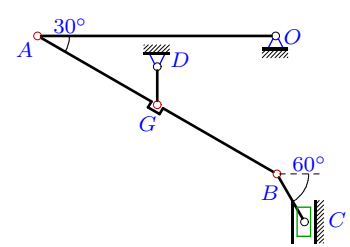
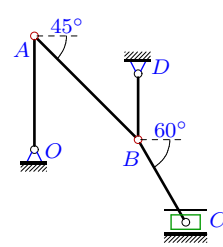
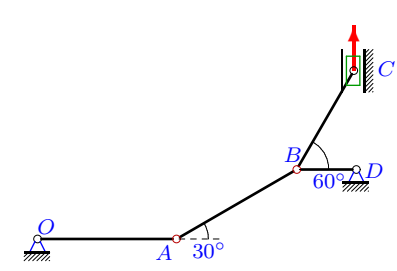
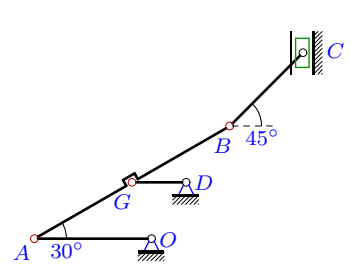
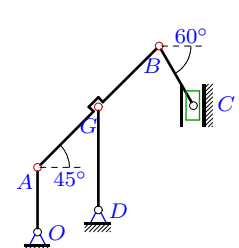
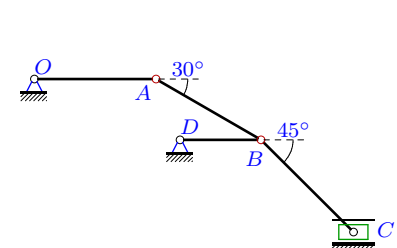
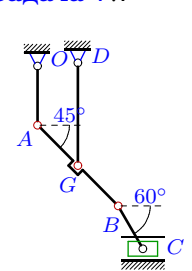
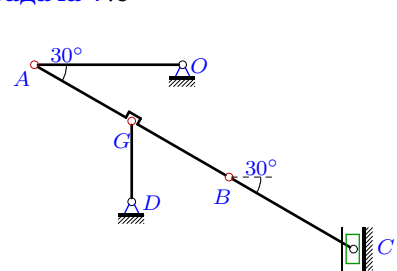
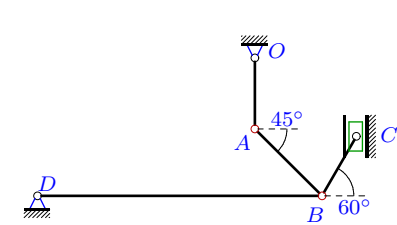
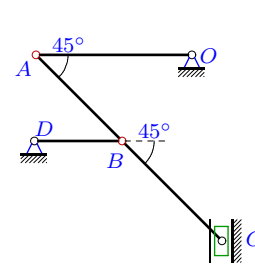


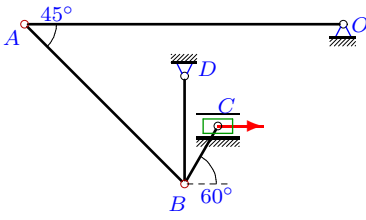
# Кинематический анализ механизма (4звена)

Найти скорости и ускорения шарниров плоского механизма.

