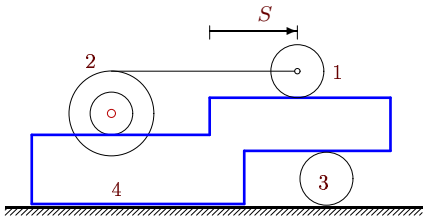
Теорема о центре масс системы

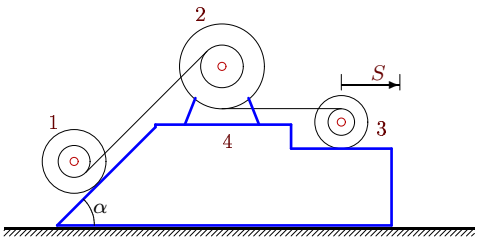
Механизм, состоящий из трех тел, установлен на призме, скользящей по гладкой плоскости. Нити, соединяющие тела, параллельны плоскостям. Под действием внутренних сил из состояния покоя механизм пришел в движение. Центр цилиндра (блока) или бруска сместился относительно призмы на расстояние S. Найти смещение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

Задача D-4.1. *Абалин Максим*



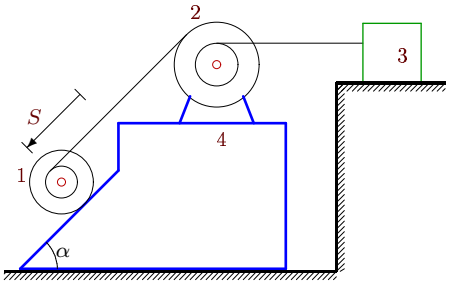
$R_2 = 5$, $r_2 = 3$, $m_1 = 15$, $m_2 = 16$, $m_3 = 30$, $m_4 = 15$, $S = 244$.

Задача D-4.2. *Абдулвалиев Роман*



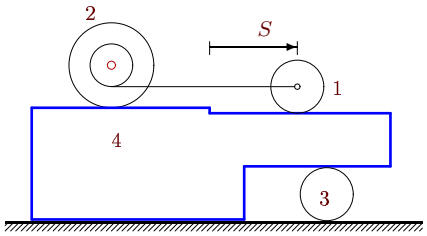
$R_1 = 5$, $r_1 = 3$, $R_2 = 4$, $r_2 = 3$, $R_3 = 3$, $r_3 = 2$, $m_1 = 16$, $m_2 = 15$, $m_3 = 12$, $m_4 = 10$, $S = 212$, $\alpha = \pi/3$.

Задача D-4.3. *Антонова Вера*



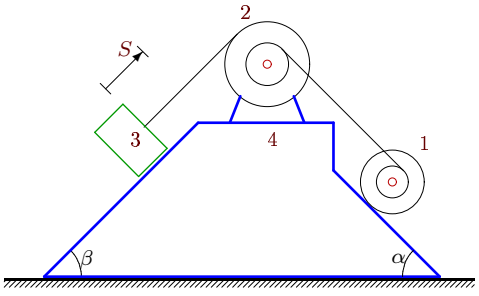
$R_1 = 3$, $r_1 = 2$, $R_2 = 5$, $r_2 = 3$, $m_1 = 5$, $m_2 = 10$, $m_3 = 1$, $m_4 = 15$, $S = 62$, $\cos\alpha = 0{,}6$.

Задача D-4.4. *Большаков Павел*



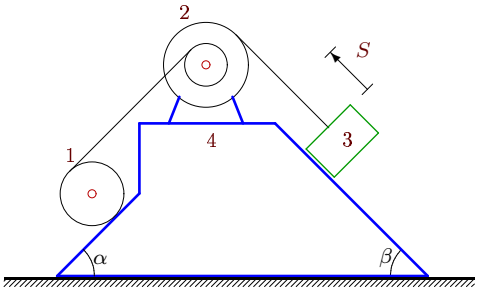
$R_2 = 4$, $r_2 = 2$, $m_1 = 13$, $m_2 = 2$, $m_3 = 24$, $m_4 = 13$, $S = 120$.

