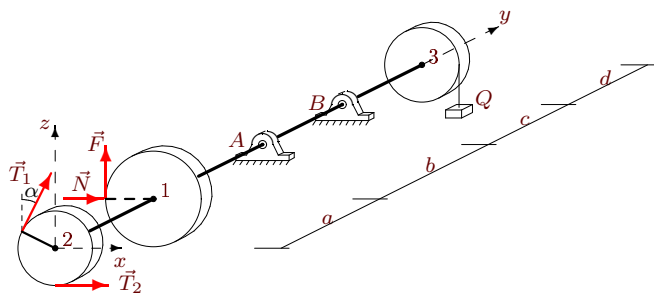


## Вал

Горизонтальный вал весом  $G$  может вращаться в цилиндрических шарнирах  $A$  и  $B$ . К шкиву 1 приложено нормальное давление  $N$  и касательная сила сопротивления  $F$ , пропорциональная  $N$ . На шкив 2 действуют силы натяжения ремней  $T_1$  и  $T_2$ . Груз  $Q$  висит на нити, навитой на шкив 3. Определить силу давления  $N$  и реакции шарниров в условии равновесия вала. Учесть веса шкивов  $P_1, P_2, P_3$ . Все нагрузки действуют в вертикальной плоскости. Силы даны в ньютонах, размеры — в сантиметрах.

Кирсанов М.Н. **Решебник. Теоретическая механика**/Под ред. А. И. Кириллова.— М.: ФИЗМАТЛИТ, 2008. — 384 с. (с.94.)

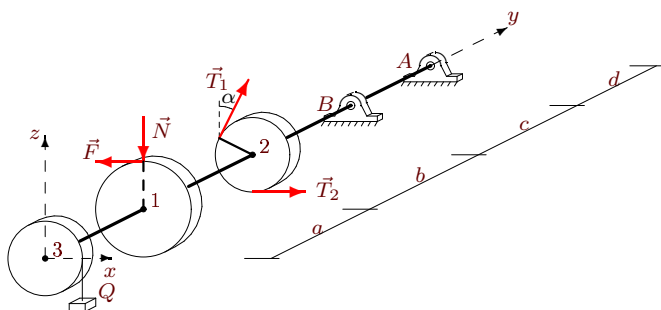
### Задача S-17.1.



*Аббуд Карам Али*

$$\begin{aligned}
 F &= 0.1N, T_1 = 50, \\
 T_2 &= 96, P_1 = 22, \\
 P_2 &= 10, P_3 = 14, \\
 Q &= 22, G = 25, \\
 \alpha &= 30^\circ, R_1 = 26, \\
 R_2 &= 8, R_3 = 9, \\
 a &= 22, b = 26, \\
 c &= 27, d = 26.
 \end{aligned}$$

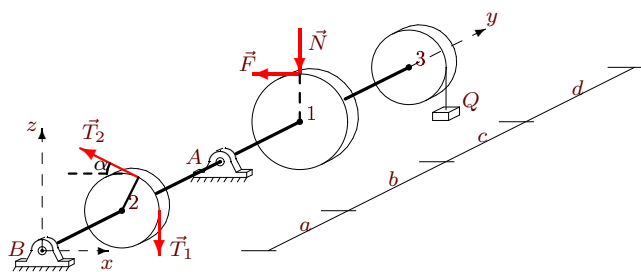
### Задача S-17.2.



*Богомолова Арина*

$$\begin{aligned}
 F &= 0.4N, T_1 = 70, \\
 T_2 &= 39, P_1 = 46, \\
 P_2 &= 30, P_3 = 38, \\
 Q &= 10, G = 35, \\
 \alpha &= 60^\circ, R_1 = 30, \\
 R_2 &= 12, R_3 = 14, \\
 a &= 24, b = 25, \\
 c &= 28, d = 28.
 \end{aligned}$$

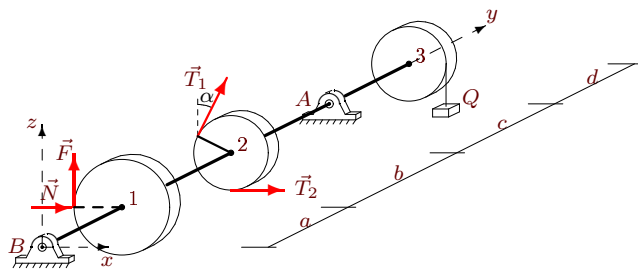
### Задача S-17.3.



