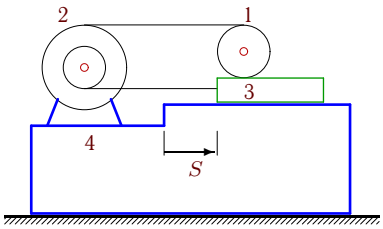
Теорема о центре масс системы

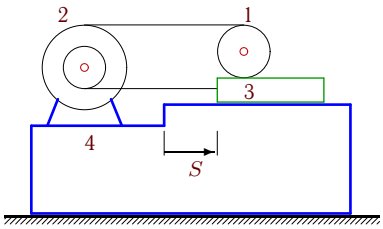
Механизм, состоящий из трех тел, установлен на призме, скользящей по гладкой плоскости. Нити, соединяющие тела, параллельны плоскостям. Под действием внутренних сил из состояния покоя механизм пришел в движение. Центр цилиндра (блока) или бруска сместился относительно призмы на расстояние S. Найти смещение призмы. Массы даны в килограммах, радиусы и смещение — в сантиметрах.

Задача D4.1.



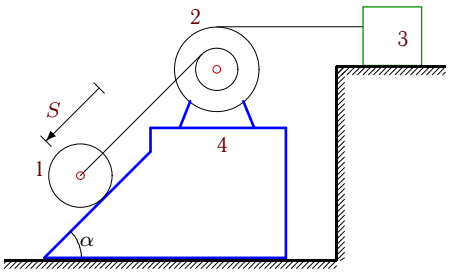
$R_2 = 5$, $r_2 = 3$, $m_1 = 6$, $m_2 = 12$, $m_3 = 12$, $m_4 = 15$, $S = 90$.

Задача D4.2.



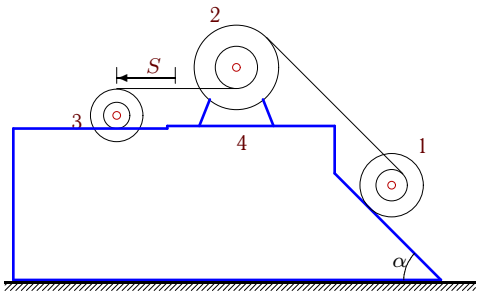
$R_2 = 5$, $r_2 = 3$, $m_1 = 6$, $m_2 = 15$, $m_3 = 15$, $m_4 = 15$, $S = 153$.

Задача D4.3.



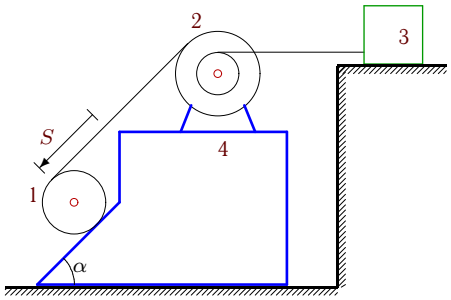
$R_2 = 4$, $r_2 = 2$, $m_1 = 10$, $m_2 = 15$, $m_3 = 1$, $m_4 = 15$, $S = 164$, $\cos\alpha = 0{,}6$.

Задача D4.4.



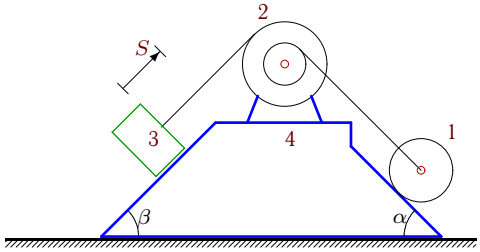
$R_1 = 4$, $r_1 = 2$, $R_2 = 5$, $r_2 = 3$, $R_3 = 4$, $r_3 = 3$, $m_1 = 27$, $m_2 = 15$, $m_3 = 12$, $m_4 = 15$, $S = 207$, $\cos\alpha = 0{,}8$.

Задача D4.5.



