

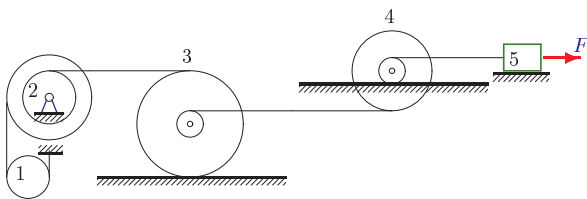
Теорема об изменении кинетической энергии

Механическая система, состоящая из пяти тел 1, 2, 3, 4 и 5, движется под действием внешних сил. Заданы радиусы цилиндров и блоков. Радиусы инерции ρ даны для блоков, цилиндры считать однородными. Горизонтальный стержень, находящийся в зацеплении с блоками, считать невесомым. Массы даны в килограммах, радиусы — в сантиметрах. Найти математическое ожидание скорости груза 1 или центра цилиндра (блока) 1, который опустится по вертикали вниз на случайную величину S с рядом распределения $p = [0.1, 0.4, 0.3, 0.2]$. Приблизительно принять $g = 9.81 \text{ м/с}^2$.

Кирсанов М.Н. Задачи по теоретической механике с решениями в **Maple 11**. – М.: ФИЗМАТЛИТ, 2010. — 264 с. (с.111)

Задача 24.1.

Абалимов Александр

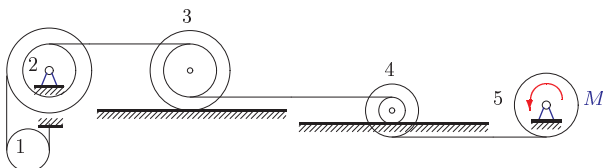


$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 2, \\ R_3 &= 4, r_3 = 1, \rho_3 = 3, \\ R_4 &= 3, r_4 = 1, \rho_4 = 2, \\ m_1 &= 2, m_2 = 20, \\ m_3 &= 256, m_4 = 256, \\ m_5 &= 128. \end{aligned}$$

$$S = [10.2, 10.5, 10.7, 10.8] \text{ м.}$$

Задача 24.2.

Антощенко Анастасия

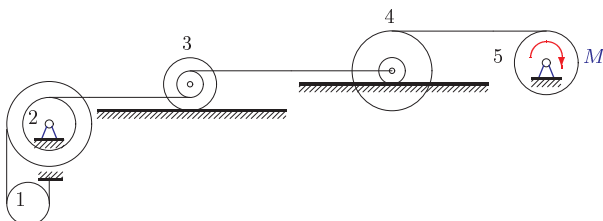


$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 2, \\ R_3 &= 3, r_3 = 2, \rho_3 = 2, \\ R_4 &= 2, r_4 = 1, \rho_4 = 1, \\ m_1 &= 2, m_2 = 24, \\ m_3 &= 100, m_4 = 150, \\ m_5 &= 200. \end{aligned}$$

$$S = [10.2, 10.5, 10.6, 10.9] \text{ м.}$$

Задача 24.3.

Безруков Игорь

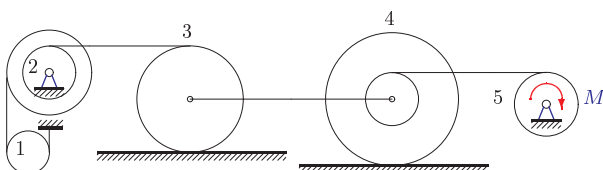


$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 2, \\ R_3 &= 2, r_3 = 1, \rho_3 = 1, \\ R_4 &= 3, r_4 = 1, \rho_4 = 2, \\ m_1 &= 2, m_2 = 8, \\ m_3 &= 4, m_4 = 3, \\ m_5 &= 2. \end{aligned}$$

$$S = [7.2, 7.4, 7.6, 7.8] \text{ м.}$$

Задача 24.4.

Безязыков Александр

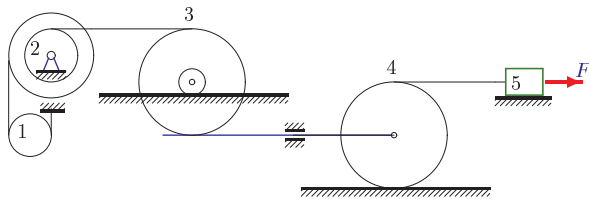


$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 3, \\ R_3 &= 4, \\ R_4 &= 5, r_4 = 2, \rho_4 = 4, \\ m_1 &= 2, m_2 = 12, \\ m_3 &= 32, m_4 = 100, \\ m_5 &= 200. \end{aligned}$$

$$S = [4.3, 4.4, 4.6, 4.9] \text{ м.}$$

Задача 24.5.