*Долгушев Алексей*

$$\begin{aligned}
 F &= 0.3N, T_1 = 40, \\
 T_2 &= 23, P_1 = 22, \\
 P_2 &= 10, P_3 = 18, \\
 Q &= 26, G = 20, \\
 \alpha &= 30^\circ, R_1 = 18, \\
 R_2 &= 8, R_3 = 10, \\
 a &= 24, b = 29, \\
 c &= 30, d = 26.
 \end{aligned}$$

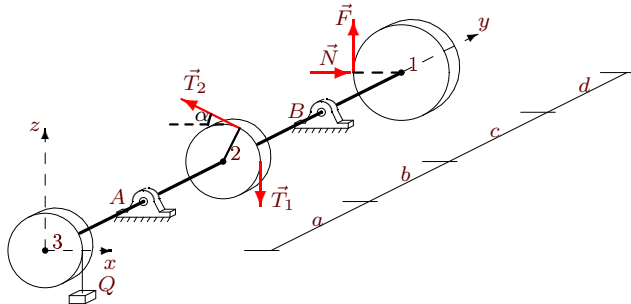
**Задача S-17.4.**



*Зайцев Сергей*

$F = 0.2N$ ,  $T_1 = 40$ ,  
 $T_2 = 76$ ,  $P_1 = 42$ ,  
 $P_2 = 30$ ,  $P_3 = 34$ ,  
 $Q = 22$ ,  $G = 20$ ,  
 $\alpha = 60^\circ$ ,  $R_1 = 30$ ,  
 $R_2 = 12$ ,  $R_3 = 13$ ,  
 $a = 22$ ,  $b = 26$ ,  
 $c = 29$ ,  $d = 26$ .

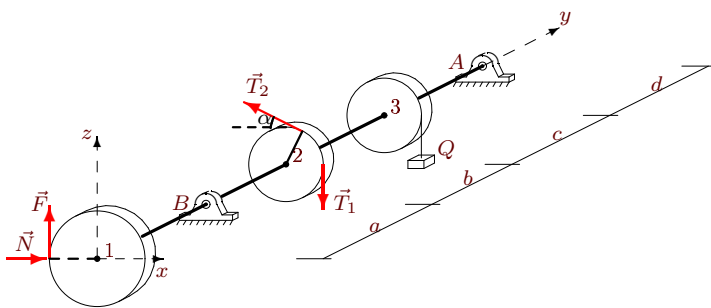
**Задача S-17.5.**



*Исаев Илья*

$F = 0.4N$ ,  $T_1 = 70$ ,  
 $T_2 = 138$ ,  $P_1 = 40$ ,  
 $P_2 = 30$ ,  $P_3 = 38$ ,  
 $Q = 14$ ,  $G = 35$ ,  
 $\alpha = 60^\circ$ ,  $R_1 = 18$ ,  
 $R_2 = 12$ ,  $R_3 = 14$ ,  
 $a = 24$ ,  $b = 26$ ,  
 $c = 29$ ,  $d = 25$ .

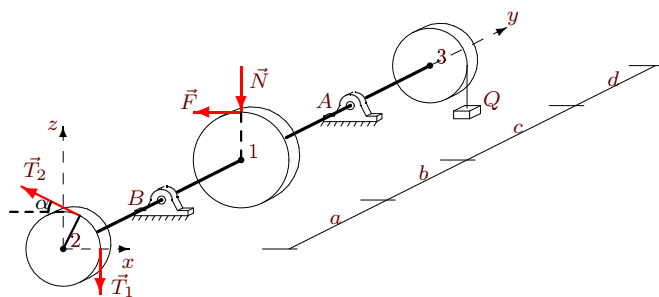
**Задача S-17.6.**



*Камынин Даниил*

$F = 0.4N$ ,  $T_1 = 60$ ,  
 $T_2 = 118$ ,  $P_1 = 32$ ,  
 $P_2 = 20$ ,  $P_3 = 28$ ,  
 $Q = 14$ ,  $G = 30$ ,  
 $\alpha = 45^\circ$ ,  $R_1 = 20$ ,  
 $R_2 = 10$ ,  $R_3 = 12$ ,  
 $a = 24$ ,  $b = 26$ ,  
 $c = 28$ ,  $d = 26$ .