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

<p><b>Задача 7.1</b></p>  <p style="text-align: right;"> <math>\omega_{OA} = 4 \text{ рад/с,}</math>  <math>OA = 112 \text{ см,}</math>  <math>BG = 65 \text{ см,}</math>  <math>DG = 18 \text{ см,}</math>  <math>AG = 65 \text{ см,}</math>  <math>BC = 26 \text{ см.}</math> </p> <p style="font-size: small;">7.5</p>	<p><b>Задача 7.2</b></p>  <p style="text-align: right;"> <math>\omega_{DB} = 25 \text{ рад/с,}</math>  <math>OA = 31 \text{ см,}</math>  <math>DB = 18 \text{ см,}</math>  <math>AB = 40 \text{ см,}</math>  <math>BC = 26 \text{ см.}</math> </p> <p style="font-size: small;">7.5</p>
<p><b>Задача 7.3</b></p>  <p style="text-align: right;"> <math>v_C = 80 \text{ см/с,}</math>  <math>OA = 28 \text{ см,}</math>  <math>DB = 12 \text{ см,}</math>  <math>AB = 28 \text{ см,}</math>  <math>BC = 23 \text{ см.}</math> </p> <p style="font-size: small;">7.5</p>	<p><b>Задача 7.4</b></p>  <p style="text-align: right;"> <math>\omega_{DG} = 32 \text{ рад/с,}</math>  <math>OA = 26 \text{ см,}</math>  <math>BG = 25 \text{ см,}</math>  <math>DG = 12 \text{ см,}</math>  <math>AG = 25 \text{ см,}</math>  <math>BC = 23 \text{ см.}</math> </p> <p style="font-size: small;">7.5</p>
<p><b>Задача 7.5</b></p>  <p style="text-align: right;"> <math>\omega_{OA} = 14 \text{ рад/с,}</math>  <math>OA = 30 \text{ см,}</math>  <math>BG = 40 \text{ см,}</math>  <math>DG = 48 \text{ см,}</math>  <math>AG = 40 \text{ см,}</math>  <math>BC = 32 \text{ см.}</math> </p> <p style="font-size: small;">7.5</p>	<p><b>Задача 7.6</b></p>  <p style="text-align: right;"> <math>\omega_{DB} = 14 \text{ рад/с,}</math>  <math>OA = 27 \text{ см,}</math>  <math>DB = 18 \text{ см,}</math>  <math>AB = 27 \text{ см,}</math>  <math>BC = 29 \text{ см.}</math> </p> <p style="font-size: small;">7.5</p>
<p><b>Задача 7.7</b></p>  <p style="text-align: right;"> <math>\omega_{DG} = 23 \text{ рад/с,}</math>  <math>OA = 31 \text{ см,}</math>  <math>BG = 30 \text{ см,}</math>  <math>DG = 54 \text{ см,}</math>  <math>AG = 30 \text{ см,}</math>  <math>BC = 26 \text{ см.}</math> </p> <p style="font-size: small;">7.5</p>	<p><b>Задача 7.8</b></p>  <p style="text-align: right;"> <math>\omega_{DG} = 31 \text{ рад/с,}</math>  <math>OA = 33 \text{ см,}</math>  <math>BG = 25 \text{ см,}</math>  <math>DG = 18 \text{ см,}</math>  <math>AG = 25 \text{ см,}</math>  <math>BC = 32 \text{ см.}</math> </p> <p style="font-size: small;">7.5</p>
<p><b>Задача 7.9</b></p>  <p style="text-align: right;"> <math>\omega_{DB} = 4 \text{ рад/с,}</math>  <math>OA = 30 \text{ см,}</math>  <math>DB = 120 \text{ см,}</math>  <math>AB = 40 \text{ см,}</math>  <math>BC = 29 \text{ см.}</math> </p> <p style="font-size: small;">7.5</p>	<p><b>Задача 7.10</b></p>  <p style="text-align: right;"> <math>\omega_{OA} = 25 \text{ рад/с,}</math>  <math>OA = 32 \text{ см,}</math>  <math>DB = 18 \text{ см,}</math>  <math>AB = 25 \text{ см,}</math>  <math>BC = 29 \text{ см.}</math> </p> <p style="font-size: small;">7.5</p>

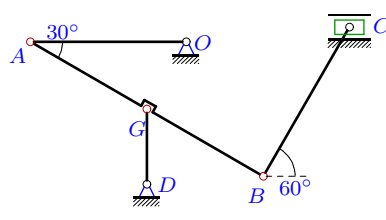
**Задача 7.11**



$v_C = 25 \text{ см/с},$   
 $OA = 124 \text{ см},$   
 $DB = 42 \text{ см},$   
 $AB = 88 \text{ см},$   
 $BC = 26 \text{ см}.$

7.5

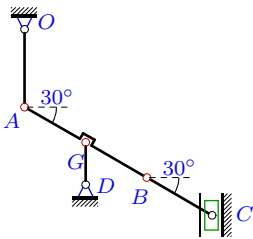
**Задача 7.12**



$\omega_{OA} = 9 \text{ рад/с},$   
 $OA = 29 \text{ см},$   
 $BG = 25 \text{ см},$   
 $DG = 14 \text{ см},$   
 $AG = 25 \text{ см},$   
 $BC = 32 \text{ см}.$

7.5

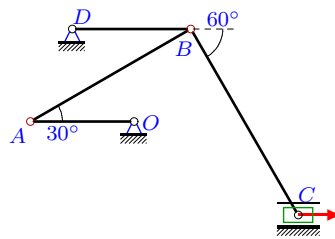
**Задача 7.13**



$\omega_{OA} = 4 \text{ рад/с},$   
 $OA = 33 \text{ см},$   
 $BG = 30 \text{ см},$   
 $DG = 18 \text{ см},$   
 $AG = 30 \text{ см},$   
 $BC = 32 \text{ см}.$

