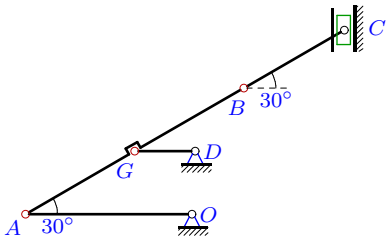
Кинематический анализ механизма (4 звена)

Найти скорости и ускорения шарниров плоского механизма.

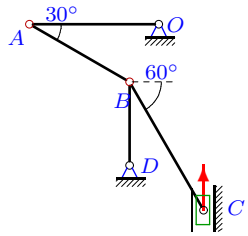
Кирсанов М.Н. **Решебник. Теоретическая механика**/Под ред. А. И. Кириллова.– М.:ФИЗМАТЛИТ, 2002.– 384 с. (с.279.)

Задача 7.1. 9



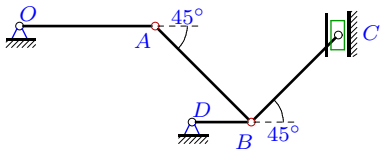
$\omega_{OA} = 3$ рад/с,
$OA = 33$ см,
$BG = 25$ см,
$DG = 12$ см,
$AG = 25$ см,
$BC = 23$ см.

Задача 7.2. 9



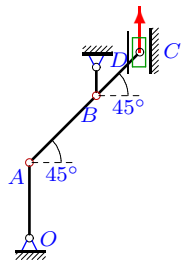
$v_c = 40$ см/с,
$OA = 28$ см,
$DB = 18$ см,
$AB = 25$ см,
$BC = 32$ см.

Задача 7.3. 9



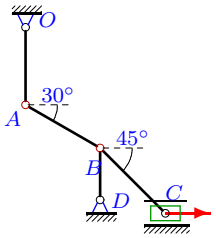
$\omega_{OA} = 3$ рад/с,
$OA = 32$ см,
$DB = 14$ см,
$AB = 32$ см,
$BC = 29$ см.

Задача 7.4. 9



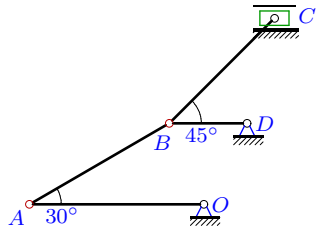
$v_c = 5$ см/с,
$OA = 32$ см,
$DB = 12$ см,
$AB = 40$ см,
$BC = 26$ см.

Задача 7.5. 9



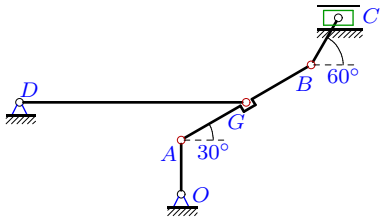
$v_c = 30$ см/с,
$OA = 27$ см,
$DB = 18$ см,
$AB = 30$ см,
$BC = 32$ см.

Задача 7.6. 9



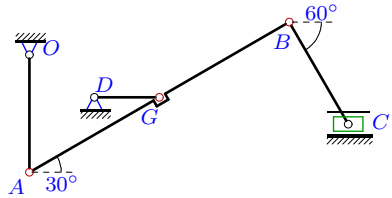
$\omega_{DB} = 9$ рад/с,
$OA = 27$ см,
$DB = 12$ см,
$AB = 25$ см,
$BC = 23$ см.

Задача 7.7. 9



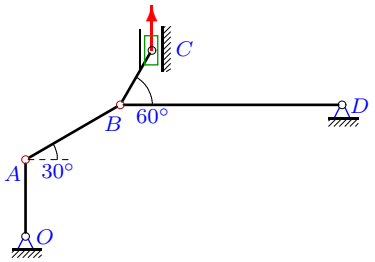
$\omega_{DG} = 5$ рад/с,
$OA = 29$ см,
$BG = 40$ см,
$DG = 121$ см,
$AG = 40$ см,
$BC = 29$ см.