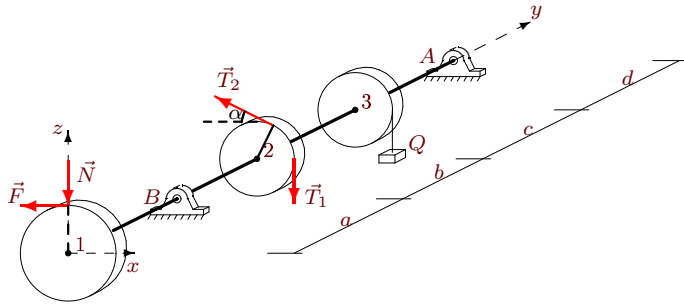
**Задача S-17.7.**



*Коршиков Максим*

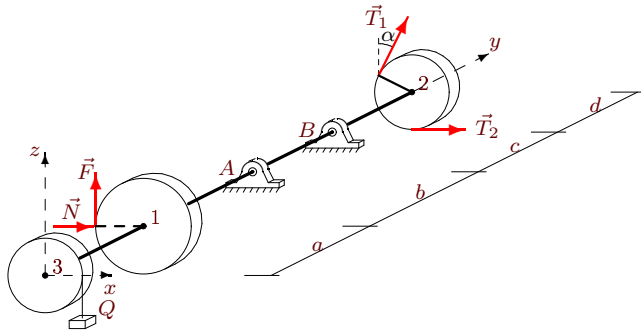
$F = 0.2N$ ,  $T_1 = 50$ ,  
 $T_2 = 27$ ,  $P_1 = 38$ ,  
 $P_2 = 30$ ,  $P_3 = 34$ ,  
 $Q = 26$ ,  $G = 25$ ,  
 $\alpha = 60^\circ$ ,  $R_1 = 22$ ,  
 $R_2 = 12$ ,  $R_3 = 13$ ,  
 $a = 22$ ,  $b = 27$ ,  
 $c = 30$ ,  $d = 24$ .

**Задача S-17.8.**



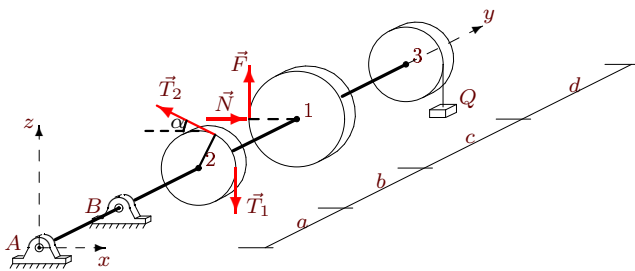
*Кузнецов Иван*  
 $F = 0.4N, T_1 = 60,$   
 $T_2 = 34, P_1 = 32,$   
 $P_2 = 20, P_3 = 28,$   
 $Q = 26, G = 30,$   
 $\alpha = 45^\circ, R_1 = 20,$   
 $R_2 = 10, R_3 = 12,$   
 $a = 24, b = 29,$   
 $c = 31, d = 26.$

**Задача S-17.9.**



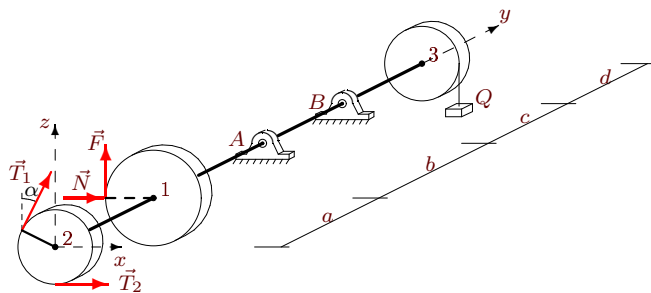
*Куренкова Виктория*  
 $F = 0.2N, T_1 = 70,$   
 $T_2 = 136, P_1 = 22,$   
 $P_2 = 10, P_3 = 14,$   
 $Q = 22, G = 35,$   
 $\alpha = 30^\circ, R_1 = 26,$   
 $R_2 = 8, R_3 = 9,$   
 $a = 22, b = 26,$   
 $c = 27, d = 26.$