7.5

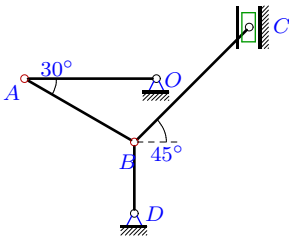
**Задача 7.14**



$v_C = 55 \text{ см/с},$   
 $OA = 14 \text{ см},$   
 $DB = 16 \text{ см},$   
 $AB = 25 \text{ см},$   
 $BC = 29 \text{ см}.$

7.5

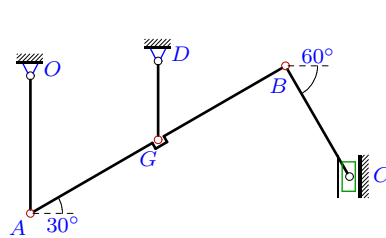
**Задача 7.15**



$\omega_{OA} = 4 \text{ рад/с},$   
 $OA = 26 \text{ см},$   
 $DB = 14 \text{ см},$   
 $AB = 25 \text{ см},$   
 $BC = 32 \text{ см}.$

7.5

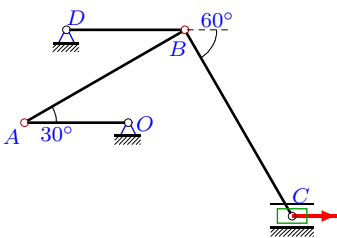
**Задача 7.16**



$\omega_{DG} = 11 \text{ рад/с},$   
 $OA = 28 \text{ см},$   
 $BG = 30 \text{ см},$   
 $DG = 16 \text{ см},$   
 $AG = 30 \text{ см},$   
 $BC = 26 \text{ см}.$

7.5

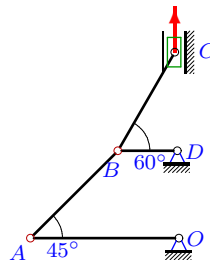
**Задача 7.17**



$v_C = 50 \text{ см/с},$   
 $OA = 14 \text{ см},$   
 $DB = 16 \text{ см},$   
 $AB = 25 \text{ см},$   
 $BC = 29 \text{ см}.$

7.5

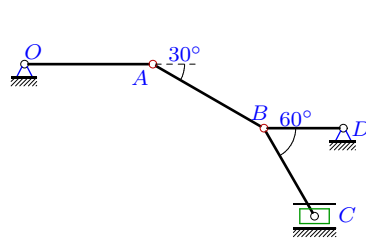
**Задача 7.18**



$v_C = 65 \text{ см/с},$   
 $OA = 30 \text{ см},$   
 $DB = 12 \text{ см},$   
 $AB = 25 \text{ см},$   
 $BC = 23 \text{ см}.$

7.5

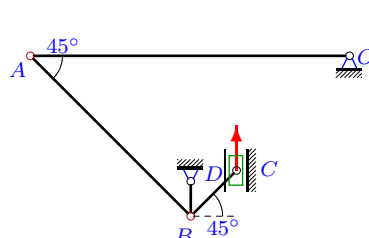
**Задача 7.19**



$\omega_{OA} = 15 \text{ рад/с},$   
 $OA = 29 \text{ см},$   
 $DB = 18 \text{ см},$   
 $AB = 29 \text{ см},$   
 $BC = 23 \text{ см}.$

7.5

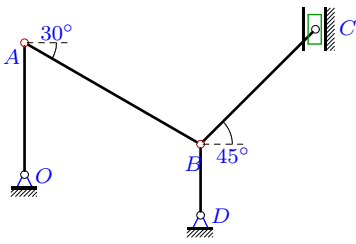
**Задача 7.20**



$v_C = 75 \text{ см/с},$   
 $OA = 128 \text{ см},$   
 $DB = 14 \text{ см},$   
 $AB = 91 \text{ см},$   
 $BC = 26 \text{ см}.$

7.5

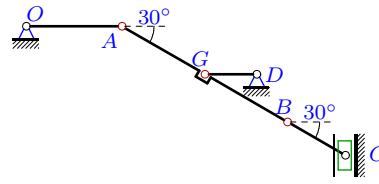
**Задача 7.21**



$\omega_{DB} = 5$  рад/с,  
 $OA = 26$  см,  
 $DB = 14$  см,  
 $AB = 40$  см,  
 $BC = 32$  см.