Задача D-4.5. *Воропай Руслан*



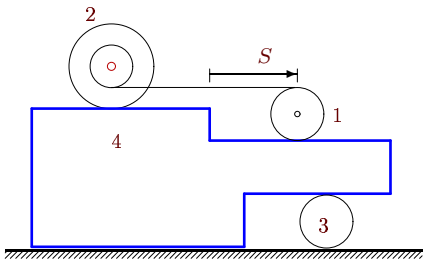
$R_1 = 3$, $r_1 = 2$, $R_2 = 4$, $r_2 = 3$, $m_1 = 50$, $m_2 = 13$, $m_3 = 10$, $m_4 = 10$, $S = 83$, $\cos\alpha = \cos\beta = 0{,}8$.

Задача D-4.6. *Ершов Леонид*



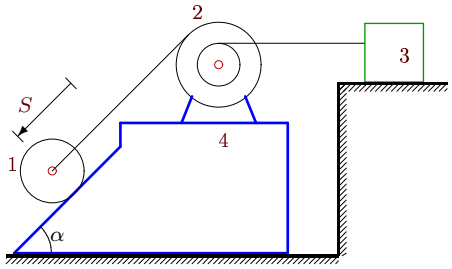
$R_2 = 4$, $r_2 = 2$, $m_1 = 16$, $m_2 = 15$, $m_3 = 4$, $m_4 = 15$, $S = 150$, $\alpha = \pi/3$, $\beta = \pi/3$.

Задача D-4.7. *Загородний Константин*



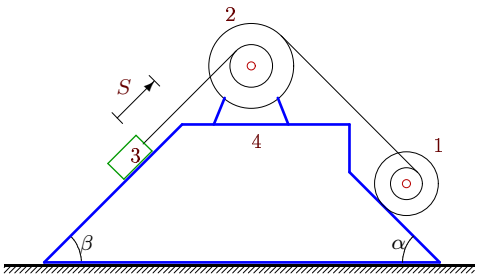
$R_2 = 3$, $r_2 = 2$, $m_1 = 10$, $m_2 = 2$, $m_3 = 30$, $m_4 = 15$, $S = 42$.

Задача D-4.8. *Казбаев Владимир*



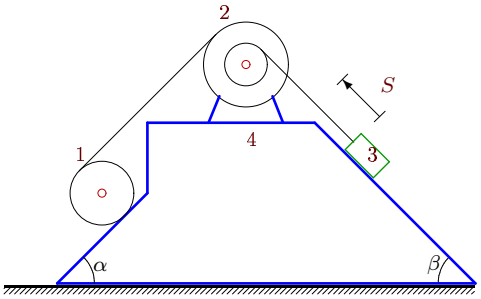
$R_2 = 3$, $r_2 = 2$, $m_1 = 4$, $m_2 = 13$, $m_3 = 3$, $m_4 = 13$, $S = 99$, $\alpha = \pi/3$.

Задача D-4.9. *Кириенок Дмитрий*



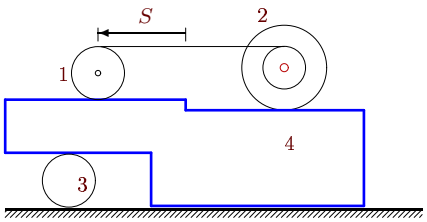
$R_1 = 4$, $r_1 = 3$, $R_2 = 3$, $r_2 = 2$, $m_1 = 70$, $m_2 = 13$, $m_3 = 6$, $m_4 = 13$, $S = 306$, $\cos\alpha = 0{,}8$, $\beta = \pi/3$.

Задача D-4.10. *Китайкина Ирина*



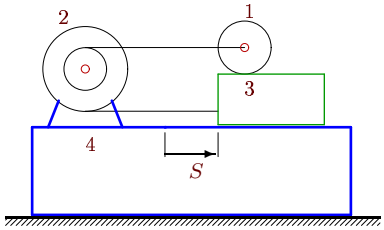
$R_2 = 3$, $r_2 = 2$, $m_1 = 40$, $m_2 = 13$, $m_3 = 6$, $m_4 = 10$, $S = 138$, $\cos\alpha = 0{,}6$, $\beta = \pi/3$.

Задача D-4.11. *Косарева Елена*



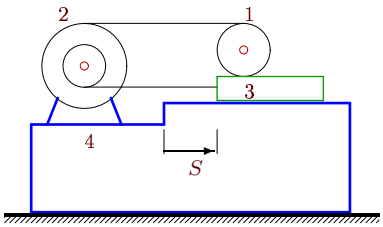
$R_2 = 4$, $r_2 = 2$, $m_1 = 13$, $m_2 = 12$, $m_3 = 20$, $m_4 = 13$, $S = 144$.

