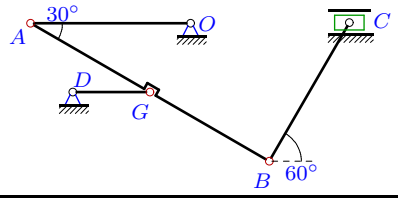
Кинематический анализ механизма (4 звена)

Найти скорости и ускорения шарниров плоского механизма.

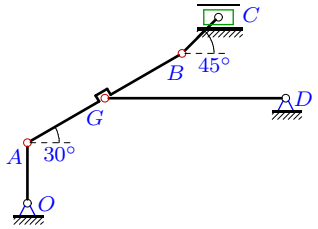
Кирсанов М.Н. **Решебник. Теоретическая механика**/Под ред. А. И. Кириллова.– М.:ФИЗМАТЛИТ, 2002.– 384 с. (с.279.)

Задача 7.1. 6



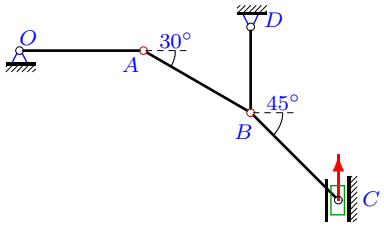
$\omega_{DG} = 3$ рад/с,
$OA = 29$ см,
$BG = 25$ см,
$DG = 14$ см,
$AG = 25$ см,
$BC = 29$ см.

Задача 7.2. 6



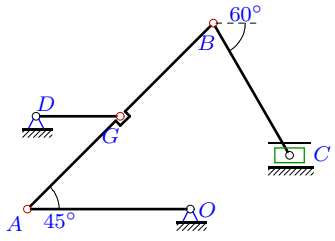
$\omega_{OA} = 2$ рад/с,
$OA = 27$ см,
$BG = 40$ см,
$DG = 81$ см,
$AG = 40$ см,
$BC = 23$ см.

Задача 7.3. 6



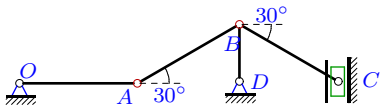
$v_c = 10$ см/с,
$OA = 26$ см,
$DB = 18$ см,
$AB = 26$ см,
$BC = 26$ см.

Задача 7.4. 6



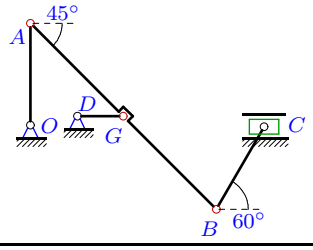
$\omega_{DG} = 4$ рад/с,
$OA = 31$ см,
$BG = 25$ см,
$DG = 16$ см,
$AG = 25$ см,
$BC = 29$ см.

Задача 7.5. 6



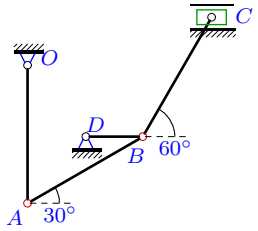
$\omega_{DB} = 5$ рад/с,
$OA = 33$ см,
$DB = 16$ см,
$AB = 33$ см,
$BC = 32$ см.

Задача 7.6. 6



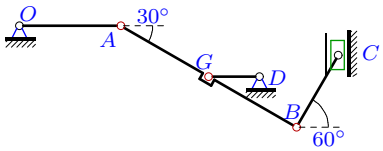
$\omega_{DG} = 7$ рад/с,
$OA = 31$ см,
$BG = 40$ см,
$DG = 14$ см,
$AG = 40$ см,
$BC = 29$ см.

Задача 7.7. 6



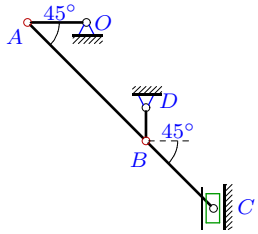
$\omega_{OA} = 3$ рад/с,
$OA = 29$ см,
$DB = 12$ см,
$AB = 28$ см,
$BC = 29$ см.