7.5

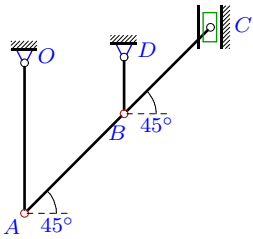
**Задача 7.22**



$\omega_{OA} = 22$  рад/с,  
 $OA = 33$  см,  
 $BG = 33$  см,  
 $DG = 18$  см,  
 $AG = 33$  см,  
 $BC = 23$  см.

7.5

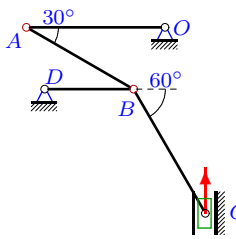
**Задача 7.23**



$\omega_{OA} = 29$  рад/с,  
 $OA = 32$  см,  
 $DB = 12$  см,  
 $AB = 30$  см,  
 $BC = 26$  см.

7.5

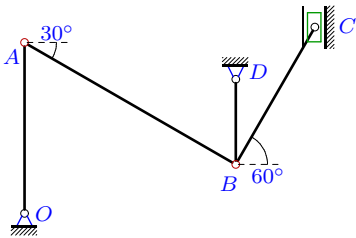
**Задача 7.24**



$v_C = 30$  см/с,  
 $OA = 28$  см,  
 $DB = 18$  см,  
 $AB = 25$  см,  
 $BC = 29$  см.

7.5

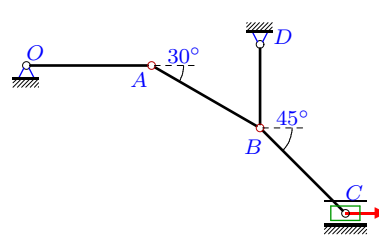
**Задача 7.25**



$\omega_{OA} = 26$  рад/с,  
 $OA = 28$  см,  
 $DB = 14$  см,  
 $AB = 40$  см,  
 $BC = 26$  см.

7.5

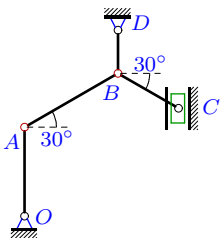
**Задача 7.26**



$v_C = 5$  см/с,  
 $OA = 27$  см,  
 $DB = 18$  см,  
 $AB = 27$  см,  
 $BC = 26$  см.

7.5

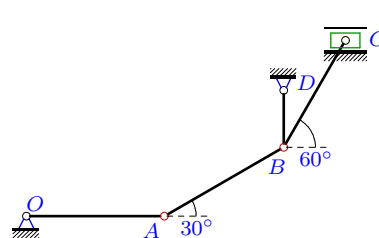
**Задача 7.27**



$\omega_{OA} = 20$  рад/с,  
 $OA = 33$  см,  
 $DB = 16$  см,  
 $AB = 40$  см,  
 $BC = 26$  см.

7.5

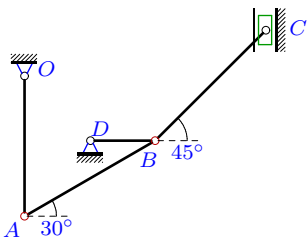
**Задача 7.28**



$\omega_{DB} = 13$  рад/с,  
 $OA = 29$  см,  
 $DB = 12$  см,  
 $AB = 29$  см,  
 $BC = 26$  см.

7.5

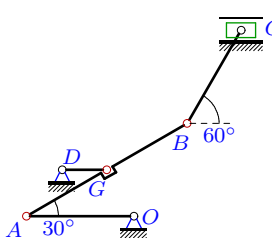
**Задача 7.29**



$\omega_{DB} = 6$  рад/с,  
 $OA = 26$  см,  
 $DB = 12$  см,  
 $AB = 28$  см,  
 $BC = 29$  см.

7.5

**Задача 7.30**



$\omega_{DG} = 17$  рад/с,  
 $OA = 29$  см,  
 $BG = 25$  см,  
 $DG = 12$  см,  
 $AG = 25$  см,  
 $BC = 29$  см.