Задача D-4.12. *Костин Андрей*



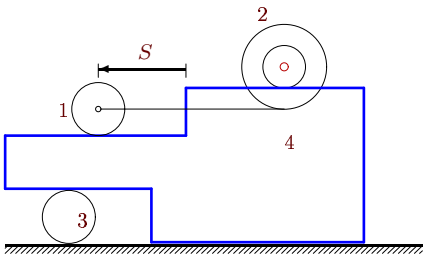
$R_2 = 3$, $r_2 = 2$, $m_1 = 3$, $m_2 = 12$, $m_3 = 10$, $m_4 = 10$, $S = 105$.

Задача D-4.13. *Любчик Владислав*



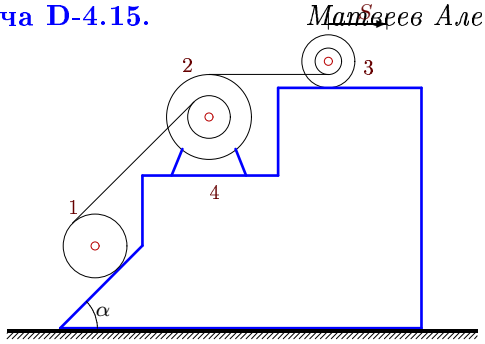
$R_2 = 5$, $r_2 = 3$, $m_1 = 6$, $m_2 = 15$, $m_3 = 15$, $m_4 = 12$, $S = 96$.

Задача D-4.14. *Маслов Владислав*



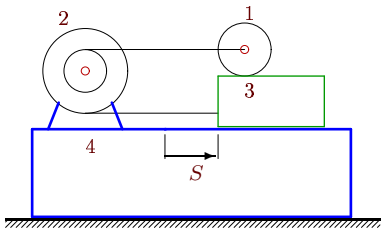
$R_2 = 5$, $r_2 = 3$, $m_1 = 12$, $m_2 = 6$, $m_3 = 26$, $m_4 = 13$, $S = 132$.

Задача D-4.15. *Матвеев Александр*



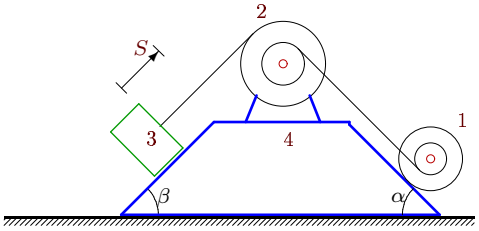
$R_2 = 5$, $r_2 = 3$, $R_3 = 4$, $r_3 = 2$, $m_1 = 100$, $m_2 = 10$, $m_3 = 15$, $m_4 = 15$, $S = 420$, $\cos\alpha = 0{,}6$.

Задача D-4.16. *Пиценко Денис*



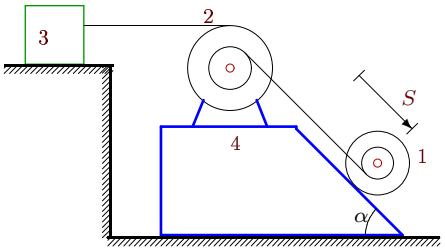
$R_2 = 3$, $r_2 = 2$, $m_1 = 3$, $m_2 = 10$, $m_3 = 13$, $m_4 = 10$, $S = 72$.

Задача D-4.17. *Плешанова Анна*



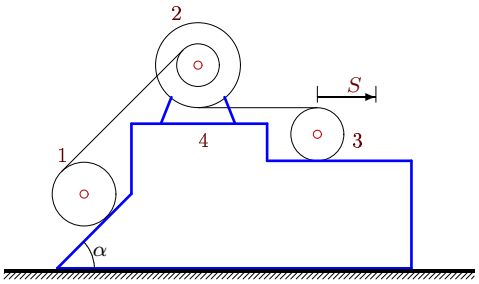
$R_1 = 4$, $r_1 = 3$, $R_2 = 4$, $r_2 = 2$, $m_1 = 10$, $m_2 = 13$, $m_3 = 6$, $m_4 = 15$, $S = 88$, $\cos\alpha = 0{,}8$, $\beta = \pi/3$.