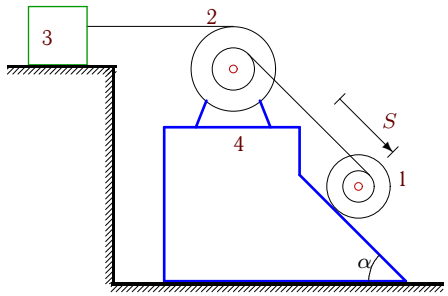
$R_2 = 3$, $r_2 = 2$, $m_1 = 4$, $m_2 = 15$, $m_3 = 3$, $m_4 = 13$, $S = 140$, $\alpha = \pi/3$.

Задача D4.6.



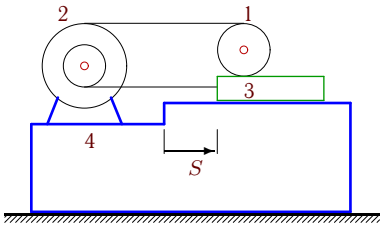
$R_2 = 4$, $r_2 = 2$, $m_1 = 10$, $m_2 = 15$, $m_3 = 6$, $m_4 = 12$, $S = 129$, $\cos\alpha = 0{,}8$, $\beta = \pi/3$.

Задача D4.7.



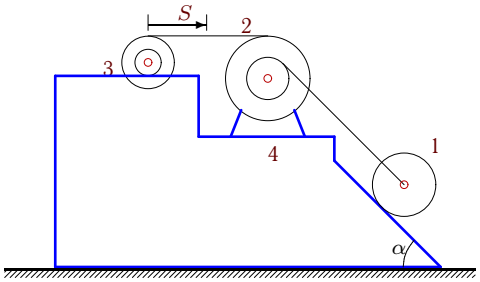
$R_1 = 4,\ r_1 = 3,\ R_2 = 4,\ r_2 = 3,\ m_1 = 5,\ m_2 = 10,\ m_3 = 3,\ m_4 = 10,\ S = 56,\ \cos\alpha = 0{,}8.$

Задача D4.8.



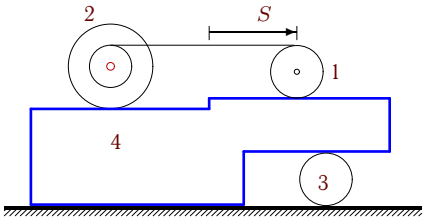
$R_2 = 5,\quad r_2 = 3,\quad m_1 = 6,\quad m_2 = 15,\quad m_3 = 12,\ m_4 = 12,\ S = 135.$

Задача D4.9.



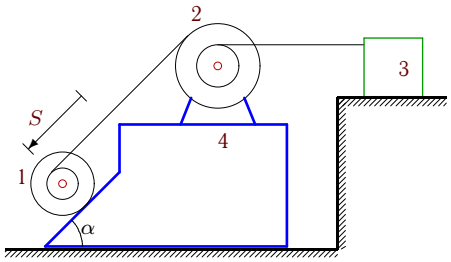
$R_2 = 5,\ r_2 = 3,\ R_3 = 4,\ r_3 = 3,\ m_1 = 25,\ m_2 = 15,\ m_3 = 15,\ m_4 = 12,\ S = 134,\ \cos\alpha = 0{,}8.$

Задача D4.10.



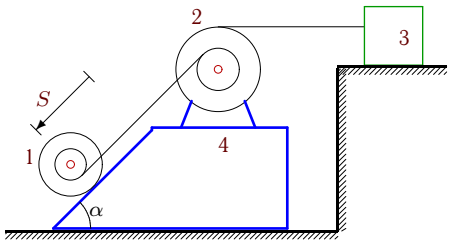
$R_2 = 5,\quad r_2 = 3,\quad m_1 = 15,\quad m_2 = 5,\quad m_3 = 30,\ m_4 = 13,\ S = 192.$

Задача D4.11.



