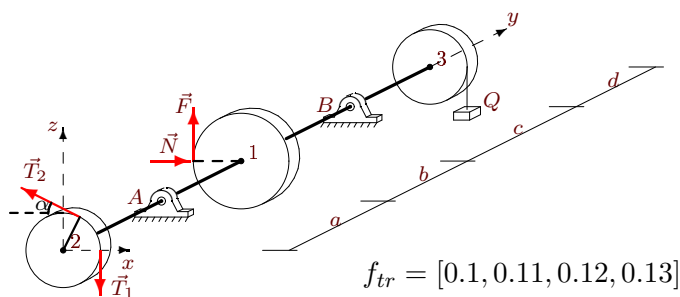


Вал

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. Найти математические ожидания реакции шарниров в условии равновесия вала, если коэффициент трения f задан как случайная величина с рядом распределения $p = [0.2, 0.3, 0.4, 0.1]$. 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. **Решebник. Теоретическая механика** / Под ред. А. И. Кириллова. — М.: ФИЗМАТЛИТ, 2008. — 384 с. (с.94.)

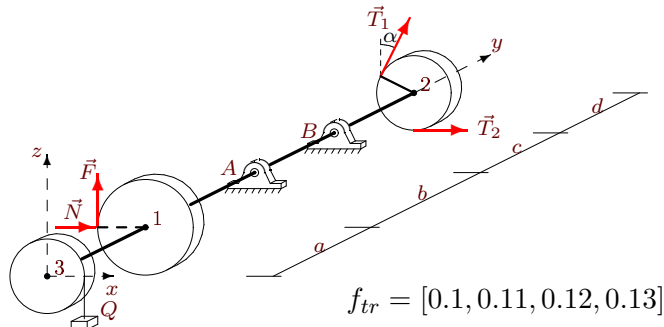
Задача L-22.1.



Барина Анастасия

$F = fN, T_1 = 50,$
 $T_2 = 98, P_1 = 36,$
 $P_2 = 30, P_3 = 34,$
 $Q = 14, G = 25,$
 $\alpha = 60^\circ, R_1 = 18,$
 $R_2 = 12, R_3 = 13,$
 $a = 22, b = 24,$
 $c = 27, d = 23.$

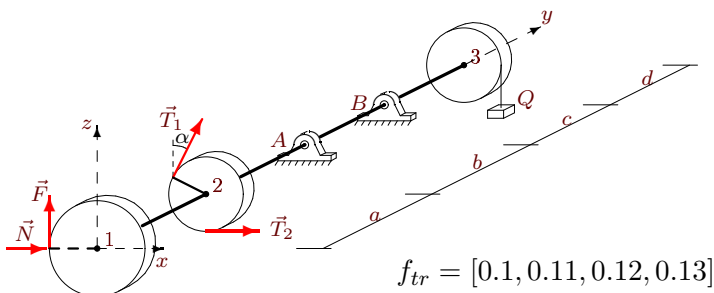
Задача L-22.2.



Безобразова Анна

$F = fN, T_1 = 70,$
 $T_2 = 138, P_1 = 22,$
 $P_2 = 10, P_3 = 14,$
 $Q = 14, G = 35,$
 $\alpha = 30^\circ, R_1 = 26,$
 $R_2 = 8, R_3 = 9,$
 $a = 22, b = 24,$
 $c = 25, d = 26.$

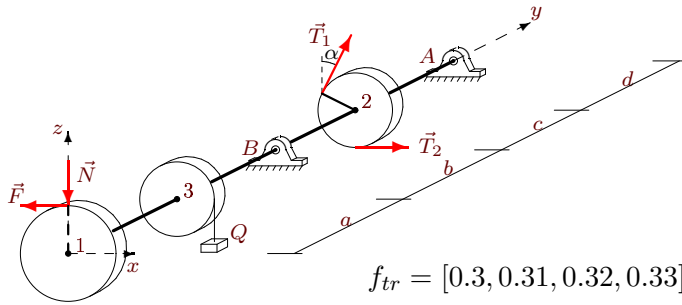
Задача L-22.3.