Задача 7.8. 6



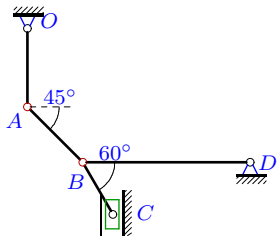
$\omega_{OA} = 3$ рад/с,
$OA = 28$ см,
$BG = 28$ см,
$DG = 14$ см,
$AG = 28$ см,
$BC = 23$ см.

Задача 7.9. 6



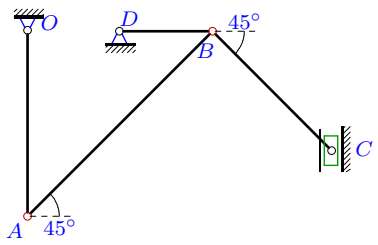
$\omega_{OA} = 6$ рад/с,
$OA = 32$ см,
$DB = 18$ см,
$AB = 91$ см,
$BC = 52$ см.

Задача 7.10. 6



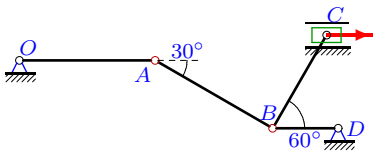
$\omega_{OA} = 7$ рад/с,
$OA = 30$ см,
$DB = 64$ см,
$AB = 30$ см,
$BC = 23$ см.

Задача 7.11. 6



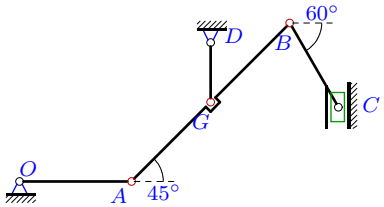
$\omega_{OA} = 1$ рад/с,
$OA = 32$ см,
$DB = 16$ см,
$AB = 45$ см,
$BC = 29$ см.

Задача 7.12. 6



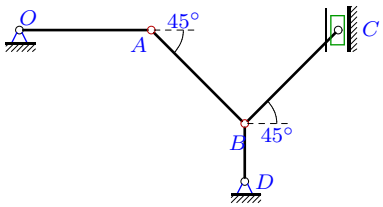
$v_c = 20$ см/с,
$OA = 29$ см,
$DB = 14$ см,
$AB = 29$ см,
$BC = 23$ см.

Задача 7.13. 6



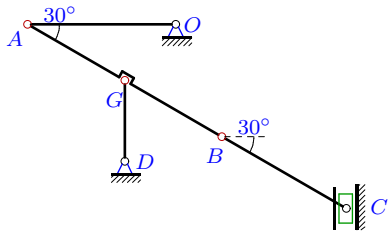
$\omega_{OA} = 8$ рад/с,
$OA = 30$ см,
$BG = 30$ см,
$DG = 16$ см,
$AG = 30$ см,
$BC = 26$ см.

Задача 7.14. 6



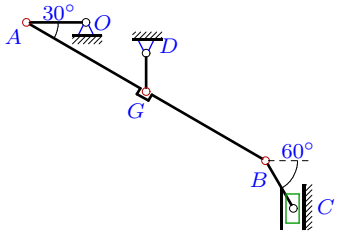
$\omega_{DB} = 2$ рад/с,
$OA = 32$ см,
$DB = 14$ см,
$AB = 32$ см,
$BC = 32$ см.

Задача 7.15. 6



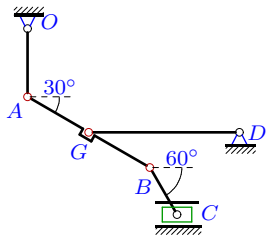
$\omega_{DG} = 8$ рад/с,
$OA = 33$ см,
$BG = 25$ см,
$DG = 18$ см,
$AG = 25$ см,
$BC = 32$ см.

Задача 7.16. 6



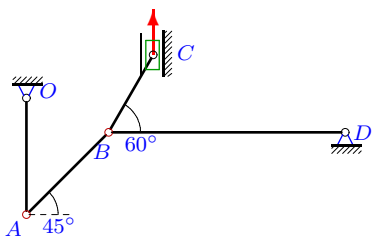
$\omega_{OA} = 4$ рад/с,
$OA = 28$ см,
$BG = 65$ см,
$DG = 18$ см,
$AG = 65$ см,
$BC = 26$ см.

