

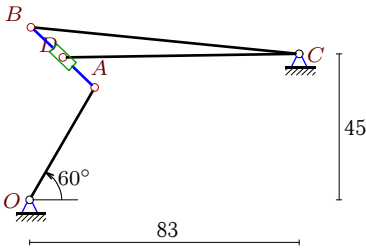
Механизм с муфтой (1)

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.

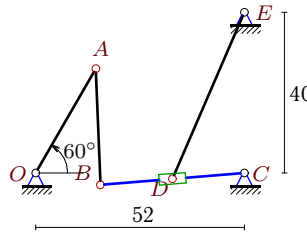
4



$$\omega_{OA} = 10\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 27, BC = 83, AD = AB/2.$$

Задача K13.2.

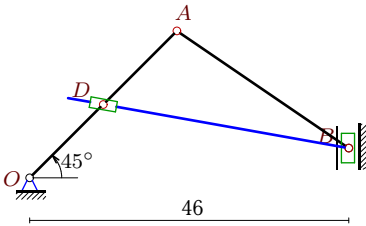
4



$$\omega_{OA} = 6\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 29, BC = 36, BD = BC/2.$$

Задача K13.3.

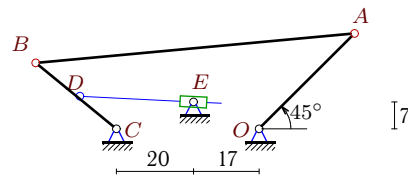
4



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

Задача K13.4.

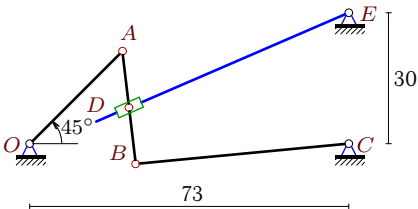
4



$$\omega_{OA} = 33\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 83, BC = 27, BD = BC/2.$$

Задача K13.5.

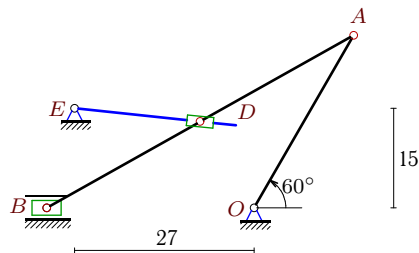
4



$$\omega_{OA} = 21\frac{1}{c}, \alpha = 45^\circ, OA = 30, \\ AB = 26, BC = 49, AD = AB/2.$$

Задача K13.6.

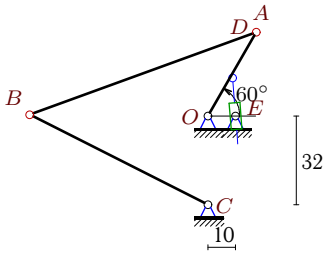
4



$$\omega_{OA} = 21\frac{1}{c}, \alpha = 60^\circ, OA = 30, \\ AB = 53, AD = AB/2.$$

Задача K13.7.

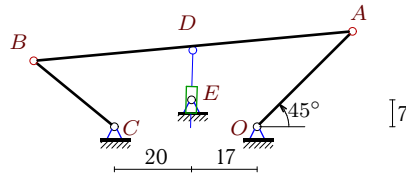
4



$$\omega_{OA} = 4\frac{1}{c}, \alpha = 60^\circ, OA = 35, \\ AB = 87, BC = 72, OD = OA/2.$$

Задача K13.8.

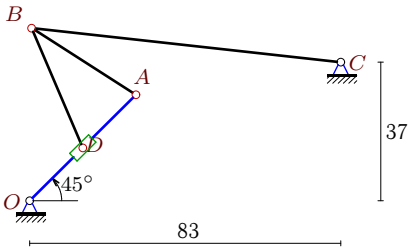
4



$$\omega_{OA} = 30\frac{1}{c}, \alpha = 45^\circ, OA = 35, \\ AB = 83, BC = 27, AD = AB/2.$$

Задача K13.9.

