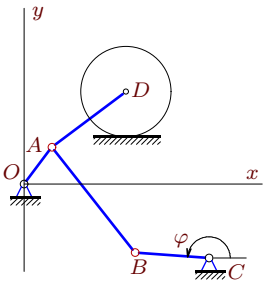
Кинематический анализ плоского механизма (2)

Механизм изображен в произвольном положении, определяемом некоторым углом φ. Задана угловая скорость одного из звеньев или скорость центра диска. Длины звеньев даны в сантиметрах, радиус диска равен 5 см. Заданы координаты шарнира C и ордината оси диска в осях с началом в шарнире O. Диск катится без проскальзывания. Найти угловые скорости всех звеньев механизма и скорость центра диска (если она не задана) при $\varphi = \varphi_0$.

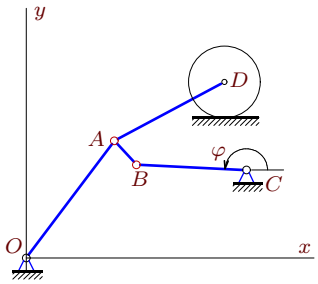
Кирсанов М.Н. **Решебник. Теоретическая механика**/Под ред. А. И. Кириллова.– М.: ФИЗМАТЛИТ, 2008. — 384 с. (с.158.)

Задача 27.1.



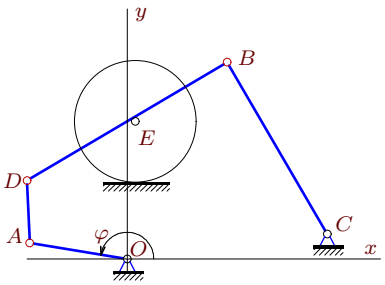
$\omega_{OA_z} = 24$ рад/с, $OA = 5$, $AB = 15$, $BC = 8$, $AD = 10$, $x_C = 20$, $y_C = -8$, $y_D = 10$, $\varphi_0 = \pi$.

Задача 27.2.



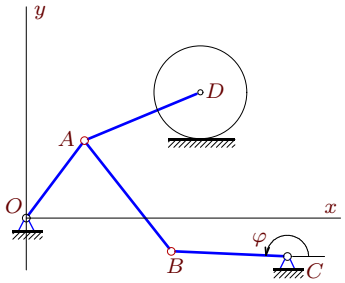
$\omega_{BC_z} = -8$ рад/с, $OA = 20$, $AB = 5$, $BC = 15$, $AD = 17$, $x_C = 30$, $y_C = 12$, $y_D = 24$, $\varphi_0 = \pi$.

Задача 27.3.



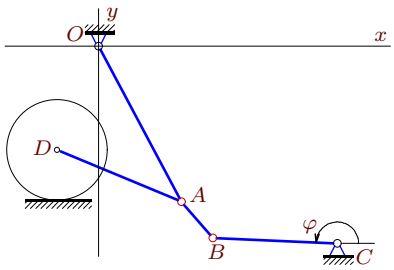
$v_{Ex} = -105$ см/с, BC=17, $DE = BE = 10$, $OA = 8$, $AD = 5$, $x_C = 16$, $y_C = 2$, $y_E = 11$, $\varphi_0 = \pi$.

Задача 27.4.



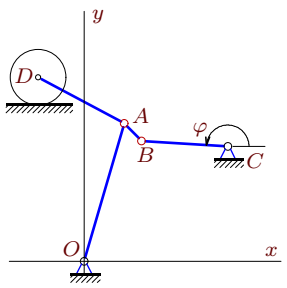
$\omega_{OA_z} = 6$ рад/с, $OA = 10$, $AB = 15$, $BC = 12$, $AD = 13$, $x_C = 27$, $y_C = -4$, $y_D = 13$, $\varphi_0 = \pi$.

Задача 27.5.



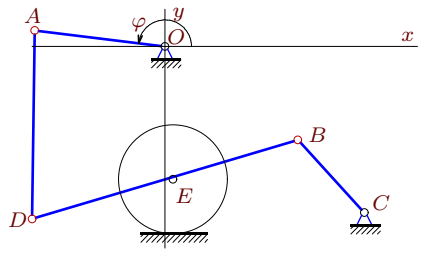
$\omega_{BC_z} = -13$ рад/с, $OA = 17$, $AB = 5$, $BC = 12$, $AD = 13$, $x_C = 23$, $y_C = -19$, $y_D = -10$, $\varphi_0 = \pi$.