Задача 7.17. 6



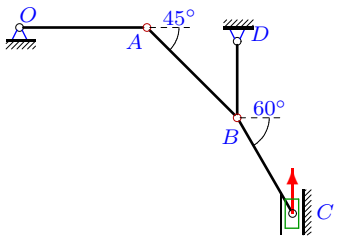
$\omega_{DG} = 4$ рад/с,
$OA = 29$ см,
$BG = 30$ см,
$DG = 64$ см,
$AG = 30$ см,
$BC = 23$ см.

Задача 7.18. 6



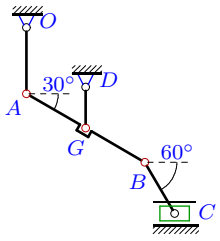
$v_c = 20$ см/с,
$OA = 30$ см,
$DB = 61$ см,
$AB = 30$ см,
$BC = 23$ см.

Задача 7.19. 6



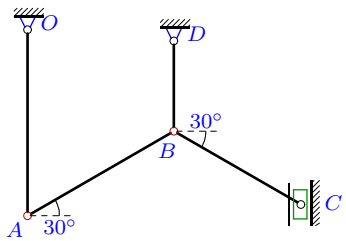
$v_c = 5$ см/с,
$OA = 30$ см,
$DB = 18$ см,
$AB = 30$ см,
$BC = 26$ см.

Задача 7.20. 6



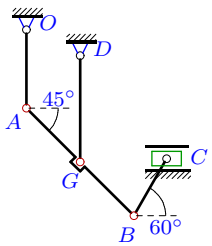
$\omega_{OA} = 7$ рад/с,
$OA = 29$ см,
$BG = 30$ см,
$DG = 18$ см,
$AG = 30$ см,
$BC = 26$ см.

Задача 7.21. 6



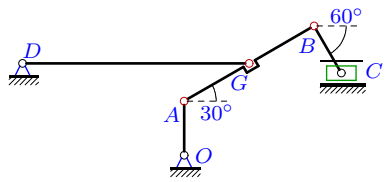
$\omega_{OA} = 2$ рад/с,
$OA = 33$ см,
$DB = 16$ см,
$AB = 30$ см,
$BC = 26$ см.

Задача 7.22. 6



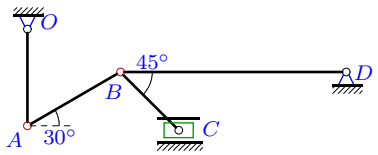
$\omega_{DG} = 5$ рад/с,
$OA = 31$ см,
$BG = 30$ см,
$DG = 42$ см,
$AG = 30$ см,
$BC = 26$ см.

Задача 7.23. 6



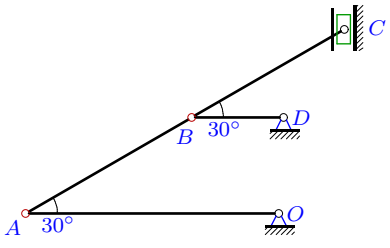
$\omega_{DG} = 3$ рад/с,
$OA = 29$ см,
$BG = 40$ см,
$DG = 121$ см,
$AG = 40$ см,
$BC = 29$ см.

Задача 7.24. 6



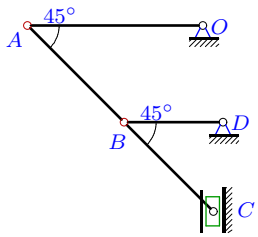
$\omega_{OA} = 2$ рад/с,
$OA = 27$ см,
$DB = 63$ см,
$AB = 30$ см,
$BC = 23$ см.

Задача 7.25. 6



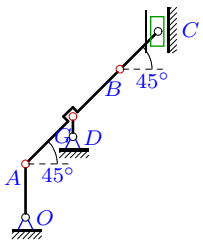
$\omega_{OA} = 8$ рад/с,
$OA = 33$ см,
$DB = 12$ см,
$AB = 25$ см,
$BC = 23$ см.