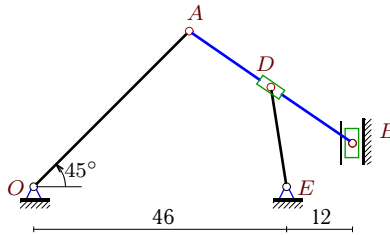
4



$$\omega_{OA} = 23\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 33, BC = 83, OD = OA/2.$$

Задача K13.10.

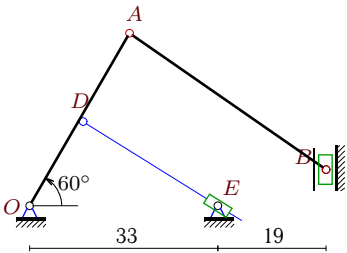
4



$$\omega_{OA} = 4\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 36, AD = AB/2.$$

Задача K13.11.

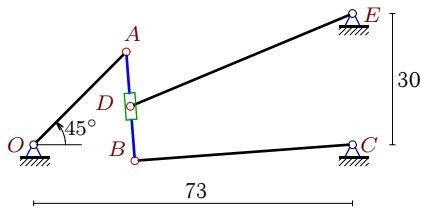
4



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

Задача K13.12.

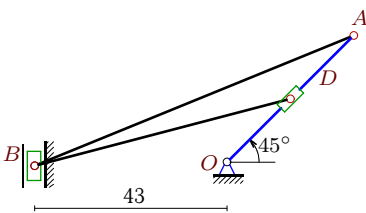
4



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

Задача K13.13.

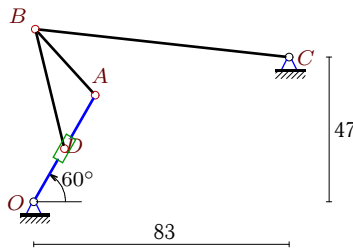
4



$$\omega_{OA} = 29\frac{1}{c}, \alpha = 45^\circ, OA = 40, \\ AB = 77, OD = OA/2.$$

Задача K13.14.

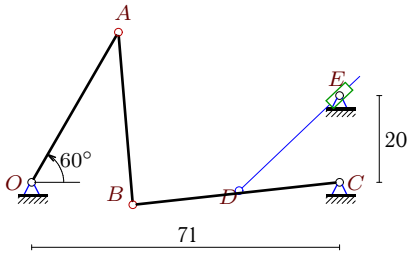
4



$$\omega_{OA} = 26\frac{1}{c}, \alpha = 60^\circ, OA = 40, \\ AB = 29, BC = 83, OD = OA/2.$$

Задача K13.15.

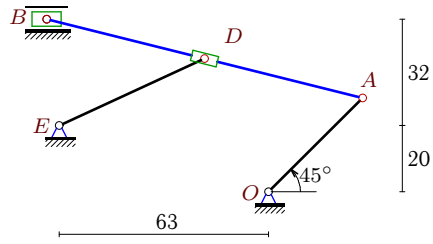
4



$\omega_{OA} = 6\frac{1}{c}$, $\alpha = 60^\circ$, $OA = 40$,
 $AB = 40$, $BC = 48$, $BD = BC/2$.

Задача K13.16.

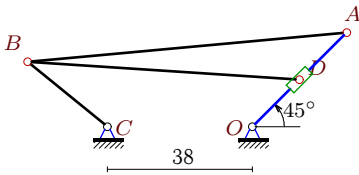
4



$\omega_{OA} = 19\frac{1}{c}$, $\alpha = 45^\circ$, $OA = 40$,
 $AB = 98$, $AD = AB/2$.

Задача K13.17.

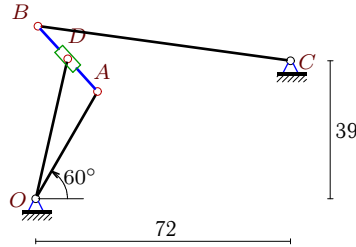
4



$\omega_{OA} = 21\frac{1}{c}$, $\alpha = 45^\circ$, $OA = 35$,
 $AB = 84$, $BC = 27$, $OD = OA/2$.