**Задача S-17.10.**



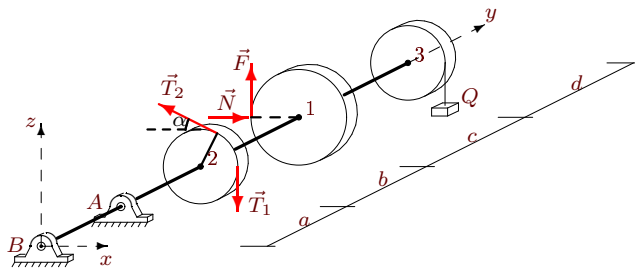
*Лысенкова Анастасия*  
 $F = 0.3N, T_1 = 30,$   
 $T_2 = 58, P_1 = 30,$   
 $P_2 = 20, P_3 = 28,$   
 $Q = 14, G = 15,$   
 $\alpha = 45^\circ, R_1 = 16,$   
 $R_2 = 10, R_3 = 12,$   
 $a = 24, b = 26,$   
 $c = 28, d = 25.$

**Задача S-17.11.**



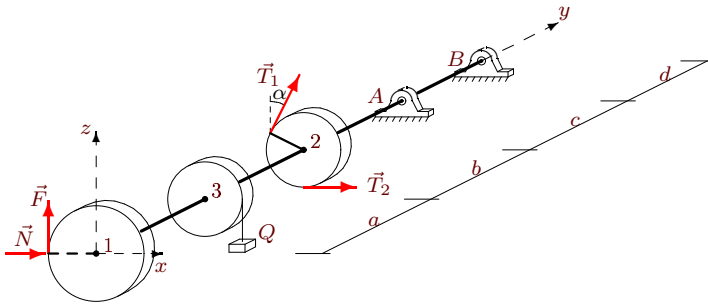
*Львов Дмитрий*  
 $F = 0.1N, T_1 = 50,$   
 $T_2 = 96, P_1 = 20,$   
 $P_2 = 10, P_3 = 14,$   
 $Q = 22, G = 25,$   
 $\alpha = 30^\circ, R_1 = 22,$   
 $R_2 = 8, R_3 = 9,$   
 $a = 22, b = 26,$   
 $c = 27, d = 25.$

**Задача S-17.12.**



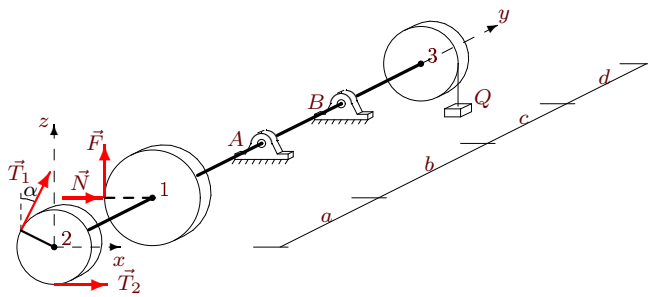
*Маликова Регина*  
 $F = 0.3N, T_1 = 40,$   
 $T_2 = 76, P_1 = 20,$   
 $P_2 = 10, P_3 = 18,$   
 $Q = 22, G = 20,$   
 $\alpha = 30^\circ, R_1 = 14,$   
 $R_2 = 8, R_3 = 10,$   
 $a = 24, b = 28,$   
 $c = 29, d = 25.$

**Задача S-17.13.**



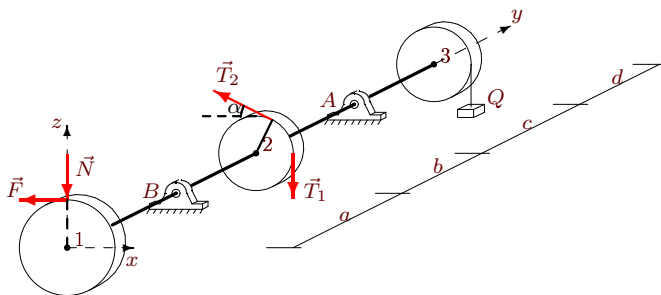
*Манев Илья*  
 $F = 0.2N, T_1 = 60,$   
 $T_2 = 118, P_1 = 42,$   
 $P_2 = 30, P_3 = 34,$   
 $Q = 14, G = 30,$   
 $\alpha = 60^\circ, R_1 = 30,$   
 $R_2 = 12, R_3 = 13,$   
 $a = 22, b = 24,$   
 $c = 27, d = 26.$