Задача 27.6.



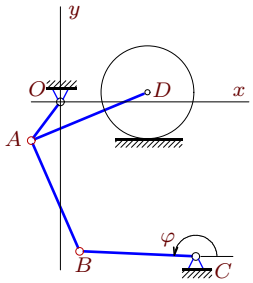
$v_{Dx} = -416$ см/с, $OA = 25$, $AB = 5$, $BC = 15$, $AD = 17$, $x_C = 25$, $y_C = 20$, $y_D = 32$, $\varphi_0 = \pi$.

Задача 27.7.



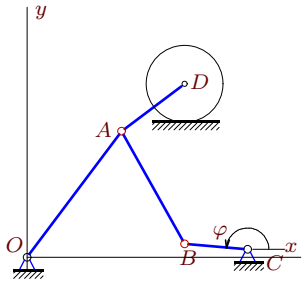
$\omega_{BC_z} = 34$ рад/с, BC=10, $DE = BE = 13$, $OA = 12$, $AD = 17$, $x_C = 18$, $y_C = -15$, $y_E = -12$, $\varphi_0 = \pi$.

Задача 27.8.



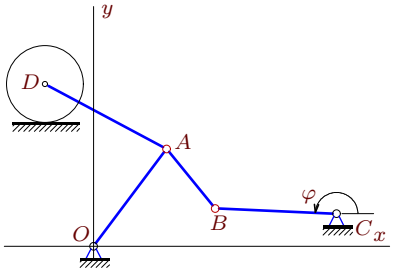
$\omega_{BC_z} = 14$ рад/с, $OA = 5$, $AB = 13$, $BC = 12$, $AD = 13$, $x_C = 14$, $y_C = -16$, $y_D = 1$, $\varphi_0 = \pi$.

Задача 27.9.



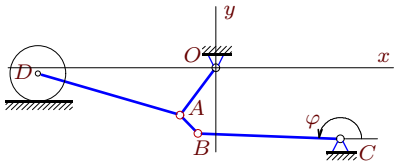
$v_{Dx} = 210$ см/с, $OA = 20$, $AB = 17$, $BC = 8$, $AD = 10$, $x_C = 28$, $y_C = 1$, $y_D = 22$, $\varphi_0 = \pi$.

Задача 27.10.



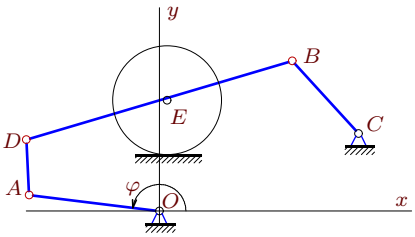
$\omega_{OA_z} = -10$ рад/с, $OA = 15$, $AB = 10$, $BC = 15$, $AD = 17$, $x_C = 30$, $y_C = 4$, $y_D = 20$, $\varphi_0 = \pi$.

Задача 27.11.



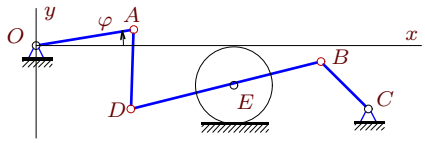
$\omega_{BC_z} = -2$ рад/с, $OA = 10$, $AB = 5$, $BC = 24$, $AD = 25$, $x_C = 21$, $y_C = -12$, $y_D = -1$, $\varphi_0 = \pi$.

Задача 27.12.



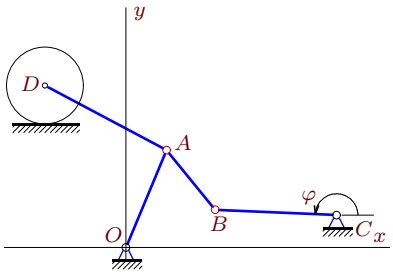
$v_{Ex} = -105$ см/с, BC=10, $DE = BE = 13$, $OA = 12$, $AD = 5$, $x_C = 18$, $y_C = 7$, $y_E = 10$, $\varphi_0 = \pi$.

Задача 27.13.