Задача K13.18.

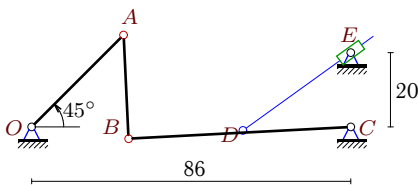
4



$\omega_{OA} = 16\frac{1}{c}$, $\alpha = 60^\circ$, $OA = 35$,
 $AB = 25$, $BC = 72$, $AD = AB/2$.

Задача K13.19.

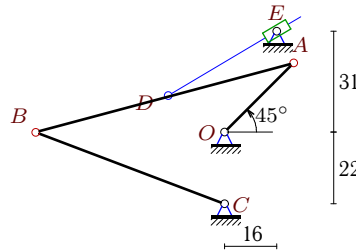
4



$\omega_{OA} = 3\frac{1}{c}$, $\alpha = 45^\circ$, $OA = 35$,
 $AB = 28$, $BC = 60$, $BD = BC/2$.

Задача K13.20.

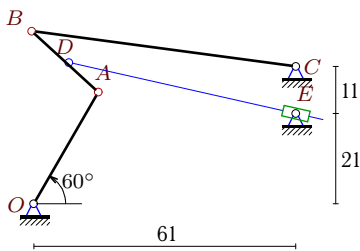
4



$\omega_{OA} = 11\frac{1}{c}$, $\alpha = 45^\circ$, $OA = 30$,
 $AB = 82$, $BC = 62$, $AD = AB/2$.

Задача K13.21.

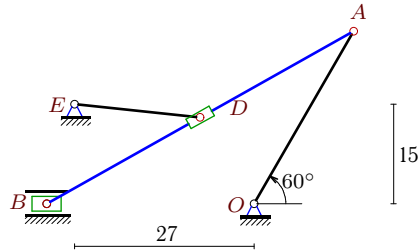
4



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

Задача K13.22.

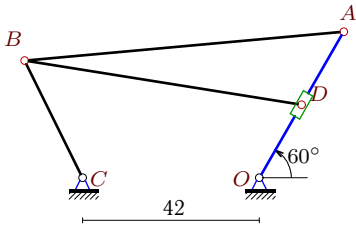
4



$\omega_{OA} = 29\frac{1}{c}$, $\alpha = 60^\circ$, $OA = 30$,
 $AB = 53$, $AD = AB/2$.

Задача K13.23.

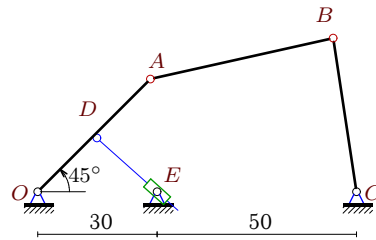
4



$$\omega_{OA} = 15\frac{1}{c}, \alpha = 60^\circ, OA = 40, AB = 76, BC = 31, OD = OA/2.$$

Задача K13.24.

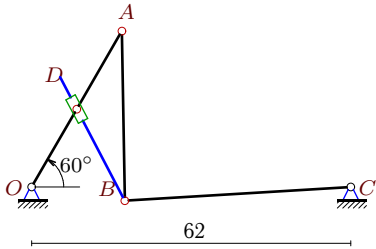
4



$$\omega_{OA} = 14\frac{1}{c}, \alpha = 45^\circ, OA = 40, AB = 47, BC = 39, OD = OA/2.$$

Задача K13.25.

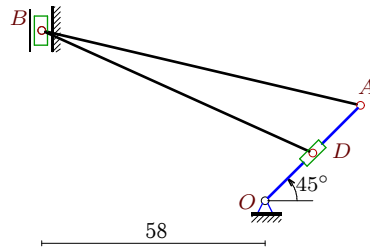
4



$$\omega_{OA} = 31\frac{1}{c}, \alpha = 60^\circ, OA = 35, AB = 33, BC = 44, OD = OA/2.$$

Задача K13.26.