Задача 7.8. 9



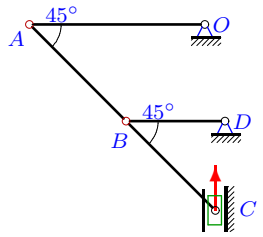
$\omega_{DG} = 7$ рад/с,
$OA = 29$ см,
$BG = 37$ см,
$DG = 16$ см,
$AG = 37$ см,
$BC = 29$ см.

Задача 7.9. 9



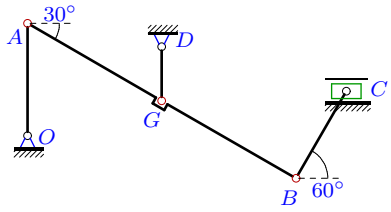
$v_c = 10$ см/с,
$OA = 28$ см,
$DB = 81$ см,
$AB = 40$ см,
$BC = 23$ см.

Задача 7.10. 9



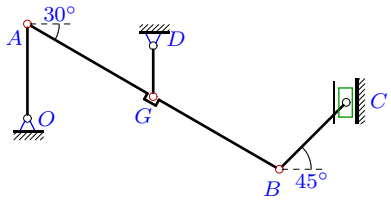
$v_c = 5$ см/с,
$OA = 32$ см,
$DB = 18$ см,
$AB = 25$ см,
$BC = 23$ см.

Задача 7.11. 9



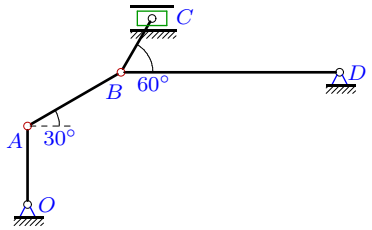
$\omega_{DG} = 1$ рад/с,
$OA = 29$ см,
$BG = 40$ см,
$DG = 14$ см,
$AG = 40$ см,
$BC = 26$ см.

Задача 7.12. 9



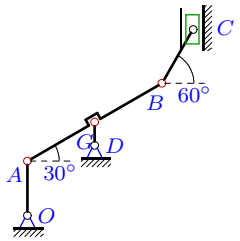
$\omega_{DG} = 5$ рад/с,
$OA = 26$ см,
$BG = 40$ см,
$DG = 14$ см,
$AG = 40$ см,
$BC = 26$ см.

Задача 7.13. 9



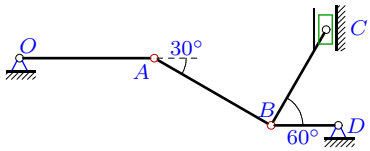
$\omega_{OA} = 1$ рад/с,
$OA = 29$ см,
$DB = 81$ см,
$AB = 40$ см,
$BC = 23$ см.

Задача 7.14. 9



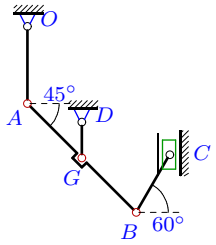
$\omega_{OA} = 7$ рад/с,
$OA = 28$ см,
$BG = 40$ см,
$DG = 12$ см,
$AG = 40$ см,
$BC = 32$ см.

Задача 7.15. 9



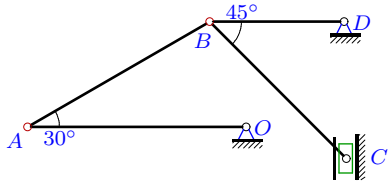
$\omega_{OA} = 8$ рад/с,
$OA = 28$ см,
$DB = 14$ см,
$AB = 28$ см,
$BC = 23$ см.

Задача 7.16. 9



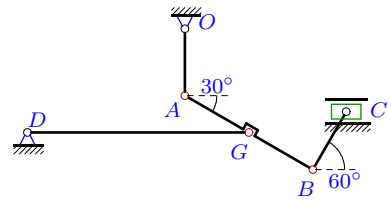
$\omega_{DG} = 7$ рад/с,
$OA = 30$ см,
$BG = 30$ см,
$DG = 14$ см,
$AG = 30$ см,
$BC = 26$ см.