Габбасова Камилла

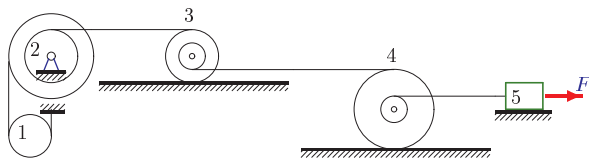


$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 3, \\ R_3 &= 4, r_3 = 1, \rho_3 = 3, \\ R_4 &= 4, \\ m_1 &= 10, m_2 = 16, \\ m_3 &= 40, m_4 = 350, \\ m_5 &= 150. \end{aligned}$$

$$S = [3.3, 3.4, 3.7, 3.8] \text{ м.}$$

Задача 24.6.

Дворский Андрей

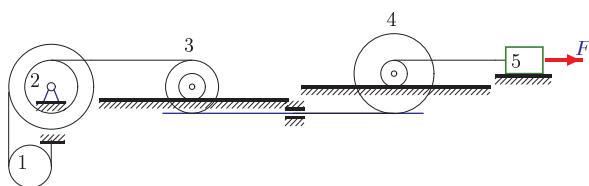


$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 3, \\ R_3 &= 2, r_3 = 1, \rho_3 = 1, \\ R_4 &= 3, r_4 = 1, \rho_4 = 2, \\ m_1 &= 2, m_2 = 20, \\ m_3 &= 64, m_4 = 576, \\ m_5 &= 72. \end{aligned}$$

$$S = [1.3, 1.5, 1.6, 1.9] \text{ м.}$$

Задача 24.7.

Демидов Александр

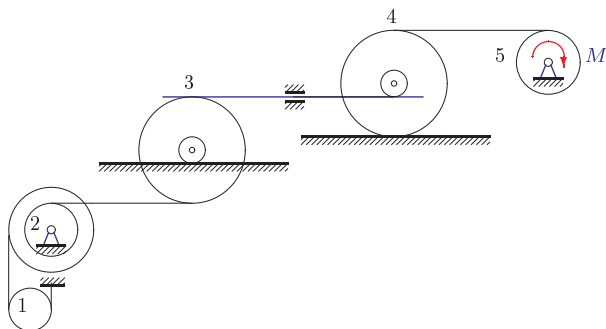


$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 2, \\ R_3 &= 2, r_3 = 1, \rho_3 = 1, \\ R_4 &= 3, r_4 = 1, \rho_4 = 2, \\ m_1 &= 2, m_2 = 20, \\ m_3 &= 36, m_4 = 108, \\ m_5 &= 18. \end{aligned}$$

$$S = [10.3, 10.4, 10.7, 10.9] \text{ м.}$$

Задача 24.8.

Дробчик Георгий

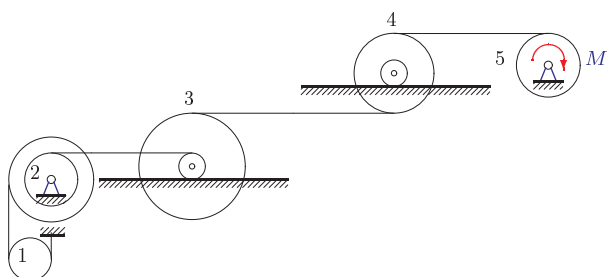


$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 3, \\ R_3 &= 4, r_3 = 1, \rho_3 = 3, \\ R_4 &= 4, r_4 = 1, \rho_4 = 3, \\ m_1 &= 2, m_2 = 12, \\ m_3 &= 36, m_4 = 81, \\ m_5 &= 162. \end{aligned}$$

$$S = [2.2, 2.4, 2.6, 2.9] \text{ м.}$$

Задача 24.9.

Киртин Валерий

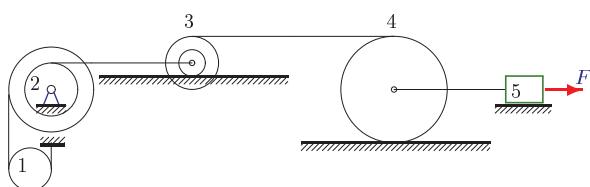


$$S = [8.2, 8.4, 8.6, 8.9] \text{ м.}$$

$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 2, \\ R_3 &= 4, r_3 = 1, \rho_3 = 3, \\ R_4 &= 3, r_4 = 1, \rho_4 = 2, \\ m_1 &= 2, m_2 = 20, \\ m_3 &= 8, m_4 = 16, \\ m_5 &= 4. \end{aligned}$$

Задача 24.10.