**Задача S-17.14.**



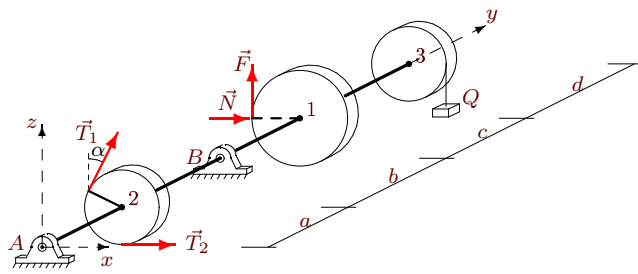
*Опрокиднёв Эрнст*  
 $F = 0.4N, T_1 = 50,$   
 $T_2 = 96, P_1 = 26,$   
 $P_2 = 10, P_3 = 18,$   
 $Q = 22, G = 25,$   
 $\alpha = 30^\circ, R_1 = 26,$   
 $R_2 = 8, R_3 = 10,$   
 $a = 24, b = 28,$   
 $c = 29, d = 28.$

**Задача S-17.15.**



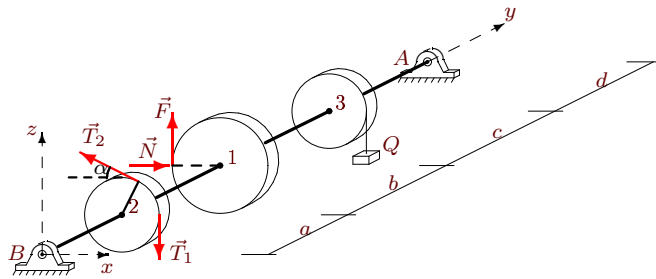
*Пошибаев Алексей*  
 $F = 0.1N, T_1 = 60,$   
 $T_2 = 31, P_1 = 38,$   
 $P_2 = 30, P_3 = 34,$   
 $Q = 26, G = 30,$   
 $\alpha = 60^\circ, R_1 = 22,$   
 $R_2 = 12, R_3 = 13,$   
 $a = 22, b = 27,$   
 $c = 30, d = 24.$

**Задача S-17.16.**



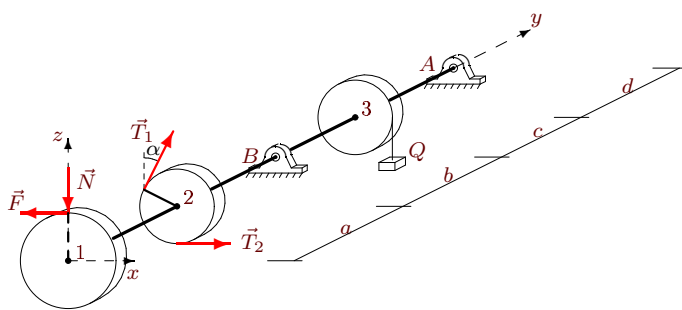
*Привезенов Николай*  
 $F = 0.1N$ ,  $T_1 = 30$ ,  
 $T_2 = 58$ ,  $P_1 = 20$ ,  
 $P_2 = 10$ ,  $P_3 = 14$ ,  
 $Q = 14$ ,  $G = 15$ ,  
 $\alpha = 30^\circ$ ,  $R_1 = 22$ ,  
 $R_2 = 8$ ,  $R_3 = 9$ ,  
 $a = 22$ ,  $b = 24$ ,  
 $c = 25$ ,  $d = 25$ .

**Задача S-17.17.**



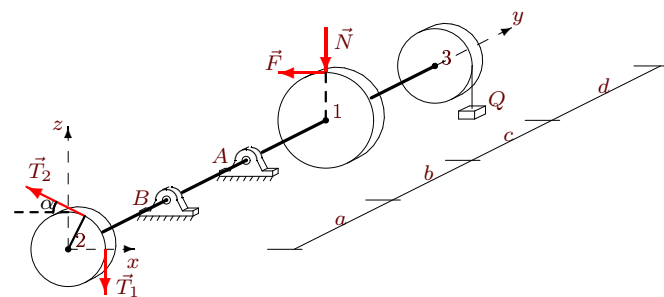
*Пышкина Инна*  
 $F = 0.4N$ ,  $T_1 = 40$ ,  
 $T_2 = 77$ ,  $P_1 = 32$ ,  
 $P_2 = 20$ ,  $P_3 = 28$ ,  
 $Q = 18$ ,  $G = 20$ ,  
 $\alpha = 45^\circ$ ,  $R_1 = 20$ ,  
 $R_2 = 10$ ,  $R_3 = 12$ ,  
 $a = 24$ ,  $b = 27$ ,  
 $c = 29$ ,  $d = 26$ .

