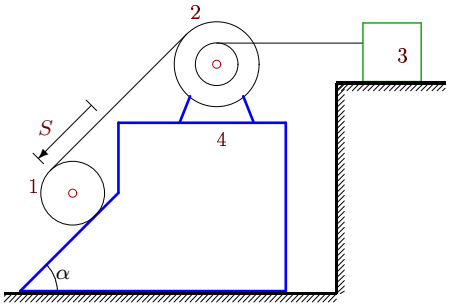
Теорема о центре масс системы

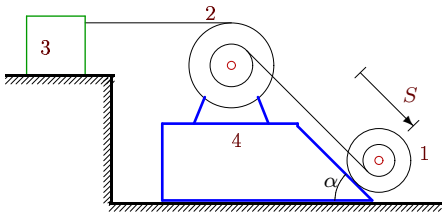
Механизм, состоящий из трех тел, установлен на призме, скользящей по гладкой плоскости. Нити, соединяющие тела, параллельны плоскостям. Под действием внутренних сил из состояния покоя механизм пришел в движение. Центр цилиндра (блока) или бруска сместился относительно призмы на расстояние S. Найти смещение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

Задача D-4.1. *Баранов Никита*



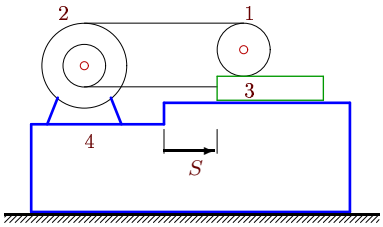
$R_2 = 5$, $r_2 = 3$, $m_1 = 4$, $m_2 = 13$, $m_3 = 5$, $m_4 = 15$, $S = 74$, $\alpha = \pi/3$.

Задача D-4.2. *Белинский Матвей*



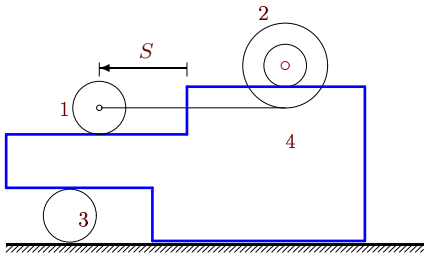
$R_1 = 5$, $r_1 = 3$, $R_2 = 5$, $r_2 = 3$, $m_1 = 5$, $m_2 = 12$, $m_3 = 6$, $m_4 = 12$, $S = 140$, $\cos\alpha = 0{,}8$.

Задача D-4.3. *Брагина Надежда*



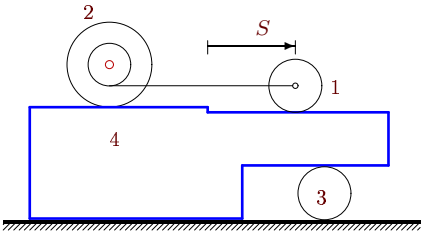
$R_2 = 3$, $r_2 = 2$, $m_1 = 4$, $m_2 = 13$, $m_3 = 13$, $m_4 = 13$, $S = 86$.

Задача D-4.4. *Головин Александр*



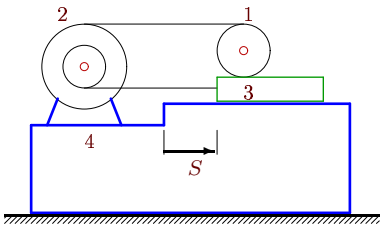
$R_2 = 5$, $r_2 = 3$, $m_1 = 15$, $m_2 = 3$, $m_3 = 26$, $m_4 = 13$, $S = 176$.

Задача D-4.5. *Доманов Евгений*



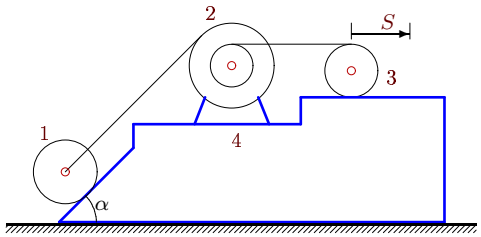
$R_2 = 4$, $r_2 = 3$, $m_1 = 15$, $m_2 = 1$, $m_3 = 30$, $m_4 = 12$, $S = 129$.

