

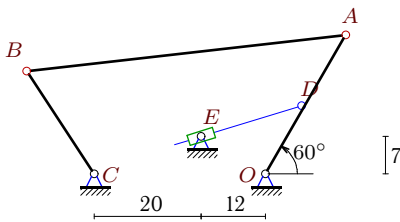
Механизм с муфтой (1)

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.

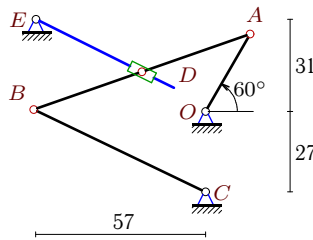
3



$$\omega_{OA} = 13\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 60, BC = 23, OD = OA/2.$$

Задача K13.2.

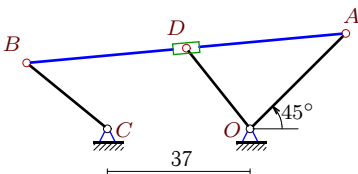
3



$$\omega_{OA} = 33\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 77, BC = 64, AD = AB/2.$$

Задача K13.3.

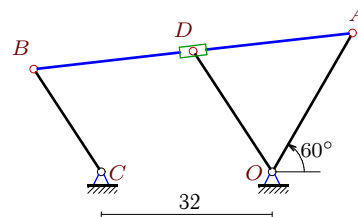
3



$$\omega_{OA} = 4\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 83, BC = 27, AD = AB/2.$$

Задача K13.4.

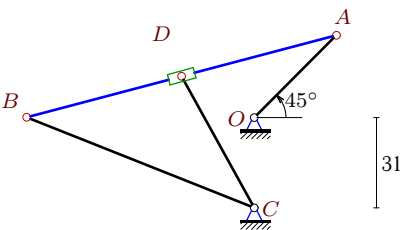
3



$$\omega_{OA} = 4\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 60, BC = 23, AD = AB/2.$$

Задача K13.5.

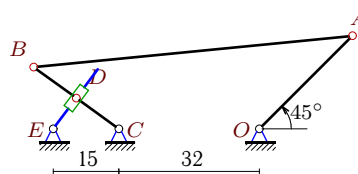
3



$$\omega_{OA} = 3\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 110, BC = 84, AD = AB/2.$$

Задача K13.6.

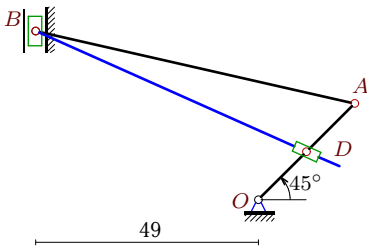
3



$$\omega_{OA} = 26\frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 73, BC = 24, BD = BC/2.$$

Задача K13.7.

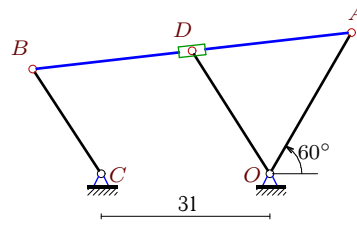
3



$$\omega_{OA} = 25\frac{1}{c}, \alpha = 45^\circ, OA = 30, AB = 72, OD = OA/2.$$

Задача K13.8.

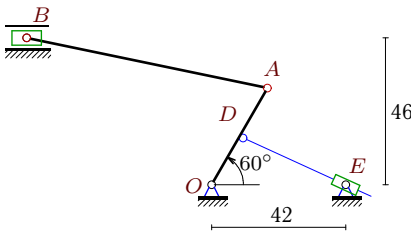
3



$$\omega_{OA} = 25\frac{1}{c}, \alpha = 60^\circ, OA = 30, AB = 59, BC = 23, AD = AB/2.$$

Задача K13.9.

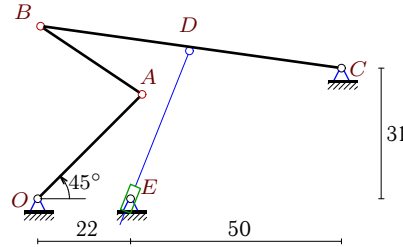
3



$$\omega_{OA} = 33\frac{1}{c}, \alpha = 60^\circ, OA = 35, AB = 77, OD = OA/2.$$

Задача K13.10.

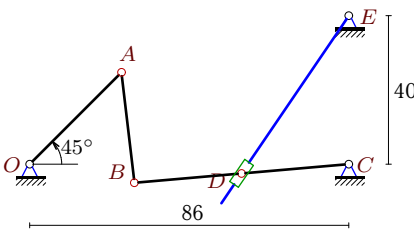
3



$$\omega_{OA} = 22\frac{1}{c}, \alpha = 45^\circ, OA = 35, AB = 29, BC = 72, BD = BC/2.$$

Задача K13.11.