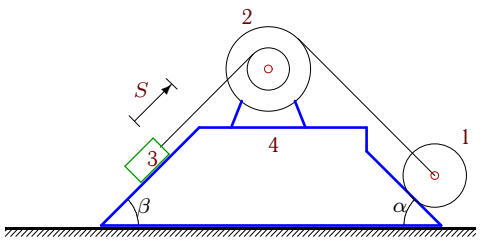
$R_1 = 4,\ r_1 = 2,\ R_2 = 4,\ r_2 = 2,\ m_1 = 4,\ m_2 = 15,\ m_3 = 8,\ m_4 = 12,\ S = 78,\ \alpha = \pi/3.$

Задача D4.12.



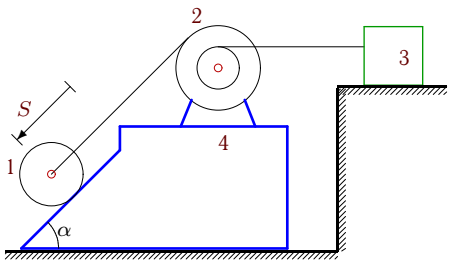
$R_1 = 4,\ r_1 = 2,\ R_2 = 5,\ r_2 = 3,\ m_1 = 4,\ m_2 = 15,\ m_3 = 6,\ m_4 = 12,\ S = 111,\ \alpha = \pi/3.$

Задача D4.13.



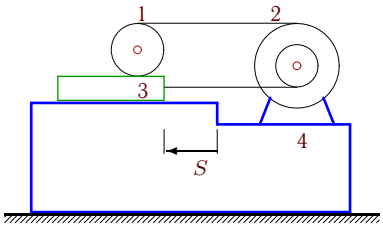
$R_2 = 4,\quad r_2 = 3,\quad m_1 = 30,\quad m_2 = 13,\quad m_3 = 6,\ m_4 = 10,\ S = 118,\ \cos\alpha = 0{,}8,\ \beta = \pi/3.$

Задача D4.14.



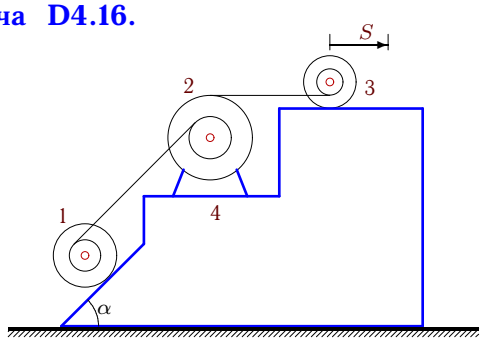
$R_2 = 4,\quad r_2 = 2,\quad m_1 = 10,\quad m_2 = 15,\quad m_3 = 2,\ m_4 = 12,\ S = 117,\ \cos\alpha = 0{,}6.$

Задача D4.15.



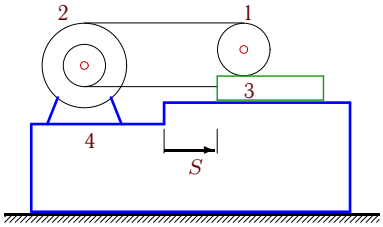
$R_2 = 3$, $r_2 = 2$, $m_1 = 4$, $m_2 = 15$, $m_3 = 13$, $m_4 = 10$, $S = 84$.

Задача D4.16.



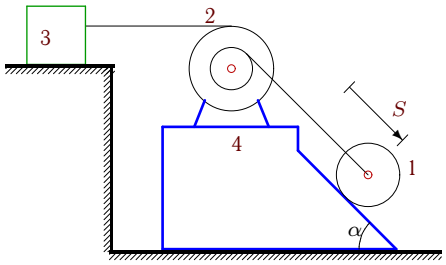
$R_1 = 4$, $r_1 = 3$, $R_2 = 5$, $r_2 = 3$, $R_3 = 5$, $r_3 = 3$, $m_1 = 875$, $m_2 = 10$, $m_3 = 12$, $m_4 = 15$, $S = 2736$, $\cos\alpha = 0{,}6$.

Задача D4.17.