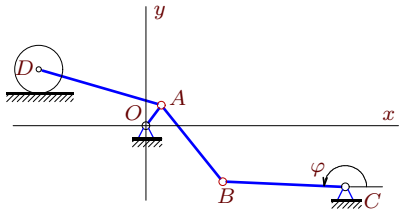
$\omega_{OA_z} = 5$ рад/с, BC=10, $DE = BE = 13$, $OA = 12$, $AD = 10$, $x_C = 42$, $y_C = -8$, $y_E = -5$, $\varphi_0 = 0$.

Задача 27.14.



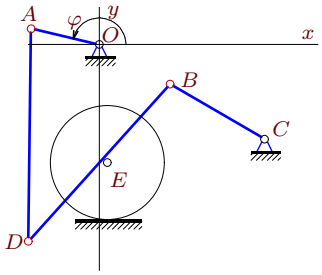
$\omega_{BC_z} = 28$ рад/с, $OA = 13$, $AB = 10$, $BC = 15$, $AD = 17$, $x_C = 26$, $y_C = 4$, $y_D = 20$, $\varphi_0 = \pi$.

Задача 27.15.



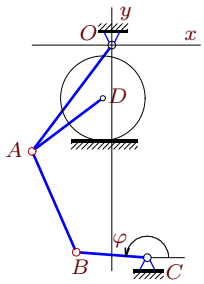
$v_{Dx} = -39$ см/с, $OA = 5$, $AB = 20$, $BC = 24$, $AD = 25$, $x_C = 39$, $y_C = -12$, $y_D = 11$, $\varphi_0 = \pi$.

Задача 27.16.



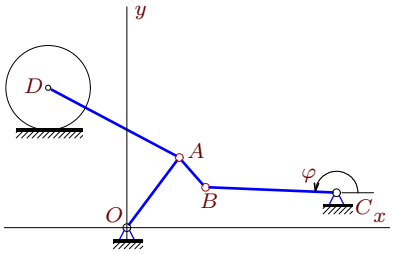
$\omega_{BC_z} = 27$ рад/с, BC=10, $DE = BE = 10$, $OA = 6$, $AD = 18$, $x_C = 14$, $y_C = -8$, $y_E = -10$, $\varphi_0 = \pi$.

Задача 27.17.



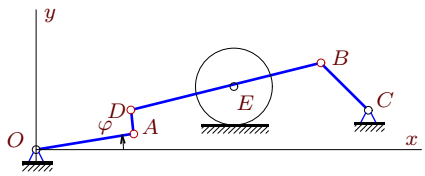
$\omega_{BC_z} = 14$ рад/с, $OA = 15$, $AB = 13$, $BC = 8$, $AD = 10$, $x_C = 4$, $y_C = -24$, $y_D = -6$, $\varphi_0 = \pi$.

Задача 27.18.



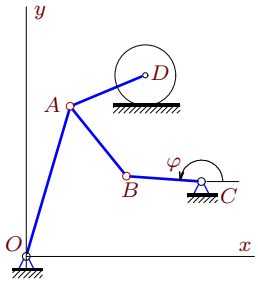
$v_{Dx} = -56$ см/с, $OA = 10$, $AB = 5$, $BC = 15$, $AD = 17$, $x_C = 24$, $y_C = 4$, $y_D = 16$, $\varphi_0 = \pi$.

Задача 27.19.



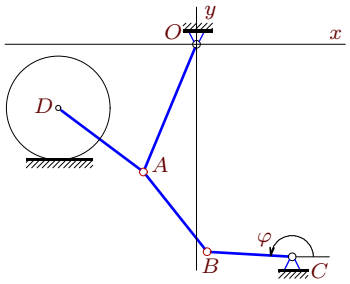
$\omega_{OA_z} = 3$ рад/с, BC=10, $DE = BE = 13$, $OA = 12$, $AD = 3$, $x_C = 42$, $y_C = 5$, $y_E = 8$, $\varphi_0 = 0$.

Задача 27.20.



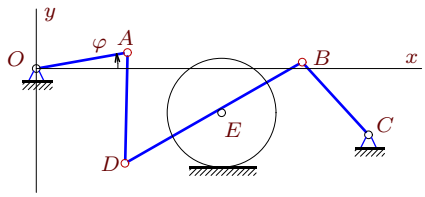
$\omega_{BC_z} = -25$ рад/с, $OA = 25$, $AB = 15$, $BC = 12$, $AD = 13$, $x_C = 28$, $y_C = 12$, $y_D = 29$, $\varphi_0 = \pi$.