Королева Татьяна

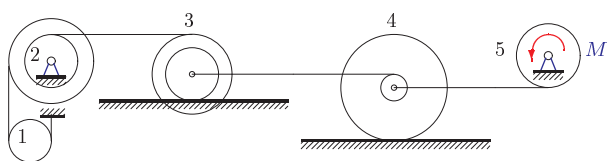


$$S = [3.3, 3.4, 3.7, 3.9] \text{ м.}$$

$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 3, \\ R_3 &= 2, r_3 = 1, \rho_3 = 1, \\ R_4 &= 4, \\ m_1 &= 2, m_2 = 16, \\ m_3 &= 4, m_4 = 24, \\ m_5 &= 8. \end{aligned}$$

Задача 24.11.

Кузнецов Степан

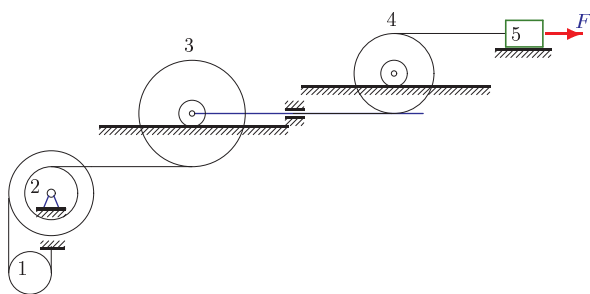


$$S = [4.3, 4.4, 4.6, 4.8] \text{ м.}$$

$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 3, \\ R_3 &= 3, r_3 = 2, \rho_3 = 2, \\ R_4 &= 4, r_4 = 1, \rho_4 = 3, \\ m_1 &= 2, m_2 = 16, \\ m_3 &= 100, m_4 = 75, \\ m_5 &= 1250. \end{aligned}$$

Задача 24.12.

Майков Дмитрий

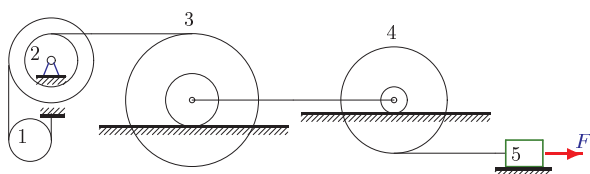


$$S = [8.3, 8.5, 8.6, 8.9] \text{ м.}$$

$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 2, \\ R_3 &= 4, r_3 = 1, \rho_3 = 3, \\ R_4 &= 3, r_4 = 1, \rho_4 = 2, \\ m_1 &= 2, m_2 = 20, \\ m_3 &= 36, m_4 = 108, \\ m_5 &= 18. \end{aligned}$$

Задача 24.13.

Нессанс Эдгар Матъяс

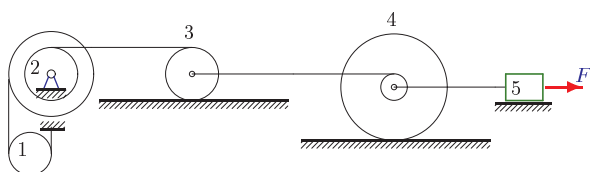


$$S = [9.3, 9.5, 9.7, 9.9] \text{ м.}$$

$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 2, \\ R_3 &= 5, r_3 = 2, \rho_3 = 4, \\ R_4 &= 4, r_4 = 1, \rho_4 = 3, \\ m_1 &= 2, m_2 = 12, \\ m_3 &= 196, m_4 = 147, \\ m_5 &= 98. \end{aligned}$$

Задача 24.14.

Ромич Антон

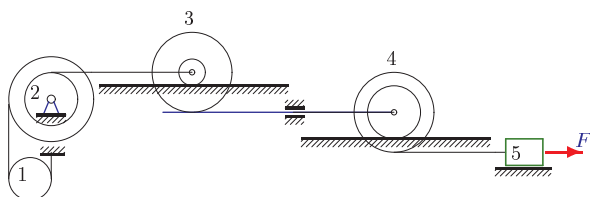


$$S = [4.2, 4.5, 4.7, 4.9] \text{ м.}$$

$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 3, \\ R_3 &= 2, \\ R_4 &= 4, r_4 = 1, \rho_4 = 3, \\ m_1 &= 2, m_2 = 12, \\ m_3 &= 32, m_4 = 12, \\ m_5 &= 50. \end{aligned}$$

Задача 24.15.