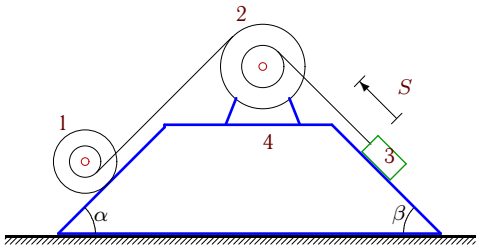
$R_2 = 4$, $r_2 = 2$, $m_1 = 4$, $m_2 = 10$, $m_3 = 10$, $m_4 = 12$, $S = 108$.

Задача D4.18.



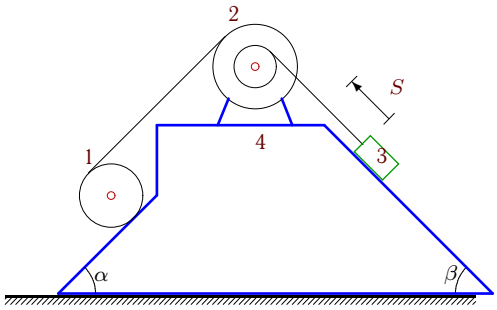
$R_2 = 4$, $r_2 = 3$, $m_1 = 5$, $m_2 = 12$, $m_3 = 6$, $m_4 = 10$, $S = 132$, $\cos\alpha = 0{,}8$.

Задача D4.19.



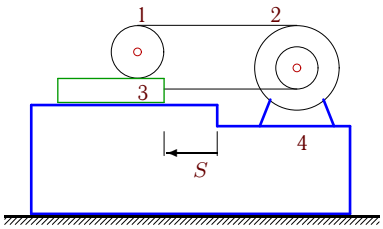
$R_1 = 5$, $r_1 = 3$, $R_2 = 5$, $r_2 = 3$, $m_1 = 2$, $m_2 = 12$, $m_3 = 10$, $m_4 = 12$, $S = 144$, $\cos\alpha = 0{,}6$, $\cos\beta = 0{,}8$.

Задача D4.20.



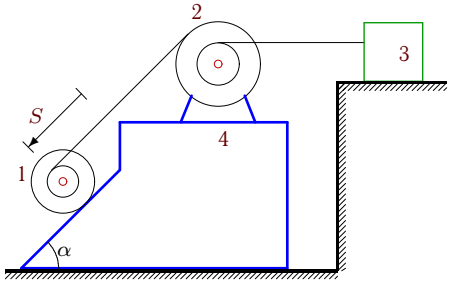
$R_2 = 5$, $r_2 = 3$, $m_1 = 4$, $m_2 = 15$, $m_3 = 20$, $m_4 = 15$, $S = 162$, $\cos\alpha = \cos\beta = 0{,}6$.

Задача D4.21.



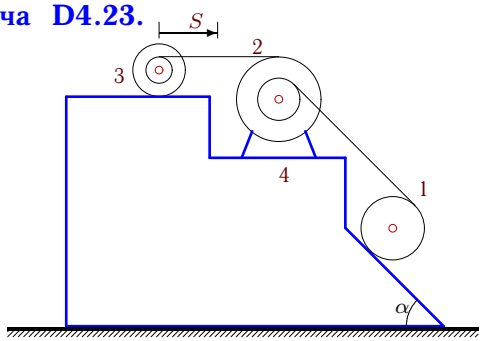
$R_2 = 5$, $r_2 = 3$, $m_1 = 6$, $m_2 = 12$, $m_3 = 12$, $m_4 = 12$, $S = 126$.

Задача D4.22.



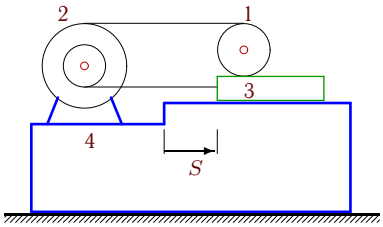
$R_1 = 5$, $r_1 = 3$, $R_2 = 5$, $r_2 = 3$, $m_1 = 5$, $m_2 = 15$, $m_3 = 25$, $m_4 = 12$, $S = 228$, $\cos\alpha = 0{,}6$.

Задача D4.23.