Задача 27.21.



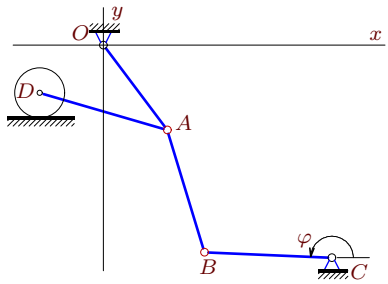
$v_{Dx} = 126$ см/с, $OA = 13$, $AB = 10$, $BC = 8$, $AD = 10$, $x_C = 9$, $y_C = -20$, $y_D = -6$, $\varphi_0 = \pi$.

Задача 27.22.



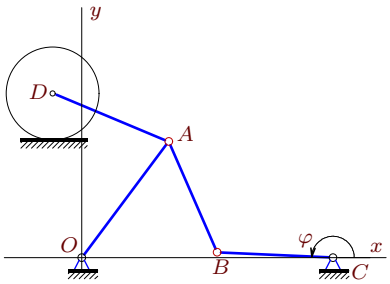
$\omega_{BC_z} = 20$ рад/с, BC=10, $DE = BE = 10$, $OA = 8$, $AD = 10$, $x_C = 30$, $y_C = -6$, $y_E = -4$, $\varphi_0 = 0$.

Задача 27.23.



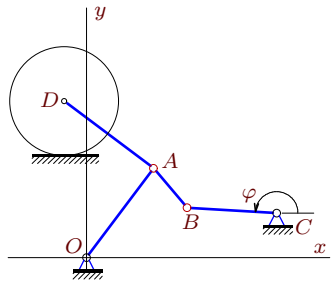
$\omega_{BC_z} = 11$ рад/с, $OA = 20$, $AB = 25$, $BC = 24$, $AD = 25$, $x_C = 43$, $y_C = -40$, $y_D = -9$, $\varphi_0 = \pi$.

Задача 27.24.



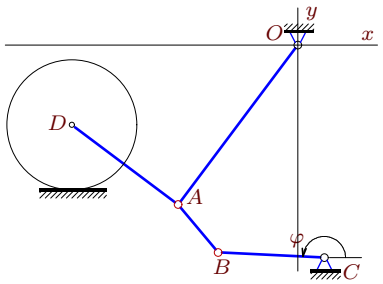
$v_{Dx} = -189$ см/с, $OA = 15$, $AB = 13$, $BC = 12$, $AD = 13$, $x_C = 26$, $y_C = 0$, $y_D = 17$, $\varphi_0 = \pi$.

Задача 27.25.



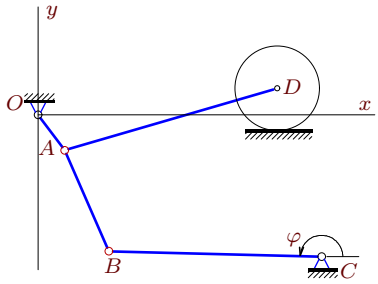
$\omega_{OA_z} = -4$ рад/с, $OA = 10$, $AB = 5$, $BC = 8$, $AD = 10$, $x_C = 17$, $y_C = 4$, $y_D = 14$, $\varphi_0 = \pi$.

Задача 27.26.



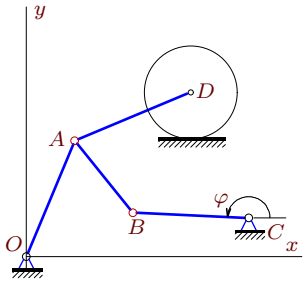
$\omega_{BC_z} = -18$ рад/с, $OA = 15$, $AB = 5$, $BC = 8$, $AD = 10$, $x_C = 2$, $y_C = -16$, $y_D = -6$, $\varphi_0 = \pi$.

Задача 27.27.



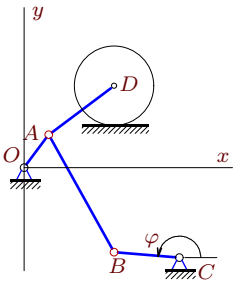
$v_{Dx} = -351$ см/с, $OA = 5$, $AB = 13$, $BC = 24$, $AD = 25$, $x_C = 32$, $y_C = -16$, $y_D = 3$, $\varphi_0 = \pi$.