7.5

**Кинематический анализ механизма (4звена)**

п	$v_A$	$v_B$	$v_C$	$v_G$	$a_A$	$a_B$	$a_C$	$a_G$
1	4.480	6.843	1.493	2.587	17.920	81.842	252.567	38.053
2	4.500	4.500	4.500	–	189.441	112.500	194.856	–
3	0.800	0.800	0.800	–	10.372	6.158	0.000	–
4	3.840	3.840	3.840	3.840	127.868	221.071	74.443	122.880
5	4.200	4.200	2.425	4.200	58.800	46.485	95.632	42.857
6	2.520	2.520	2.520	–	31.114	35.280	97.217	–
7	12.420	12.420	12.420	12.420	540.857	224.396	339.626	285.660
8	9.665	14.763	9.665	5.580	735.706	437.135	3937.025	172.980
9	4.800	4.800	4.800	–	233.508	19.200	11.085	–
10	8.000	8.000	8.000	–	200.000	659.592	200.000	–
11	0.250	0.250	0.250	–	0.261	0.298	0.000	–
12	2.610	3.987	7.534	1.507	23.490	85.532	305.629	32.208
13	1.320	1.320	2.286	1.320	5.280	30.092	48.840	12.973
14	0.318	0.318	0.550	–	4.369	2.068	0.000	–
15	1.040	0.600	0.600	–	4.160	4.747	9.750	–
16	1.760	1.760	1.016	1.760	12.055	28.069	48.765	19.360
17	0.289	0.289	0.500	–	3.610	1.709	0.000	–
18	0.650	0.650	0.650	–	1.411	4.066	0.000	–
19	4.350	4.350	7.534	–	65.250	313.264	1064.174	–
20	0.750	0.750	0.750	–	0.750	4.534	0.000	–
21	0.700	0.700	0.700	–	2.103	3.500	7.831	–
22	7.260	7.260	7.260	7.260	159.720	1735.820	276.643	836.732
23	9.280	9.280	9.280	–	269.120	846.291	667.725	–
24	0.300	0.300	0.300	–	1.179	0.577	0.000	–
25	7.280	7.280	4.203	–	189.280	500.788	254.008	–
26	0.087	0.050	0.050	–	0.135	0.020	0.000	–
27	6.600	6.600	11.432	–	132.000	358.598	2016.808	–
28	2.702	1.560	1.560	–	133.415	20.280	35.126	–
29	0.416	0.720	0.720	–	1.969	4.320	4.320	–
30	2.040	2.040	3.533	2.040	86.127	119.245	51.422	34.680

№	$\omega_{OA}$	$\omega_{DB}$	$\omega_{DG}$	$\omega_{AB}$	$\omega_{BC}$	$\varepsilon_{AB}$	$\varepsilon_{BC}$
1	4.000	-	14.370	7.959	-22.974	29.458	456.807
2	-14.516	25.000	-	0.000	0.000	628.698	-865.385
3	2.857	-6.667	-	0.000	0.000	-54.422	26.776
4	14.769	-	32.000	0.000	0.000	-529.329	1162.398
5	14.000	-	8.750	0.000	15.155	77.959	291.742
6	9.333	14.000	-	0.000	-12.289	-87.111	-151.020
7	40.065	-	23.000	0.000	0.000	-999.101	-567.067
8	-29.287	-	31.000	-44.640	69.750	1187.043	10195.649
9	-16.000	4.000	-	16.971	-0.000	-559.529	-76.449
10	25.000	-44.444	-	0.000	-0.000	-3142.697	1733.902
11	0.202	0.595	-	0.402	0.000	-0.334	-1.145
12	9.000	-	-10.763	12.055	-16.313	-158.817	663.636
13	4.000	-	-7.333	0.000	-8.250	-57.581	225.852
14	2.268	-1.985	-	0.000	2.190	10.804	5.278
15	4.000	-4.289	-	4.804	2.654	-25.216	-24.665
16	6.286	-	11.000	0.000	-7.816	31.936	56.549
17	2.062	-1.804	-	-0.000	1.991	8.929	4.362
18	-2.167	-5.417	-	0.000	0.000	-11.950	17.676
19	15.000	-24.167	-	0.000	-37.826	1175.000	-5044.311
20	0.586	5.357	-	1.166	4.079	3.941	-5.212
21	2.692	5.000	-	0.000	-3.094	-4.663	-9.570
22	22.000	-	-40.333	0.000	0.000	2742.667	-6481.391
23	29.000	77.333	-	0.000	50.477	2114.406	-4987.581
24	-1.071	1.667	-	0.000	0.000	-6.571	1.991
25	26.000	-52.000	-	0.000	-32.332	1639.213	852.477
26	-0.321	0.278	-	0.370	0.000	0.546	-0.076
27	20.000	-41.250	-	0.000	50.769	1166.969	6259.724
28	9.317	13.000	-	-10.759	0.000	-374.103	-156.000
29	1.599	6.000	-	2.969	-0.000	2.349	-21.067
30	-7.034	-	17.000	0.000	-14.069	392.243	-242.841