Задача D-4.6. *Желагин Андрей*



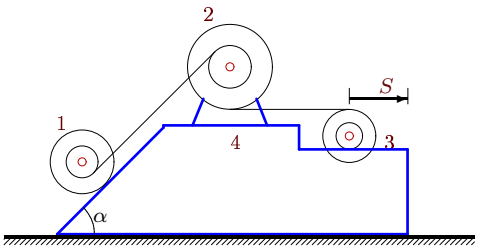
$R_2 = 4$, $r_2 = 2$, $m_1 = 4$, $m_2 = 10$, $m_3 = 13$, $m_4 = 15$, $S = 42$.

Задача D-4.7. *Идрисов Расим*



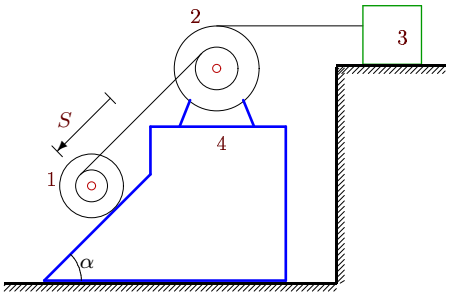
$R_2 = 5$, $r_2 = 3$, $m_1 = 3$, $m_2 = 12$, $m_3 = 15$, $m_4 = 15$, $S = 135$, $\alpha = \pi/3$.

Задача D-4.8. *Илюшин Александр*



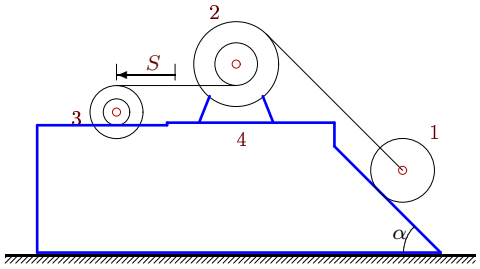
$R_1 = 3$, $r_1 = 2$, $R_2 = 4$, $r_2 = 3$, $R_3 = 4$, $r_3 = 2$, $m_1 = 8$, $m_2 = 10$, $m_3 = 12$, $m_4 = 13$, $S = 86$, $\alpha = \pi/3$.

Задача D-4.9. *Коваленко Василий*



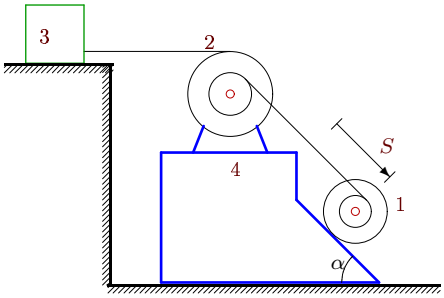
$R_1 = 5$, $r_1 = 3$, $R_2 = 3$, $r_2 = 2$, $m_1 = 10$, $m_2 = 12$, $m_3 = 5$, $m_4 = 13$, $S = 120$, $\cos\alpha = 0{,}6$.

Задача D-4.10. *Ковзан Иван*



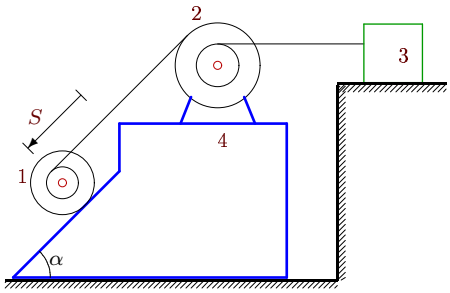
$R_2 = 3$, $r_2 = 2$, $R_3 = 5$, $r_3 = 3$, $m_1 = 5$, $m_2 = 12$, $m_3 = 13$, $m_4 = 13$, $S = 129$, $\cos\alpha = 0{,}8$.

Задача D-4.11. *Коклин Александр*



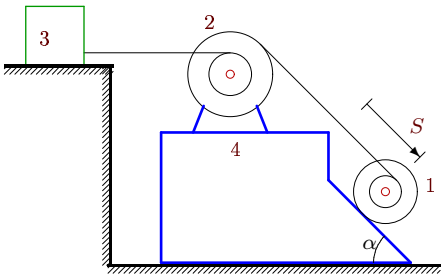
$R_1 = 5$, $r_1 = 3$, $R_2 = 5$, $r_2 = 3$, $m_1 = 10$, $m_2 = 15$, $m_3 = 3$, $m_4 = 12$, $S = 120$, $\cos\alpha = 0{,}8$.