Солдатов Александр

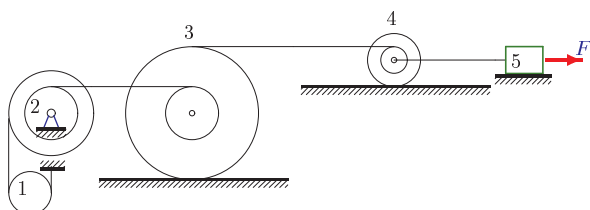


$$S = [9.3, 9.4, 9.7, 9.9] \text{ м.}$$

$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 2, \\ R_3 &= 3, r_3 = 1, \rho_3 = 2, \\ R_4 &= 3, r_4 = 2, \rho_4 = 2, \\ m_1 &= 2, m_2 = 4, \\ m_3 &= 4, m_4 = 3, \\ m_5 &= 2. \end{aligned}$$

Задача 24.16.

Толмачёв Никита

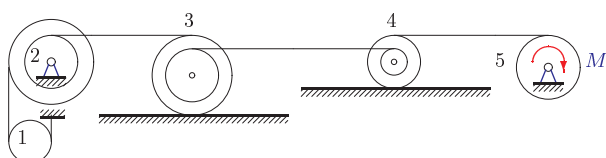


$$S = [4.3, 4.5, 4.7, 4.8] \text{ м.}$$

$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 3, \\ R_3 &= 5, r_3 = 2, \rho_3 = 4, \\ R_4 &= 2, r_4 = 1, \rho_4 = 1, \\ m_1 &= 2, m_2 = 24, \\ m_3 &= 196, m_4 = 441, \\ m_5 &= 441. \end{aligned}$$

Задача 24.17.

Толушкин Ростислав

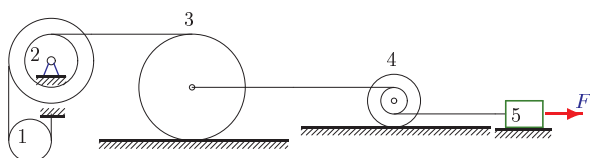


$$S = [1.3, 1.4, 1.6, 1.8] \text{ м.}$$

$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 3, \\ R_3 &= 3, r_3 = 2, \rho_3 = 2, \\ R_4 &= 2, r_4 = 1, \rho_4 = 1, \\ m_1 &= 2, m_2 = 24, \\ m_3 &= 144, m_4 = 324, \\ m_5 &= 162. \end{aligned}$$

Задача 24.18.

Трифонов Дмитрий

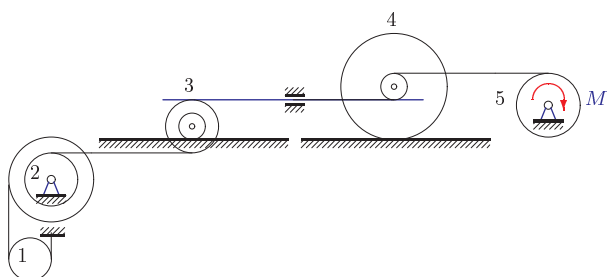


$$S = [5.3, 5.4, 5.7, 5.8] \text{ м.}$$

$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 3, \\ R_3 &= 4, \\ R_4 &= 2, r_4 = 1, \rho_4 = 1, \\ m_1 &= 10, m_2 = 24, \\ m_3 &= 64, m_4 = 252, \\ m_5 &= 216. \end{aligned}$$

Задача 24.19.

Чумаков Иван

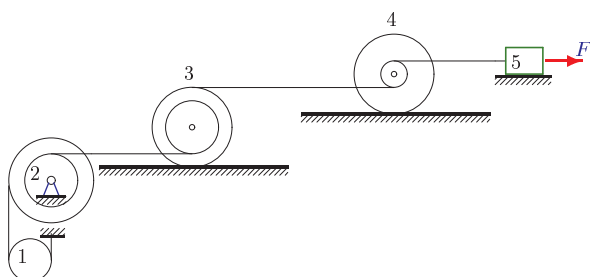


$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 3, \\ R_3 &= 2, r_3 = 1, \rho_3 = 1, \\ R_4 &= 4, r_4 = 1, \rho_4 = 3, \\ m_1 &= 2, m_2 = 16, \\ m_3 &= 4, m_4 = 3, \\ m_5 &= 4. \end{aligned}$$

$$S = [5.2, 5.4, 5.6, 5.8] \text{ м.}$$

Задача 24.20.

Шибанов Сергей



$$\begin{aligned} R_2 &= 4, r_2 = 2, \rho_2 = 3, \\ R_3 &= 3, r_3 = 2, \rho_3 = 2, \\ R_4 &= 3, r_4 = 1, \rho_4 = 2, \\ m_1 &= 2, m_2 = 20, \\ m_3 &= 4, m_4 = 3, \\ m_5 &= 1. \end{aligned}$$

$$S = [5.3, 5.5, 5.7, 5.9] \text{ м.}$$