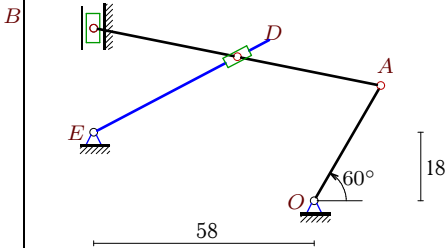
4



$$\omega_{OA} = 5\frac{1}{c}, \alpha = 45^\circ, OA = 35, AB = 85, OD = OA/2.$$

Задача K13.27.

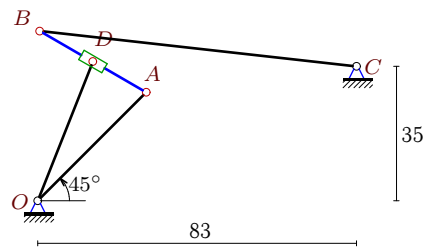
4



$$\omega_{OA} = 17\frac{1}{c}, \alpha = 60^\circ, OA = 35, AB = 77, AD = AB/2.$$

Задача K13.28.

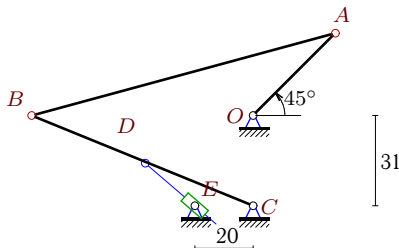
4



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

Задача K13.29.

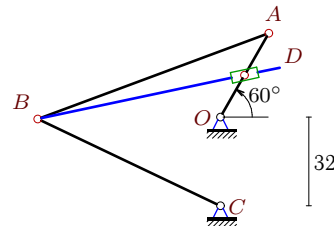
4



$$\omega_{OA} = 32\frac{1}{c}, \alpha = 45^\circ, OA = 40, AB = 108, BC = 82, BD = BC/2.$$

Задача K13.30.

4



$$\omega_{OA} = 33\frac{1}{c}, \alpha = 60^\circ, OA = 35, AB = 89, BC = 73, OD = OA/2.$$

K13 Ответы.
Механизм с муфтой (1)

30.04.2012

№	v_A	v_B	v_D	v_r	x_B	y_B
1	400	634.7166	439.3054	189.6067	0.408	53.219
2	180	96.0749	48.0374	89.7695	16.125	-2.997
3	120	209.3032	60.0000	-12.5560	46.000	4.313
4	1155	1051.3929	525.6964	-311.7789	-57.898	17.096
5	630	494.0841	529.3179	-40.1594	24.218	-4.613
6	630	368.4362	483.3942	471.1058	-31.195	0.000
7	140	123.2286	70.0000	-39.8646	-64.239	0.517
8	1050	955.8117	673.8411	19.2483	-57.898	17.096
9	920	2023.7760	460.0000	-3586.0163	0.499	46.088
10	160	278.5728	203.8606	-294.7860	58.000	7.962
11	70	122.3145	35.0000	-34.9786	52.000	6.358
12	900	683.5076	743.1925	200.2029	23.138	-3.713
13	1160	1188.1707	580.0000	9.6524	-43.000	-0.828
14	1040	1496.2922	520.0000	-1448.0888	0.501	56.107
15	240	136.7137	68.3569	41.3444	23.285	-5.224
16	760	671.4346	661.4537	559.6901	-66.803	52.000
17	735	670.7755	367.5000	171.4204	-58.902	17.092
18	560	832.3946	582.7576	871.4407	0.670	48.797
19	105	77.7099	38.8549	21.0078	26.086	-3.219
20	330	282.0933	167.3115	-151.0436	-57.983	-0.046
21	390	663.3518	444.2194	-215.5444	-0.456	40.198
22	870	508.7928	667.5444	798.3496	-31.195	0.000
23	600	525.6586	300.0000	416.8151	-55.693	27.812
24	560	300.5733	280.0000	-279.5432	74.148	38.558
25	1085	559.5125	542.5000	52.5525	18.082	-2.684
26	175	650.6601	87.5000	527.0706	-58.000	44.182
27	595	2869.7549	1604.4487	-509.7249	-58.000	45.435
28	320	776.5920	503.9685	3106.2990	0.509	44.175
29	1280	1047.4233	523.7117	166.7317	-75.934	-0.047
30	1155	1027.8191	577.5000	-194.5630	-65.934	-0.668