Задача D-4.12. *Кудинова Юлия*



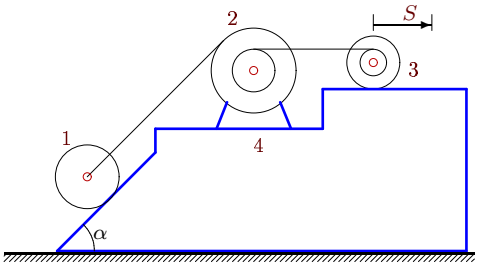
$R_1 = 4$, $r_1 = 3$, $R_2 = 4$, $r_2 = 2$, $m_1 = 4$, $m_2 = 13$, $m_3 = 16$, $m_4 = 12$, $S = 90$, $\alpha = \pi/3$.

Задача D-4.13. *Латышев Владислав*



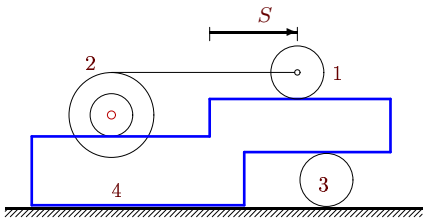
$R_1 = 3$, $r_1 = 2$, $R_2 = 4$, $r_2 = 3$, $m_1 = 10$, $m_2 = 10$, $m_3 = 4$, $m_4 = 10$, $S = 34$, $\cos\alpha = 0{,}8$.

Задача D-4.14. *Мацаренко Марк*



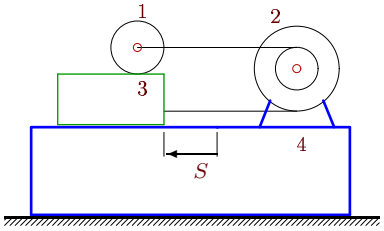
$R_2 = 3$, $r_2 = 2$, $R_3 = 3$, $r_3 = 2$, $m_1 = 2$, $m_2 = 13$, $m_3 = 13$, $m_4 = 13$, $S = 123$, $\cos\alpha = 0{,}6$.

Задача D-4.15. *Никишина Анастасия*



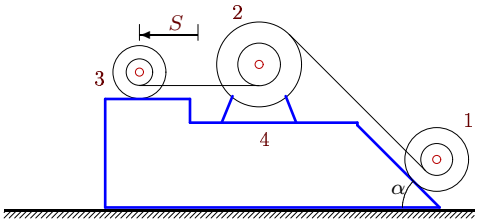
$R_2 = 5$, $r_2 = 3$, $m_1 = 12$, $m_2 = 8$, $m_3 = 30$, $m_4 = 12$, $S = 141$.

Задача D-4.16. *Платова Варвара*



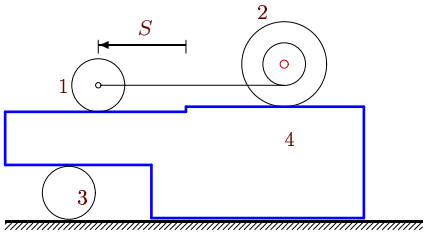
$R_2 = 4$, $r_2 = 2$, $m_1 = 4$, $m_2 = 13$, $m_3 = 10$, $m_4 = 15$, $S = 84$.

Задача D-4.17. *Разгуляев Никита*



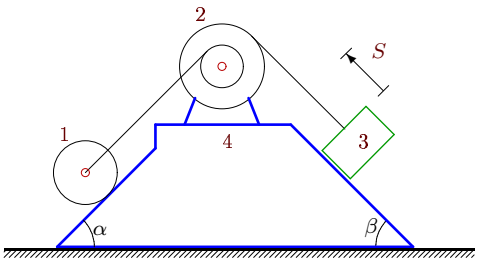
$R_1 = 5$, $r_1 = 3$, $R_2 = 4$, $r_2 = 3$, $R_3 = 4$, $r_3 = 3$, $m_1 = 3$, $m_2 = 15$, $m_3 = 12$, $m_4 = 13$, $S = 172$, $\cos\alpha = 0{,}8$.