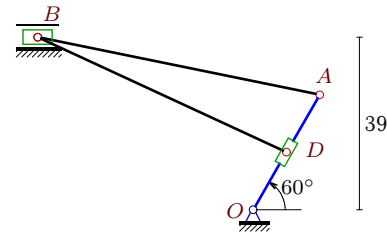
3



$$\omega_{OA} = 4\frac{1}{c}, \alpha = 45^\circ, OA = 35, AB = 30, BC = 58, BD = BC/2.$$

Задача K13.12.

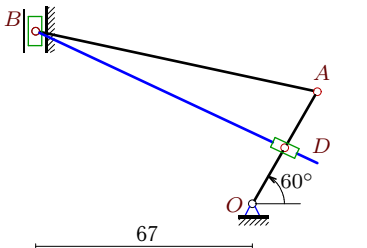
3



$$\omega_{OA} = 26\frac{1}{c}, \alpha = 60^\circ, OA = 30, AB = 65, OD = OA/2.$$

Задача K13.13.

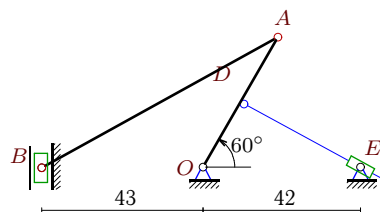
3



$$\omega_{OA} = 27\frac{1}{c}, \alpha = 60^\circ, OA = 40, AB = 89, OD = OA/2.$$

Задача K13.14.

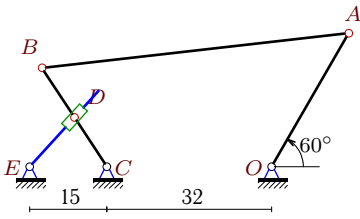
3



$$\omega_{OA} = 28\frac{1}{c}, \alpha = 60^\circ, OA = 40, AB = 72, OD = OA/2.$$

Задача K13.15.

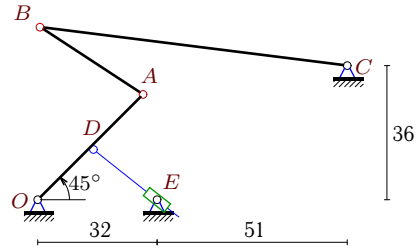
3



$$\omega_{OA} = 11\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 60, BC = 23, BD = BC/2.$$

Задача K13.16.

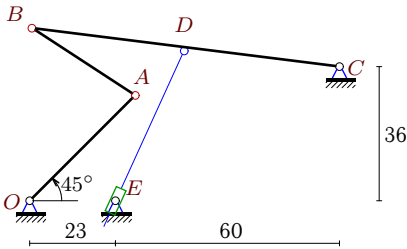
3



$$\omega_{OA} = 22\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 33, BC = 83, OD = OA/2.$$

Задача K13.17.

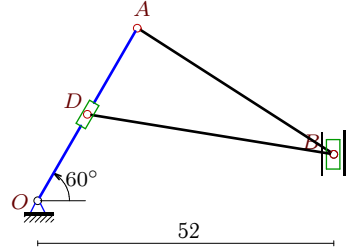
3



$$\omega_{OA} = 28\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 33, BC = 83, BD = BC/2.$$

Задача K13.18.

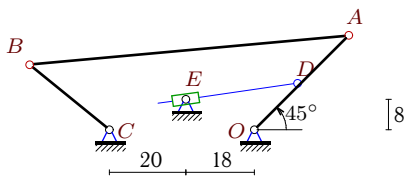
3



$$\omega_{OA} = 4\frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 41, OD = OA/2.$$

Задача K13.19.

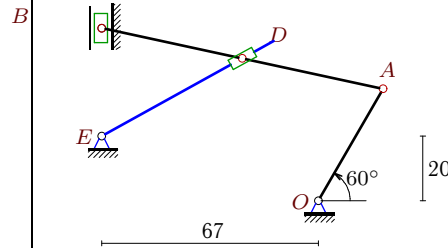
3



$$\omega_{OA} = 30\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 84, BC = 27, OD = OA/2.$$

Задача K13.20.

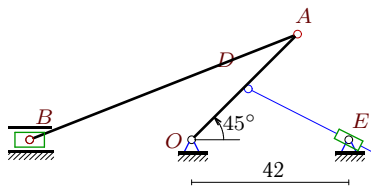
3



$$\omega_{OA} = 24\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 89, AD = AB/2.$$

Задача K13.21.

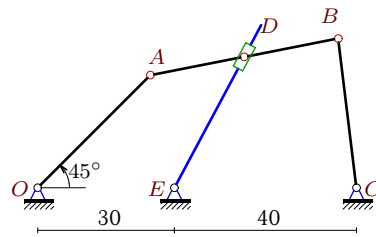
3



$$\omega_{OA} = 16\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 77, OD = OA/2.$$

Задача K13.22.