Задача 7.17. 9



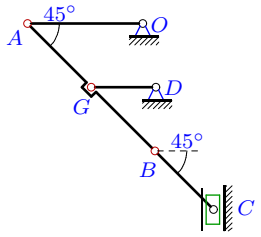
$\omega_{OA} = 4$ рад/с,
$OA = 26$ см,
$DB = 16$ см,
$AB = 25$ см,
$BC = 23$ см.

Задача 7.18. 9



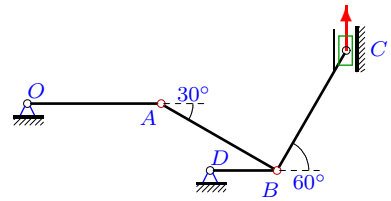
$\omega_{OA} = 2$ рад/с,
$OA = 29$ см,
$BG = 32$ см,
$DG = 96$ см,
$AG = 32$ см,
$BC = 29$ см.

Задача 7.19. 9



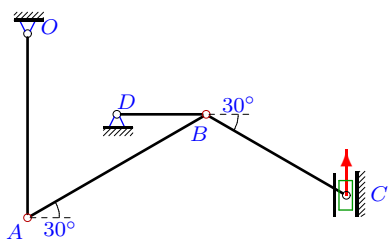
$\omega_{DG} = 6$ рад/с,
$OA = 32$ см,
$BG = 25$ см,
$DG = 18$ см,
$AG = 25$ см,
$BC = 23$ см.

Задача 7.20. 9



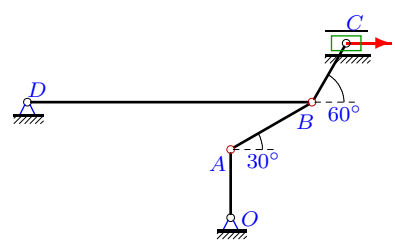
$v_c = 35$ см/с,
$OA = 28$ см,
$DB = 14$ см,
$AB = 28$ см,
$BC = 29$ см.

Задача 7.21. 9



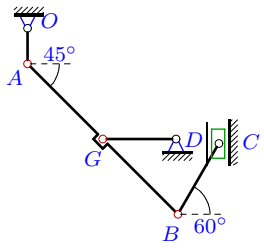
$v_c = 5$ см/с,
$OA = 33$ см,
$DB = 16$ см,
$AB = 37$ см,
$BC = 29$ см.

Задача 7.22. 9



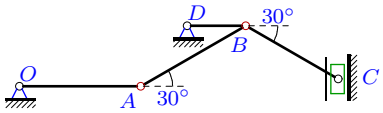
$v_c = 25$ см/с,
$OA = 29$ см,
$DB = 121$ см,
$AB = 40$ см,
$BC = 29$ см.

Задача 7.23. 9



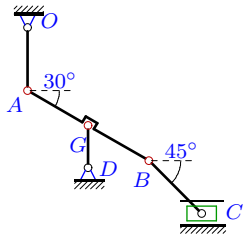
$\omega_{DG} = 6$ рад/с,
$OA = 30$ см,
$BG = 90$ см,
$DG = 62$ см,
$AG = 90$ см,
$BC = 69$ см.

Задача 7.24. 9



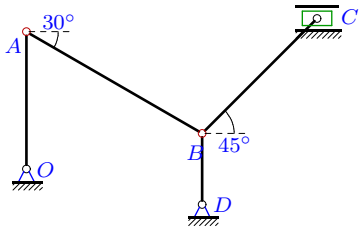
$\omega_{DB} = 6$ рад/с,
$OA = 33$ см,
$DB = 16$ см,
$AB = 33$ см,
$BC = 29$ см.

Задача 7.25. 9



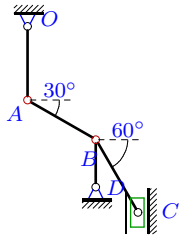
$\omega_{DG} = 6$ рад/с,
$OA = 27$ см,
$BG = 30$ см,
$DG = 18$ см,
$AG = 30$ см,
$BC = 32$ см.