Задача D-4.18. *Романов Алексей*



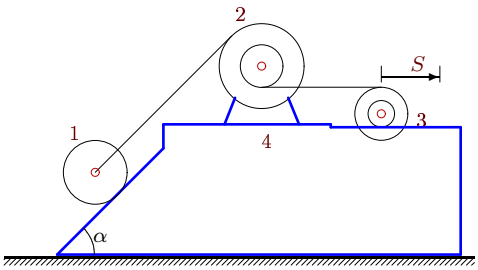
$R_2 = 4$, $r_2 = 2$, $m_1 = 10$, $m_2 = 4$, $m_3 = 24$, $m_4 = 13$, $S = 78$.

Задача D-4.19. *Саргин Артем*



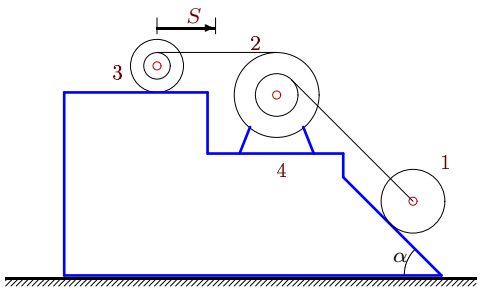
$R_2 = 5$, $r_2 = 3$, $m_1 = 25$, $m_2 = 13$, $m_3 = 10$, $m_4 = 15$, $S = 63$, $\cos\alpha = \cos\beta = 0{,}6$.

Задача D-4.20. *Соколов Никита*



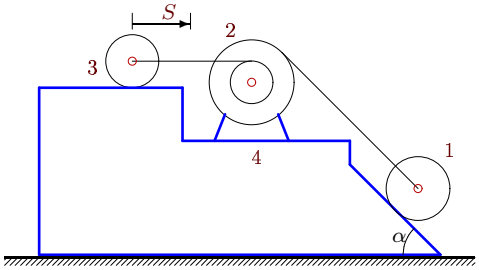
$R_2 = 4$, $r_2 = 2$, $R_3 = 4$, $r_3 = 3$, $m_1 = 3$, $m_2 = 12$, $m_3 = 10$, $m_4 = 15$, $S = 80$, $\alpha = \pi/3$.

Задача D-4.21. *Солодовников Вячеслав*



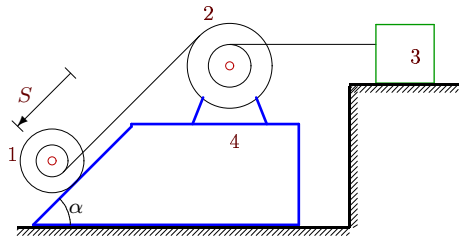
$R_2 = 4$, $r_2 = 3$, $R_3 = 4$, $r_3 = 2$, $m_1 = 10$, $m_2 = 10$, $m_3 = 15$, $m_4 = 10$, $S = 45$, $\cos\alpha = 0{,}8$.

Задача D-4.22. *Степанова Дарья*



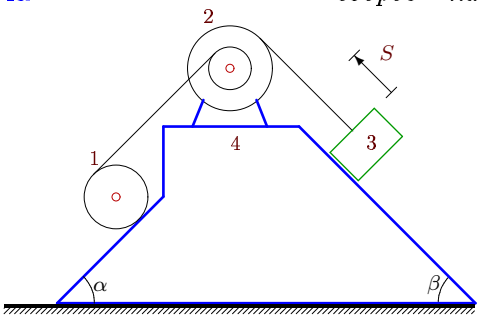
$R_2 = 4$, $r_2 = 3$, $m_1 = 15$, $m_2 = 15$, $m_3 = 15$, $m_4 = 10$, $S = 165$, $\cos\alpha = 0{,}8$.

Задача D-4.23. *Тулупова Наталья*



$R_1 = 5$, $r_1 = 3$, $R_2 = 3$, $r_2 = 2$, $m_1 = 10$, $m_2 = 15$, $m_3 = 15$, $m_4 = 10$, $S = 200$, $\cos\alpha = 0{,}6$.

Задача D-4.24. *Федоров Владислав*



$R_2 = 4$, $r_2 = 3$, $m_1 = 40$, $m_2 = 15$, $m_3 = 15$, $m_4 = 13$, $S = 166$, $\cos\alpha = 0{,}6$, $\cos\beta = 0{,}8$.