102.3908	19.8076	0.527	40.696
8	1240	1087.7770	1027.2275	844.9593	-56.696	27.810
9	270	112.7737	179.3594	17.4219	-30.613	0.000
10	700	396.7446	350.0000	-118.2732	20.251	-4.581
11	120	144.2978	60.0000	163.5077	45.784	4.000
12	560	452.5590	283.0308	-120.8490	-65.826	-0.394
13	630	749.9080	315.0000	-314.5396	51.898	8.000
14	1320	1208.6999	604.3499	466.9243	-78.146	0.240
15	390	296.1866	322.0501	-195.1764	23.138	-3.713
16	840	755.1075	679.4570	-135.5721	-43.613	19.233
17	810	784.2783	769.9845	721.4798	-48.683	39.000
18	840	764.6494	539.0729	614.5647	-57.898	17.096
19	910	673.4855	336.7428	262.3347	26.086	-3.219
20	210	186.3492	105.0000	-68.9415	-48.555	39.000
21	105	93.4177	91.6838	-86.5506	-57.552	46.000
22	945	721.2272	472.5000	-1759.2139	27.146	-4.152
23	70	53.7824	26.8912	25.1279	65.764	38.769
24	320	776.5920	503.9685	3106.2990	0.509	44.175
25	875	848.8250	437.5000	-334.5756	-57.885	46.000
26	520	398.3132	199.1566	187.1250	76.082	44.829
27	400	223.4732	284.4365	33.0555	76.347	37.824
28	455	193.8457	227.5000	82.5849	-37.513	0.000
29	1155	2135.2636	577.5000	-198.7965	52.000	8.158
30	280	246.4919	140.0000	70.6997	-64.458	21.369

K13 файл o13k9A

N_2	ω_{AB}	ω_{BC}	ω_e	ε_{AB}	ε_{BC}	ε_e	a_A	a_B	a_D	a_r
1	2.786	—	-6.619	-59.515	-	70.882	50.400	10.013	28.040	-10.396
2	3.541	-1.641	-0.126	12.423	1.622	26.233	5.600	1.383	2.800	0.049
3	0.649	—	0.128	-2.012	-	-1.861	1.200	0.928	0.600	-0.098
4	-8.804	16.471	-3.429	134.174	398.702	-305.407	230.400	217.014	115.200	18.661
5	-13.580	—	18.319	617.580	-	-771.992	48.400	664.932	349.996	-23.432
6	-44.786	-16.671	22.000	872.558	898.185	-3983.962	145.200	582.923	72.600	1216.382
7	-4.271	-2.140	-4.271	4.469	6.412	8.910	1.400	5.673	3.108	1.650
8	14.350	35.090	14.350	154.279	691.707	-444.554	384.400	437.804	399.880	260.830
9	3.684	—	16.995	-27.600	-	161.057	24.300	16.004	18.686	-45.447
10	16.134	-9.446	20.000	335.857	60.521	996.901	140.000	45.285	70.000	137.722
11	-3.453	—	4.000	5.459	-	77.265	4.800	5.385	2.400	23.361
12	9.004	6.374	5.786	5.937	57.029	78.856	89.600	49.715	61.563	22.637
13	-9.158	—	-0.613	231.110	-	-190.096	113.400	33.983	56.700	2.960
14	17.787	13.893	-8.326	-44.995	192.508	-424.889	435.600	237.170	118.585	-20.556
15	10.181	-5.924	-4.967	224.120	14.041	80.228	50.700	18.898	22.607	-17.986
16	14.230	32.831	-39.320	167.704	642.316	41.304	235.200	288.588	251.565	-30.787
17	6.360	—	6.360	-305.680	-	-63.879	218.700	43.796	121.785	69.581
18	14.348	28.320	14.348	197.259	730.737	216.800	201.600	292.953	221.882	22.945
19	21.715	-11.225	-4.118	895.932	45.882	32.126	236.600	80.454	40.227	4.282
20	2.128	—	1.759	-16.053	-	-11.376	14.700	4.379	7.350	-3.542
21	0.902	—	-1.345	-2.917	-	1.931	3.150	0.938	1.935	-0.800
22	21.365	-12.224	27.000	974.091	53.265	143418.012	255.150	93.598	127.575	31608.512
23	-0.846	1.379	-0.225	0.839	3.088	0.045	1.400	1.414	0.707	0.673
24	-19.642	-9.357	-19.642	193.545	151.693	-13680.966	25.600	145.368	78.259	5513.999
25	5.804	—	5.392	-258.312	-	-172.629	218.750	43.458	109.375	-50.947
26	-5.254	8.851	-1.286	38.015	125.424	3.943	67.600	66.547	33.274	31.673
27	-6.332	5.881	-7.084	29.219	136.435	-60.926	40.000	53.485	45.635	21.193
28	5.167	—	13.000	-56.563	-	-114.272	59.150	39.198	29.575	30.311
29	45.153	—	43.428	4035.346	-	3423.223	381.150	1513.752	190.575	-652.239
30	4.060	7.951	7.000	14.209	55.155	9.972	19.600	26.009	9.800	4.985