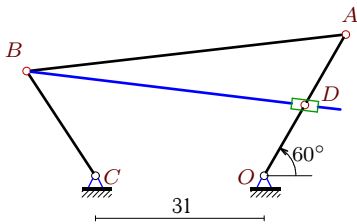
3



$$\omega_{OA} = 3\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 42, BC = 33, AD = AB/2.$$

Задача K13.23.

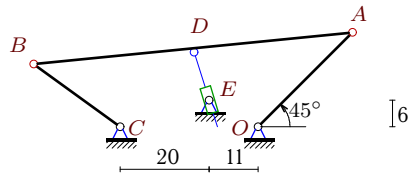
3



$$\omega_{OA} = 19\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 59, BC = 23, OD = OA/2.$$

Задача K13.24.

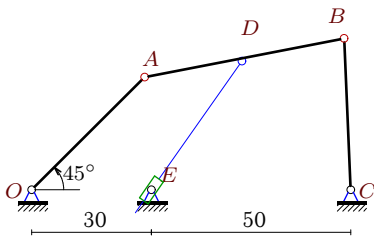
3



$$\omega_{OA} = 12\frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 72, BC = 24, AD = AB/2.$$

Задача K13.25.

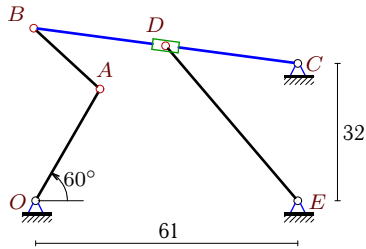
3



$$\omega_{OA} = 24\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 51, BC = 38, AD = AB/2.$$

Задача K13.26.

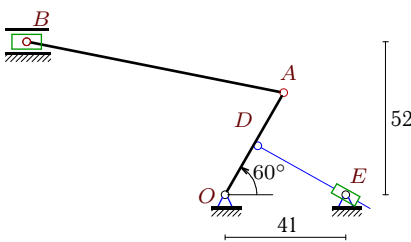
3



$$\omega_{OA} = 13\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 21, BC = 62, BD = BC/2.$$

Задача K13.27.

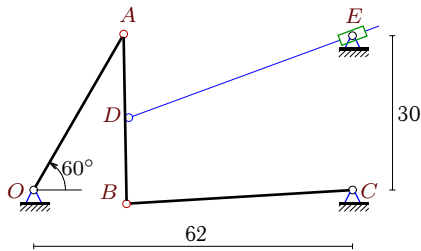
3



$$\omega_{OA} = 17\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 89, OD = OA/2.$$

Задача K13.28.

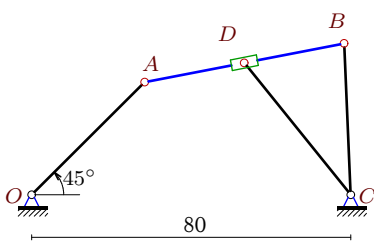
3



$$\omega_{OA} = 13\frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 33, BC = 44, AD = AB/2.$$

Задача K13.29.

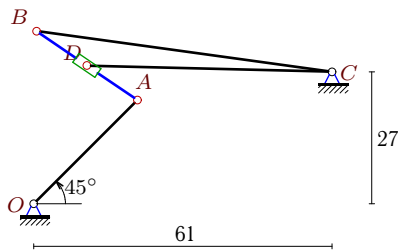
3



$$\omega_{OA} = 4\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 51, BC = 38, AD = AB/2.$$

Задача K13.30.

3



$$\omega_{OA} = 4\frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 25, BC = 61, AD = AB/2.$$

К13 Ответы.
Механизм с муфтой (1)