Задача 7.26. 9



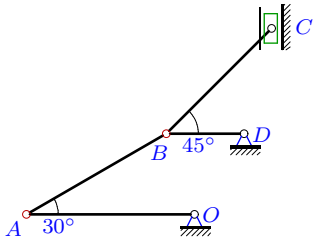
$\omega_{DB} = 4$ рад/с,
$OA = 27$ см,
$DB = 14$ см,
$AB = 40$ см,
$BC = 32$ см.

Задача 7.27. 9



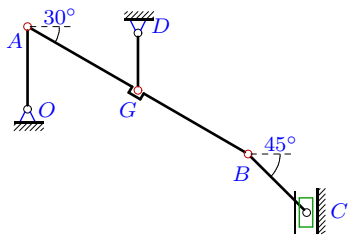
$\omega_{DB} = 7$ рад/с,
$OA = 28$ см,
$DB = 18$ см,
$AB = 30$ см,
$BC = 32$ см.

Задача 7.28. 9



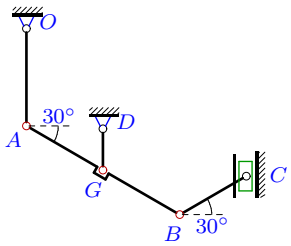
$\omega_{OA} = 5$ рад/с,
$OA = 26$ см,
$DB = 12$ см,
$AB = 25$ см,
$BC = 23$ см.

Задача 7.29. 9



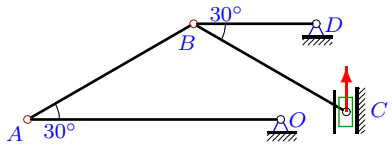
$\omega_{DG} = 6$ рад/с,
$OA = 26$ см,
$BG = 40$ см,
$DG = 18$ см,
$AG = 40$ см,
$BC = 26$ см.

Задача 7.30. 9



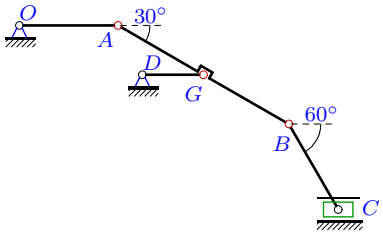
$\omega_{OA} = 6$ рад/с,
$OA = 33$ см,
$BG = 30$ см,
$DG = 14$ см,
$AG = 30$ см,
$BC = 26$ см.

Задача 7.31. 9



$v_c = 20$ см/с,
$OA = 33$ см,
$DB = 16$ см,
$AB = 25$ см,
$BC = 23$ см.

Задача 7.32. 9



$\omega_{OA} = 3$ рад/с,
$OA = 29$ см,
$BG = 29$ см,
$DG = 18$ см,
$AG = 29$ см,
$BC = 29$ см.

7.9

Кинематический анализ механизма (4 звена)