**Задача S-17.18.**



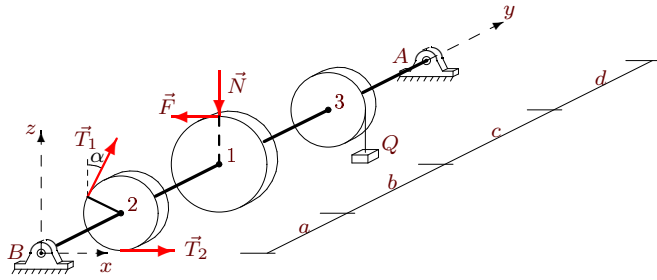
*Рашитов Данил*  
 $F = 0.4N$ ,  $T_1 = 60$ ,  
 $T_2 = 34$ ,  $P_1 = 34$ ,  
 $P_2 = 20$ ,  $P_3 = 28$ ,  
 $Q = 26$ ,  $G = 30$ ,  
 $\alpha = 45^\circ$ ,  $R_1 = 24$ ,  
 $R_2 = 10$ ,  $R_3 = 12$ ,  
 $a = 24$ ,  $b = 29$ ,  
 $c = 31$ ,  $d = 27$ .

**Задача S-17.19.**



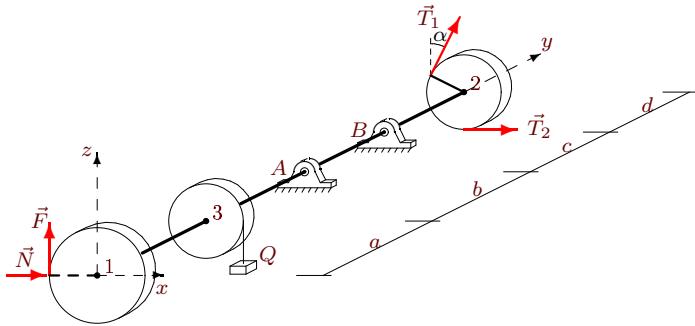
*Свиридов Георгий*  
 $F = 0.2N$ ,  $T_1 = 50$ ,  
 $T_2 = 27$ ,  $P_1 = 18$ ,  
 $P_2 = 10$ ,  $P_3 = 14$ ,  
 $Q = 10$ ,  $G = 25$ ,  
 $\alpha = 30^\circ$ ,  $R_1 = 18$ ,  
 $R_2 = 8$ ,  $R_3 = 9$ ,  
 $a = 22$ ,  $b = 23$ ,  
 $c = 24$ ,  $d = 24$ .

**Задача S-17.20.**



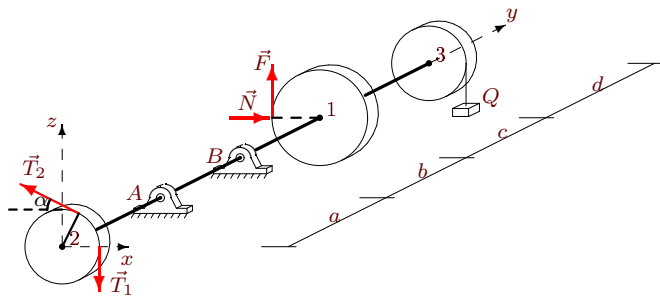
*Скляр Никита*  
 $F = 0.4N, T_1 = 40,$   
 $T_2 = 24, P_1 = 44,$   
 $P_2 = 30, P_3 = 38,$   
 $Q = 10, G = 20,$   
 $\alpha = 60^\circ, R_1 = 26,$   
 $R_2 = 12, R_3 = 14,$   
 $a = 24, b = 25,$   
 $c = 28, d = 27.$