Задача 7.26. 6



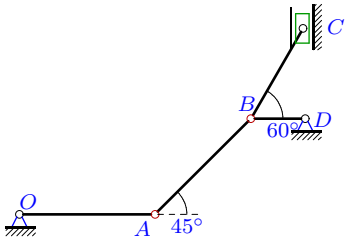
$\omega_{OA} = 9$ рад/с,
$OA = 32$ см,
$DB = 18$ см,
$AB = 25$ см,
$BC = 23$ см.

Задача 7.27. 6



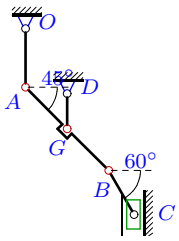
$\omega_{DG} = 6$ рад/с,
$OA = 32$ см,
$BG = 40$ см,
$DG = 12$ см,
$AG = 40$ см,
$BC = 32$ см.

Задача 7.28. 6



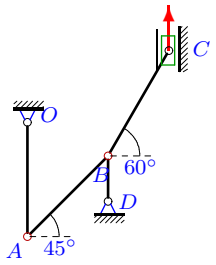
$\omega_{OA} = 1$ рад/с,
$OA = 30$ см,
$DB = 12$ см,
$AB = 30$ см,
$BC = 23$ см.

Задача 7.29. 6



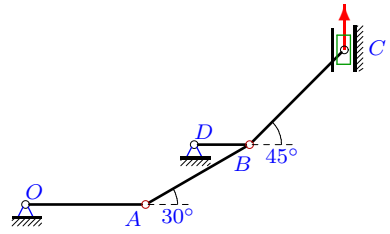
$\omega_{OA} = 7$ рад/с,
$OA = 30$ см,
$BG = 30$ см,
$DG = 18$ см,
$AG = 30$ см,
$BC = 26$ см.

Задача 7.30. 6



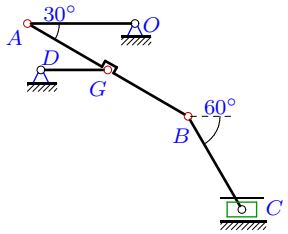
$v_c = 10$ см/с,
$OA = 30$ см,
$DB = 12$ см,
$AB = 30$ см,
$BC = 32$ см.

Задача 7.31. 6



$v_c = 5$ см/с,
$OA = 26$ см,
$DB = 12$ см,
$AB = 26$ см,
$BC = 29$ см.

Задача 7.32. 6



$\omega_{OA} = 6$ рад/с,
$OA = 29$ см,
$BG = 25$ см,
$DG = 18$ см,
$AG = 25$ см,
$BC = 29$ см.

7.6

Кинематический анализ механизма (4 звена)