K13 файл o13k4A

№	ω_{AB}	ω_{BC}	ω_e	ε_{AB}	ε_{BC}	ε_e	a_A	a_B	a_D	a_r
1	-22.029	-7.647	-22.029	232.848	200.518	310.414	40.000	173.363	102.700	91.061
2	5.103	-2.669	-2.669	28.951	4.721	-9.001	10.800	3.076	1.538	3.788
3	5.021	—	4.777	57.056	-	43.243	4.800	15.009	2.400	-6.950
4	19.728	38.940	-13.883	372.943	1381.549	-606.818	381.150	553.864	276.932	-4.555
5	15.448	-10.083	-9.637	588.974	38.767	89.220	132.300	53.319	57.863	-91.570
6	6.819	—	5.697	-221.873	-	-64.127	132.300	102.315	101.867	71.534
7	2.201	1.712	-3.784	-0.733	2.887	9.352	5.600	2.961	2.800	0.124
8	17.935	35.400	-48.357	308.218	1141.776	-619.472	315.000	457.739	346.691	14.306
9	-48.985	-24.383	23.000	571.158	826.062	-9380.171	211.600	844.741	105.800	2642.786
10	5.567	—	5.567	67.591	-	-419.968	6.400	21.858	8.957	-76.180
11	2.531	—	-0.043	12.148	-	-2.342	1.400	4.513	0.700	0.024
12	23.496	-13.670	23.496	1193.540	74.772	-1732.297	270.000	100.638	120.391	1062.104
13	28.175	—	29.000	-1126.635	-	-1568.901	336.400	796.344	168.200	132.072
14	-49.606	-18.028	26.000	814.940	1080.871	-4710.006	270.400	936.799	135.200	1876.416
15	4.841	-2.848	1.656	30.403	5.355	-2.530	14.400	4.666	2.333	-0.128
16	5.652	—	5.652	-115.348	-	-3.195	144.400	44.378	89.280	56.186
17	12.421	24.844	21.000	152.209	570.114	134.690	154.350	226.859	77.175	27.084
18	-32.361	-11.561	-32.361	442.473	466.238	2898.373	89.600	349.213	211.644	-1100.865
19	2.506	-1.295	0.885	11.928	0.611	-0.147	3.150	1.071	0.536	0.035
20	6.278	4.550	1.800	3.192	26.341	-50.082	36.300	20.771	24.735	-21.267
21	-29.926	-10.699	7.053	529.032	396.403	-315.707	50.700	255.813	148.584	11.292
22	9.417	—	9.417	-423.119	-	126.311	252.300	195.117	194.264	46.766
23	7.031	16.957	15.000	36.074	159.967	-330.834	90.000	102.000	45.000	251.380
24	-9.617	7.707	0.752	56.211	277.785	-203.986	78.400	110.785	39.200	-2.359
25	27.444	-12.716	25.788	746.142	97.407	1075.598	336.350	83.060	168.175	-112.003
26	-6.368	—	5.000	140.817	-	-349.218	8.750	130.591	4.375	391.193
27	-34.070	—	35.660	5459.902	-	-5463.400	101.150	4385.380	2236.632	521.695
28	-19.642	-9.357	-19.642	193.545	151.693	-13680.966	25.600	145.368	78.259	5513.999
29	17.991	12.773	-20.936	22.715	225.322	-573.898	409.600	228.118	114.059	-11.112
30	18.048	14.080	15.756	-42.309	199.841	0.993	381.150	205.485	190.575	-35.674