30.04.2012

№	v_A	v_B	v_D	v_r	x_B	y_B
1	390	351.4502	195.0000	132.7981	-44.619	19.229
2	990	917.9473	648.7216	487.7396	-57.716	0.656
3	140	127.4416	89.8455	102.4274	-57.898	17.096
4	120	108.1385	97.1669	118.8449	-44.619	19.229
5	120	101.1350	61.3058	105.5485	-78.039	0.080
6	780	746.6671	373.3335	373.2805	-51.437	14.078
7	750	2866.2478	375.0000	-816.0192	-49.000	37.154
8	750	674.2031	606.6581	751.5778	-43.613	19.233
9	1155	1120.4490	577.5000	-574.8448	-57.885	46.000
10	770	1723.6334	861.8167	-836.9151	0.689	40.940
11	140	109.8309	54.9154	42.5652	28.220	-5.050
12	780	755.2310	390.0000	3302.5553	-48.683	39.000
13	1080	4877.1287	540.0000	-1531.4414	-67.000	53.403
14	1120	1193.0773	560.0000	-559.7885	-43.000	-0.216
15	330	297.3809	148.6905	143.8790	-44.619	19.229
16	880	1966.1522	440.0000	-437.0634	0.643	46.311
17	1120	2502.3755	1251.1878	-1193.6737	0.643	46.311
18	140	258.8198	70.0000	-67.8268	52.000	8.158
19	1050	958.2507	525.0000	314.5232	-58.902	17.092
20	960	4335.2255	2443.2354	-799.9811	-67.000	53.403
21	640	273.8199	320.0000	-304.1907	-43.333	0.000
22	105	58.8761	74.3363	1.6888	65.979	32.754
23	570	512.3944	285.0000	-128.9774	-43.613	19.233
24	360	343.4627	228.3607	-56.2619	-50.433	14.084
25	960	543.5563	693.2561	83.7779	78.357	37.964
26	390	663.3518	331.6759	-298.6124	-0.456	40.198
27	680	656.5111	340.0000	-339.9663	-67.291	52.000
28	455	234.6343	308.1873	-112.3604	18.082	-2.684
29	160	90.5927	115.5427	-227.3310	78.357	37.964
30	120	264.2827	175.0460	34.2714	0.569	35.314

К13 файл о13к3А

№	ω_{AB}	ω_{BC}	ω_e	ε_{AB}	ε_{BC}	ε_e	a_A	a_B	a_D	a_r
1	6.505	15.280	-7.000	36.321	141.108	-6.508	50.700	62.748	25.350	8.568
2	18.192	14.343	-10.750	-44.391	190.500	-824.263	326.700	179.441	230.089	-102.343
3	2.391	4.720	2.391	5.479	20.298	6.022	5.600	8.138	6.163	0.637
4	2.002	4.702	2.002	3.439	13.359	-0.593	4.800	5.941	5.163	1.898
5	1.682	1.204	1.682	0.217	1.958	-16.314	3.600	2.046	2.478	9.825
6	15.915	31.111	-0.715	260.116	915.981	-1401.366	202.800	319.827	159.913	107.900
7	-33.269	—	-38.068	4043.436	-	5225.163	187.500	3148.043	93.750	368.776
8	12.706	29.313	12.706	133.693	512.051	-87.690	187.500	230.061	200.546	89.669
9	7.661	—	1.514	-450.082	-	-566.766	381.150	75.721	190.575	-19.091
10	-48.325	-23.939	-5.311	738.840	867.589	939.425	169.400	748.643	374.321	243.147
11	3.001	-1.894	-0.675	21.499	1.230	0.888	5.600	2.199	1.099	0.146
12	6.124	—	26.000	-283.456	-	-56409.405	202.800	40.612	101.400	34826.507
13	-49.852	—	-51.394	10747.169	-	12402.334	291.600	10068.840	145.800	2038.844
14	27.827	—	0.423	-949.662	-	-443.777	313.600	596.605	156.800	-4.374
15	5.504	12.930	2.895	26.005	101.030	-56.641	36.300	44.926	22.463	15.007
16	-48.068	-23.689	2.228	697.967	835.965	-507.600	193.600	835.676	96.800	-12.296
17	-61.178	-30.149	-8.286	1130.591	1354.125	1604.509	313.600	1353.658	676.829	392.004
18	5.473	—	4.000	59.289	-	-1.749	5.600	22.241	2.800	-25.045
19	17.744	35.491	-13.698	310.631	1163.499	26.691	315.000	462.978	157.500	68.527
20	-44.313	—	46.457	8491.591	-	-8622.976	230.400	7955.627	4077.986	949.092
21	6.319	—	3.180	-85.334	-	-217.703	102.400	67.947	51.200	-19.053
22	-1.975	1.784	2.280	2.394	12.685	5.964	3.150	4.316	3.654	1.447
23	9.656	22.278	8.591	77.221	295.760	114.763	108.300	132.883	54.150	4.951
24	7.435	14.311	-18.148	54.808	190.553	-18.435	43.200	67.138	49.006	3.281
25	-14.026	14.304	-16.988	183.841	744.334	-336.842	230.400	293.339	254.660	113.723
26	-29.926	-10.699	-10.699	529.032	396.403	450.372	50.700	255.813	127.906	147.116
27	3.895	—	0.135	-117.706	-	-165.334	115.600	24.124	57.800	-0.820
28	11.509	-5.333	6.096	131.215	17.130	-80.853	59.150	14.607	30.161	-35.267
29	-2.338	2.384	-2.338	5.107	20.676	39.503	6.400	8.148	7.074	5.479
30	-8.572	-4.333	-8.572	18.738	26.581	36.840	4.800	19.850	10.894	5.706