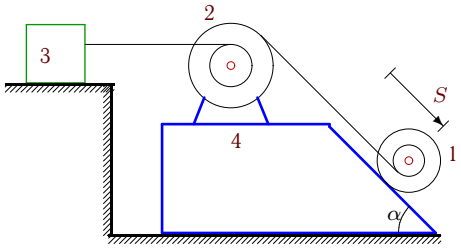
$R_2 = 5$, $r_2 = 3$, $R_3 = 4$, $r_3 = 2$, $m_1 = 25$, $m_2 = 13$, $m_3 = 15$, $m_4 = 15$, $S = 204$, $\cos\alpha = 0{,}8$.

Задача D4.24.



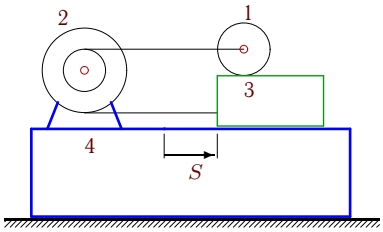
$R_2 = 3$, $r_2 = 2$, $m_1 = 4$, $m_2 = 12$, $m_3 = 13$, $m_4 = 13$, $S = 168$.

Задача D4.25.



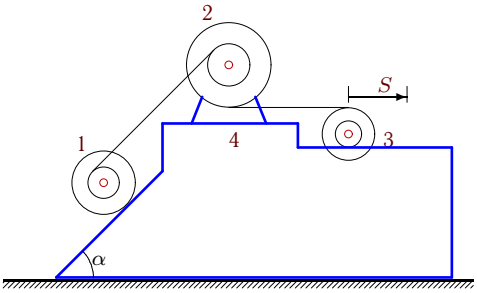
$R_1 = 3$, $r_1 = 2$, $R_2 = 3$, $r_2 = 2$, $m_1 = 10$, $m_2 = 10$, $m_3 = 18$, $m_4 = 10$, $S = 48$, $\cos\alpha = 0{,}8$.

Задача D4.26.



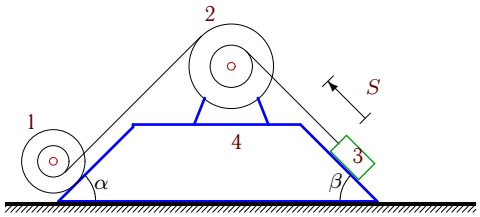
$R_2 = 5$, $r_2 = 3$, $m_1 = 5$, $m_2 = 13$, $m_3 = 15$, $m_4 = 15$, $S = 48$.

Задача D4.27.



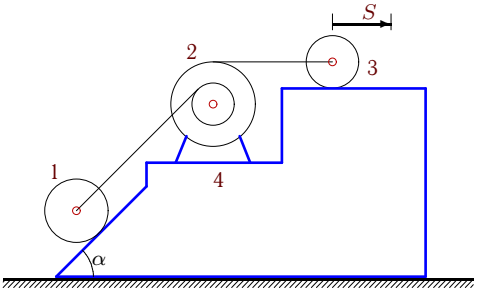
$R_1 = 3$, $r_1 = 2$, $R_2 = 5$, $r_2 = 3$, $R_3 = 4$, $r_3 = 3$, $m_1 = 50$, $m_2 = 13$, $m_3 = 15$, $m_4 = 15$, $S = 186$, $\alpha = \pi/3$.

Задача D4.28.



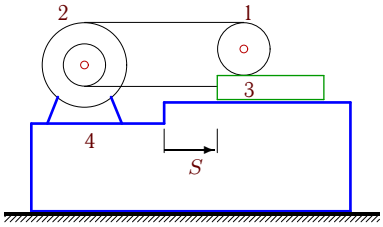
$R_1 = 4$, $r_1 = 2$, $R_2 = 4$, $r_2 = 3$, $m_1 = 10$, $m_2 = 15$, $m_3 = 6$, $m_4 = 13$, $S = 88$, $\cos\alpha = 0{,}6$, $\beta = \pi/3$.

Задача D4.29.