n	v_A	v_B	v_C	v_G	a_A	a_B	a_C	a_G
1	0.420	0.420	0.727	0.420	3.293	4.501	13.599	1.260
2	0.540	1.947	1.331	0.935	1.080	16.626	57.357	8.849
3	0.173	0.100	0.100*	–	0.746	0.173	0.000	–
4	0.640	0.640	1.109	0.640	4.100	7.520	24.463	2.560
5	1.386	0.800	1.386	–	22.363	4.000	12.000	–
6	0.980	2.191	4.375	0.980	4.430	10.998	111.162	6.860
7	0.870	1.507	2.610	–	2.610	23.396	57.731	–
8	0.840	0.840	0.840	0.840	2.520	29.062	33.463	14.031
9	1.920	1.920	1.920	–	11.520	29.007	19.989	–
10	2.100	2.100	2.100	–	14.700	63.543	59.190	–
11	0.320	0.320	0.320	–	0.320	0.714	0.956	–
12	0.115	0.115	0.200*	–	0.056	0.233	0.000	–
13	2.400	5.367	5.171	2.400	19.200	212.388	323.794	115.272
14	0.280	0.280	0.280	–	1.518	0.560	1.253	–
15	2.494	3.810	2.494	1.440	48.996	29.112	262.195	11.520
16	1.120	1.711	0.373	0.647	4.480	4.803	13.846	3.677
17	1.478	5.329	7.390	2.560	48.807	28.747	926.500	10.240
18	0.200	0.200	0.200*	–	0.302	0.076	0.000	–
19	0.087	0.087	0.050*	–	0.205	0.155	0.000	–
20	2.030	2.030	2.030	2.030	14.210	33.132	44.667	23.436
21	0.660	0.660	1.143	–	1.320	2.840	17.528	–
22	2.100	2.100	2.100	2.100	14.706	7.731	8.007	10.500
23	2.096	7.556	14.670	3.630	50.879	71.964	1550.589	10.890
24	0.540	0.935	0.935	–	1.080	9.206	0.268	–
25	2.640	2.640	2.640	–	21.120	86.437	36.581	–
26	2.880	2.880	2.880	–	25.920	50.297	25.920	–
27	0.720	0.720	0.720	0.720	3.149	7.521	8.902	4.320
28	0.300	0.300	0.300	–	0.300	1.290	0.617	–
29	2.100	2.100	1.212	2.100	14.700	39.505	49.098	26.387
30	0.173	0.173	0.100*	–	0.348	0.727	0.000	–
31	0.050	0.050	0.050*	–	0.010	0.029	0.000	–
32	1.740	1.740	3.014	1.740	10.440	104.213	35.960	50.122

№	ω_{OA}	ω_{DB}	ω_{DG}	ω_{AB}	ω_{BC}	ε_{AB}	ε_{BC}
1	-1.448	–	3.000	0.000	-2.897	-14.946	36.849
2	2.000	–	1.155	-2.700	11.502	-18.027	233.659
3	0.666	-0.556	–	-0.769	0.544	3.177	-0.598
4	-2.065	–	4.000	0.000	-4.414	21.956	-60.511
5	-4.199	5.000	–	4.848	5.000	-75.978	43.301
6	3.161	–	7.000	3.465	-13.517	-1.052	295.107
7	3.000	12.557	–	6.214	-10.392	68.274	92.172
8	3.000	–	-6.000	0.000	0.000	54.000	63.258
9	6.000	10.667	–	2.984	-5.222	22.924	-28.601
10	7.000	3.281	–	-9.899	0.000	130.483	-34.594
11	1.000	2.000	–	1.006	-0.000	1.000	3.121
12	0.398	-0.825	–	0.000	-1.004	0.974	-0.104
13	8.000	–	15.000	-11.314	-21.318	297.706	1149.764
14	0.875	2.000	–	-1.237	-1.237	2.614	-1.531
15	-7.558	–	8.000	-11.520	18.000	79.054	679.003
16	4.000	–	3.592	1.990	-5.744	1.841	13.628
17	5.097	–	4.000	-9.853	44.522	-85.049	-3367.742
18	0.667	-0.328	–	0.943	0.000	0.082	0.329
19	0.289	-0.481	–	-0.408	0.385	0.987	-0.577
20	7.000	–	11.278	0.000	0.000	33.424	-242.906
21	2.000	4.125	–	0.000	-5.077	5.398	50.873
22	6.774	–	5.000	0.000	0.000	-17.564	-52.109
23	-7.227	–	3.000	10.479	-50.069	107.120	-4446.535
24	2.000	-1.485	–	3.600	-5.751	-31.705	22.887
25	8.000	22.000	–	0.000	-0.000	-295.680	505.043
26	9.000	16.000	–	0.000	0.000	114.042	-283.335
27	2.250	–	6.000	0.000	-3.182	-9.546	1.807
28	1.000	-2.500	–	0.000	0.000	-4.950	3.765
29	7.000	–	11.667	0.000	-9.326	46.198	-36.827
30	0.577	-1.443	–	0.000	0.625	-1.650	2.239
31	0.192	0.417	–	0.000	0.000	0.086	-0.102
32	6.000	–	-9.667	0.000	12.000	-218.080	401.836