n	v_A	v_B	v_C	v_G	a_A	a_B	a_C	a_G
1	0.990	0.990	0.990	0.990	2.970	22.423	5.144	12.155
2	1.200	0.693	0.400*	–	9.550	2.738	0.000	–
3	0.960	0.960	0.960	–	2.880	7.553	10.286	–
4	0.050	0.050	0.050*	–	0.036	0.022	0.000	–
5	0.300	0.300	0.300*	–	0.334	0.707	0.000	–
6	1.080	1.080	1.080	–	10.303	9.720	4.624	–
7	3.493	12.594	17.465	6.050	141.331	199.901	4161.449	30.250
8	0.647	2.331	4.526	1.120	3.742	12.312	148.146	7.840
9	0.058	0.100	0.100*	–	0.055	0.014	0.000	–
10	0.050	0.050	0.050*	–	0.011	0.020	0.000	–
11	0.140	0.140	0.140	0.140	0.138	0.368	0.722	0.140
12	0.700	0.700	0.700	0.700	3.635	9.413	6.663	3.500
13	0.290	0.502	0.870	–	0.290	2.531	12.814	–
14	1.960	1.960	1.132	1.960	13.720	54.561	56.594	33.711
15	2.240	2.240	2.240	–	17.920	99.774	113.807	–
16	0.980	0.980	0.566	0.980	4.862	11.137	6.944	6.860
17	1.040	1.040	1.040	–	4.160	8.123	11.263	–
18	0.580	2.091	4.060	1.005	1.160	14.492	88.628	7.820
19	1.080	1.080	1.080	1.080	4.618	9.737	6.480	6.480
20	0.350	0.350	0.350*	–	1.337	1.010	0.000	–
21	0.029	0.050	0.050*	–	0.022	0.031	0.000	–
22	0.083	0.144	0.250*	–	0.275	0.342	0.000	–
23	3.720	8.318	9.588	3.720	121.070	81.589	115.860	22.320
24	0.960	0.960	0.960	–	5.849	5.760	9.977	–
25	1.080	1.080	1.080	1.080	7.586	18.371	11.045	6.480
26	0.560	0.560	0.560	–	1.318	2.240	2.240	–
27	1.260	1.260	0.727	–	10.106	8.820	1.182	–
28	1.300	1.300	1.300	–	6.500	19.258	0.949	–
29	1.080	1.080	1.080	1.080	7.760	18.559	23.804	6.480
30	1.980	1.980	3.429	1.980	11.880	47.892	44.256	29.509
31	0.200	0.200	0.200*	–	0.667	0.500	0.000	–
32	0.870	0.870	1.507	0.870	2.610	8.011	17.110	5.031

№	ω_{OA}	ω_{DB}	ω_{DG}	ω_{AB}	ω_{BC}	ε_{AB}	ε_{BC}
1	3.000	–	8.250	0.000	-0.000	-41.580	116.217
2	-4.286	3.849	–	-5.543	2.500	7.115	5.841
3	3.000	6.857	–	0.000	0.000	-16.364	-32.102
4	-0.156	0.417	–	0.000	0.272	0.101	-0.039
5	1.111	-1.667	–	0.000	0.000	-3.208	2.210
6	4.000	9.000	–	0.000	6.641	-43.200	44.098
7	-12.045	–	5.000	17.465	-83.448	297.555	11771.184
8	2.230	–	7.000	3.495	-15.448	2.554	-403.409
9	-0.206	-0.123	–	0.289	0.000	0.062	0.062
10	-0.156	-0.278	–	0.000	0.000	0.034	-0.085
11	-0.483	–	1.000	0.000	0.000	0.599	-2.674
12	-2.692	–	5.000	0.000	3.807	15.544	2.413
13	1.000	0.620	–	-1.450	4.368	-5.199	54.882
14	7.000	–	16.333	0.000	-7.073	-52.808	47.343
15	8.000	-16.000	–	0.000	0.000	384.000	179.932
16	3.267	–	7.000	0.000	4.352	17.247	5.312
17	4.000	6.500	–	0.000	0.000	-20.800	-41.566
18	2.000	–	-1.046	-3.625	13.856	16.190	233.668
19	3.375	–	6.000	0.000	0.000	16.037	-57.276
20	1.250	2.500	–	0.000	0.000	-3.125	-3.484
21	0.087	0.313	–	0.156	0.000	-0.078	0.108
22	-0.287	0.119	–	0.417	-0.995	1.156	-0.641
23	12.400	–	6.000	-5.845	-6.225	-106.652	-134.997
24	2.909	6.000	–	0.000	-0.000	17.983	39.724
25	-4.000	–	6.000	0.000	0.000	-41.569	76.368
26	2.074	4.000	–	0.000	0.000	-3.113	9.899
27	-4.500	7.000	–	0.000	4.547	-55.772	11.935
28	5.000	10.833	–	0.000	-0.000	-60.667	86.595
29	-4.154	–	6.000	0.000	-5.874	31.657	0.071
30	6.000	–	14.143	0.000	15.231	62.057	-258.587
31	-0.606	-1.250	–	0.000	0.000	-1.030	-2.174
32	3.000	–	4.833	0.000	-6.000	-11.000	-24.249