**Задача S-17.21.**



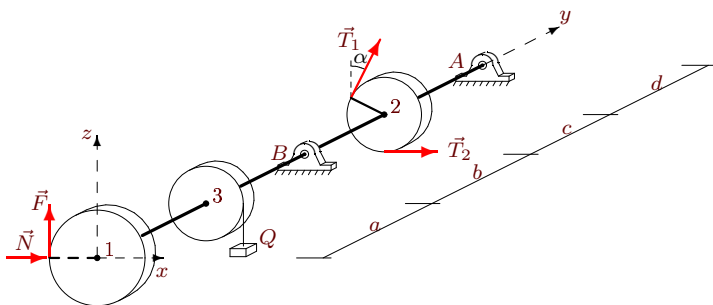
*Телицын Данил*  
 $F = 0.4N, T_1 = 60,$   
 $T_2 = 117, P_1 = 26,$   
 $P_2 = 10, P_3 = 18,$   
 $Q = 18, G = 30,$   
 $\alpha = 30^\circ, R_1 = 26,$   
 $R_2 = 8, R_3 = 10,$   
 $a = 24, b = 27,$   
 $c = 28, d = 28.$

**Задача S-17.22.**



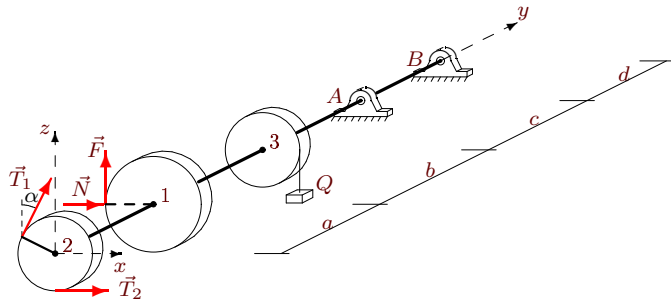
*Ковалев Д.*  
 $F = 0.2N, T_1 = 50,$   
 $T_2 = 97, P_1 = 26,$   
 $P_2 = 20, P_3 = 24,$   
 $Q = 18, G = 25,$   
 $\alpha = 45^\circ, R_1 = 16,$   
 $R_2 = 10, R_3 = 11,$   
 $a = 22, b = 25,$   
 $c = 27, d = 23.$

**Задача S-17.23.**



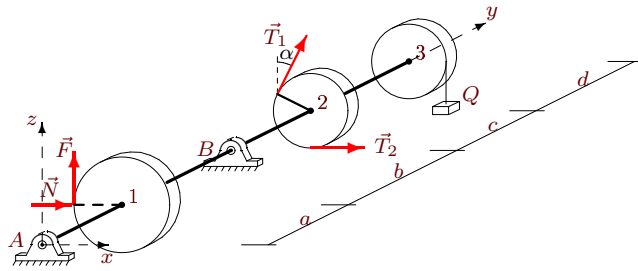
*Трякин Михаил*  
 $F = 0.3N, T_1 = 60,$   
 $T_2 = 116, P_1 = 36,$   
 $P_2 = 20, P_3 = 28,$   
 $Q = 22, G = 30,$   
 $\alpha = 45^\circ, R_1 = 28,$   
 $R_2 = 10, R_3 = 12,$   
 $a = 24, b = 28,$   
 $c = 30, d = 28.$

Задача S-17.24.



Шибин Руслан  
 $F = 0.1N$ ,  $T_1 = 50$ ,  
 $T_2 = 98$ ,  $P_1 = 42$ ,  
 $P_2 = 30$ ,  $P_3 = 34$ ,  
 $Q = 14$ ,  $G = 25$ ,  
 $\alpha = 60^\circ$ ,  $R_1 = 30$ ,  
 $R_2 = 12$ ,  $R_3 = 13$ ,  
 $a = 22$ ,  $b = 24$ ,  
 $c = 27$ ,  $d = 26$ .

Задача S-17.25.



Штыленко Антон  
 $F = 0.4N$ ,  $T_1 = 30$ ,  
 $T_2 = 58$ ,  $P_1 = 26$ ,  
 $P_2 = 10$ ,  $P_3 = 18$ ,  
 $Q = 22$ ,  $G = 15$ ,  
 $\alpha = 30^\circ$ ,  $R_1 = 26$ ,  
 $R_2 = 8$ ,  $R_3 = 10$ ,  
 $a = 24$ ,  $b = 28$ ,  
 $c = 29$ ,  $d = 28$ .