Задача 27.28.



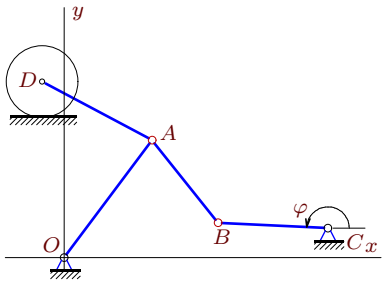
$\omega_{OA_z} = 12$ рад/с, $OA = 13$, $AB = 10$, $BC = 12$, $AD = 13$, $x_C = 23$, $y_C = 4$, $y_D = 17$, $\varphi_0 = \pi$.

Задача 27.29.



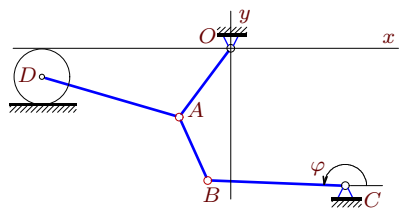
$\omega_{BC_z} = -77$ рад/с, $OA = 5$, $AB = 17$, $BC = 8$, $AD = 10$, $x_C = 19$, $y_C = -11$, $y_D = 10$, $\varphi_0 = \pi$.

Задача 27.30.



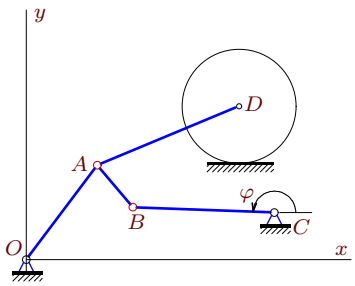
$v_{Dx} = -336$ см/с, $OA = 20$, $AB = 15$, $BC = 15$, $AD = 17$, $x_C = 36$, $y_C = 4$, $y_D = 24$, $\varphi_0 = \pi$.

Задача 27.31.



$\omega_{OA_z} = -24$ рад/с, $OA = 15$,
$AB = 13$, $BC = 24$, $AD = 25$,
$x_C = 20$, $y_C = -24$, $y_D = -5$,
$\varphi_0 = \pi$.

Задача 27.32.



$\omega_{BC_z} = -2$ рад/с, $OA = 10$,
$AB = 5$, $BC = 12$, $AD = 13$,
$x_C = 21$, $y_C = 4$, $y_D = 13$,
$\varphi_0 = \pi$.

27.1

Кинематический анализ плоского механизма (2)

№	ω_{OA_z}	ω_{AB_z}	ω_{BC_z}	ω_{AD_z}	ω_{BD_z}	v_{Dx}	v_{Ex}
1	–	8	−18	−9	–	42	–
2	5	20	–	−4	–	48	–
3	−5	–	5	27	−5	–	–
4	–	4	−6	−3	–	33	–
5	−48	180	–	−32	–	560	–
6	−15	−90	25	−7	–	–	–
7	−17	–	–	−26	−17	–	−357
8	36	−12	–	9	–	−99	–
9	30	32	−77	−45	–	–	–
10	–	−15	12	−6	–	−168	–
11	−4	8	–	1	–	39	–
12	−5	–	10	26	−5	–	–
13	–	–	10	−13	−5	–	−105
14	−30	−45	–	−10	–	−440	–
15	−8	−2	2	−1	–	–	–
16	−36	–	–	−41	−36	–	−450
17	8	−8	–	9	–	−42	–
18	−5	−10	4	−2	–	–	–
19	–	–	6	26	−3	–	−63
20	12	24	–	−7	–	253	–
21	−8	12	−14	5	–	–	–
22	15	–	–	−34	−15	–	−250
23	−36	24	–	−18	–	450	–
24	−12	−12	14	−9	–	–	–
25	–	−8	6	−3	–	−50	–
26	−8	24	–	9	–	150	–
27	72	−24	−4	−9	–	–	–
28	–	18	−14	−5	–	119	–
29	120	32	–	−45	–	210	–
30	−15	−20	24	−12	–	–	–
31	–	24	−14	9	–	351	–
32	2	4	–	−1	–	11	–