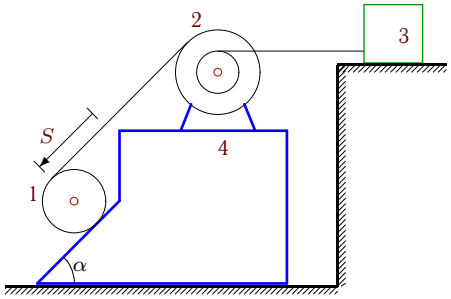
$R_2 = 3$, $r_2 = 2$, $m_1 = 3$, $m_2 = 12$, $m_3 = 13$, $m_4 = 13$, $S = 123$, $\alpha = \pi/3$.

Задача D4.30.



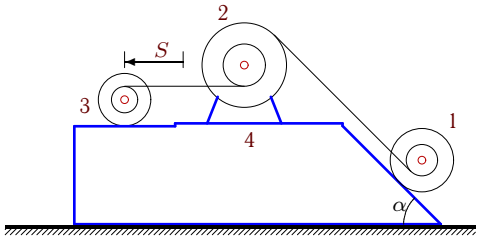
$R_2 = 5$, $r_2 = 3$, $m_1 = 6$, $m_2 = 13$, $m_3 = 12$, $m_4 = 15$, $S = 92$.

Задача D4.31.



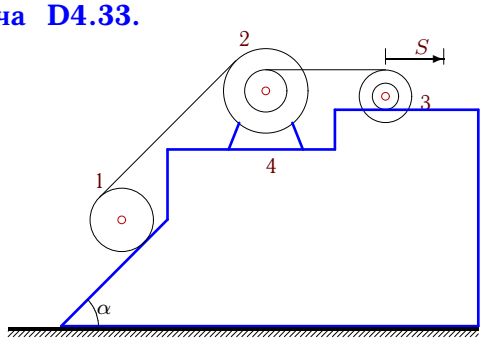
$R_2 = 3$, $r_2 = 2$, $m_1 = 5$, $m_2 = 12$, $m_3 = 3$, $m_4 = 10$, $S = 90$, $\cos\alpha = 0{,}6$.

Задача D4.32.



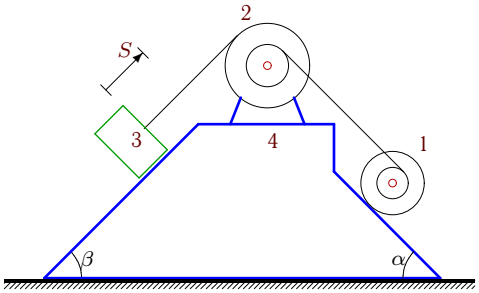
$R_1 = 3$, $r_1 = 2$, $R_2 = 4$, $r_2 = 3$, $R_3 = 3$, $r_3 = 2$, $m_1 = 3$, $m_2 = 13$, $m_3 = 12$, $m_4 = 13$, $S = 82$, $\cos\alpha = 0{,}8$.

Задача D4.33.



$R_2 = 4$, $r_2 = 3$, $R_3 = 3$, $r_3 = 2$, $m_1 = 1$, $m_2 = 12$, $m_3 = 12$, $m_4 = 13$, $S = 152$, $\cos\alpha = 0{,}6$.

Задача D4.34.



$R_1 = 5$, $r_1 = 3$, $R_2 = 4$, $r_2 = 2$, $m_1 = 8$, $m_2 = 12$, $m_3 = 10$, $m_4 = 12$, $S = 168$, $\cos\alpha = \cos\beta = 0{,}8$.

D4 **Ответы.**
Теорема о центре масс системы 26.08.2012

№	Δ_4
1	20
2	39
3	32
4	132
5	24
6	21
7	22
8	30
9	86
10	100
11	16
12	21
13	70
14	21
15	24
16	252
17	24
18	48
19	52
20	42
21	30
22	108
23	72
24	48
25	12
26	12
27	12
28	38
29	42
30	20
31	21
32	8
33	52
34	40

D4 файл o4d3A