Задача D-4.18. *Родионова Варвара*



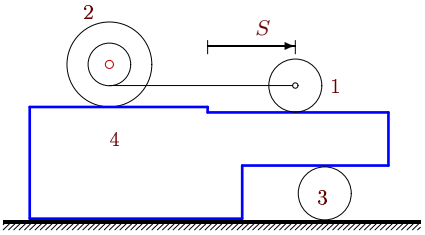
$R_1 = 4$, $r_1 = 2$, $R_2 = 5$, $r_2 = 3$, $m_1 = 10$, $m_2 = 15$, $m_3 = 6$, $m_4 = 12$, $S = 129$, $\cos\alpha = 0{,}8$.

Задача D-4.19. *Сулименко Данил*



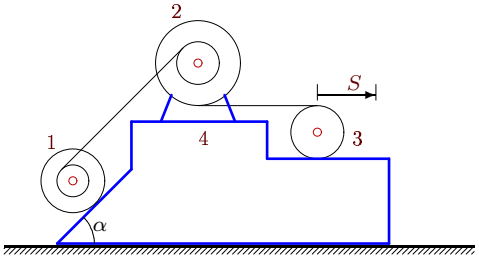
$R_2 = 3$, $r_2 = 2$, $m_1 = 3$, $m_2 = 10$, $m_3 = 10$, $m_4 = 10$, $S = 99$, $\alpha = \pi/3$.

Задача D-4.20. *Сысолетин Иван*



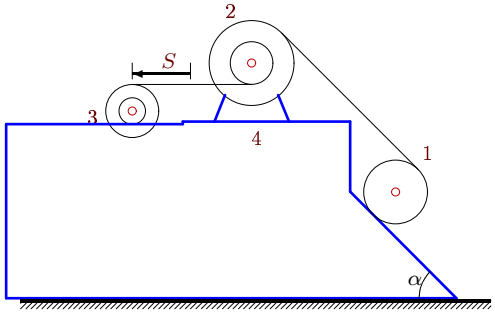
$R_2 = 4$, $r_2 = 2$, $m_1 = 13$, $m_2 = 4$, $m_3 = 26$, $m_4 = 12$, $S = 126$.

Задача D-4.21. *Фомичев Кирилл*



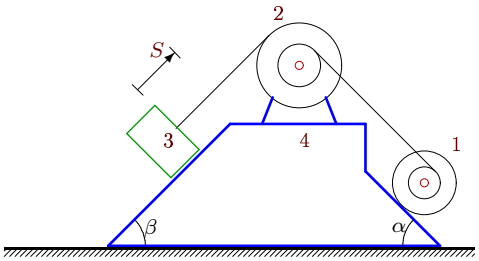
$R_1 = 4$, $r_1 = 3$, $R_2 = 5$, $r_2 = 3$, $m_1 = 175$, $m_2 = 10$, $m_3 = 12$, $m_4 = 15$, $S = 424$, $\cos\alpha = 0{,}6$.

Задача D-4.22. *Шпагина Юлия*



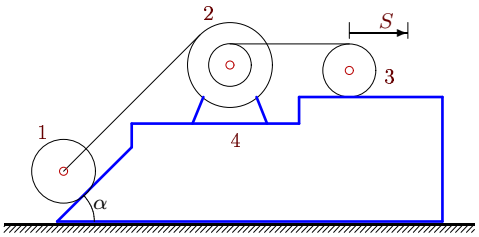
$R_2 = 3$, $r_2 = 2$, $R_3 = 5$, $r_3 = 3$, $m_1 = 5$, $m_2 = 15$, $m_3 = 10$, $m_4 = 10$, $S = 160$, $\cos\alpha = 0{,}8$.

Задача D-4.23. *Щеглов Иван*



$R_1 = 3$, $r_1 = 2$, $R_2 = 3$, $r_2 = 2$, $m_1 = 25$, $m_2 = 10$, $m_3 = 4$, $m_4 = 10$, $S = 98$, $\cos\alpha = 0{,}8$, $\beta = \pi/3$.

Задача D-4.24. *Карпов Юрий*



$R_2 = 5$, $r_2 = 3$, $m_1 = 1$, $m_2 = 13$, $m_3 = 15$, $m_4 = 15$, $S = 88$, $\cos\alpha = 0{,}6$.