Дубов Дмитрий

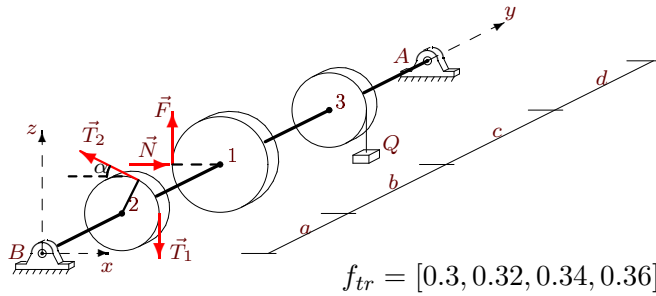
$F = fN, T_1 = 60,$
 $T_2 = 117, P_1 = 20,$
 $P_2 = 10, P_3 = 14,$
 $Q = 18, G = 30,$
 $\alpha = 30^\circ, R_1 = 22,$
 $R_2 = 8, R_3 = 9,$
 $a = 22, b = 25,$
 $c = 26, d = 25.$

Задача L-22.4.



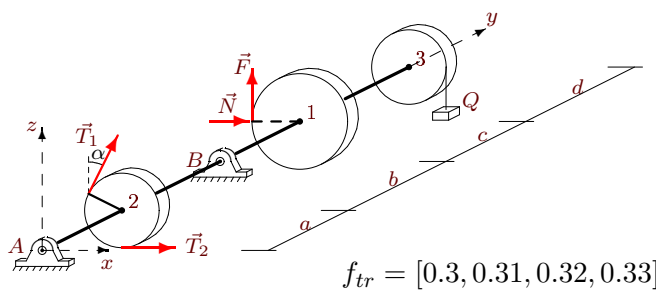
Коцеев Артем
 $F = fN, T_1 = 60,$
 $T_2 = 33, P_1 = 36,$
 $P_2 = 20, P_3 = 28,$
 $Q = 26, G = 30,$
 $\alpha = 45^\circ, R_1 = 28,$
 $R_2 = 10, R_3 = 12,$
 $a = 24, b = 29,$
 $c = 31, d = 28.$

Задача L-22.5.



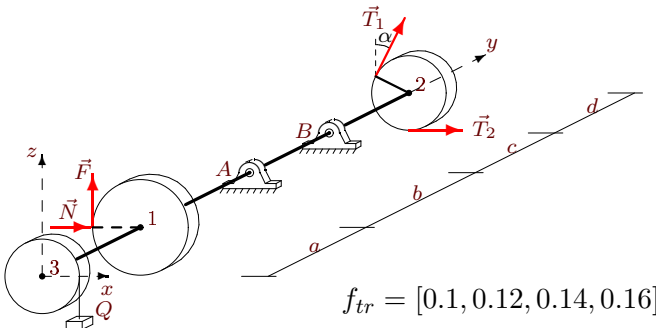
Логвинец Артем
 $F = fN, T_1 = 40,$
 $T_2 = 76, P_1 = 42,$
 $P_2 = 30, P_3 = 38,$
 $Q = 22, G = 20,$
 $\alpha = 60^\circ, R_1 = 22,$
 $R_2 = 12, R_3 = 14,$
 $a = 24, b = 28,$
 $c = 31, d = 26.$

Задача L-22.6.



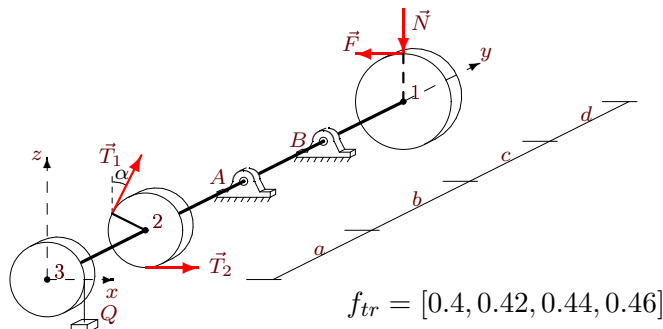
Малянов Иван
 $F = fN, T_1 = 30,$
 $T_2 = 57, P_1 = 24,$
 $P_2 = 10, P_3 = 18,$
 $Q = 18, G = 15,$
 $\alpha = 30^\circ, R_1 = 22,$
 $R_2 = 8, R_3 = 10,$
 $a = 24, b = 27,$
 $c = 28, d = 27.$

Задача L-22.7.



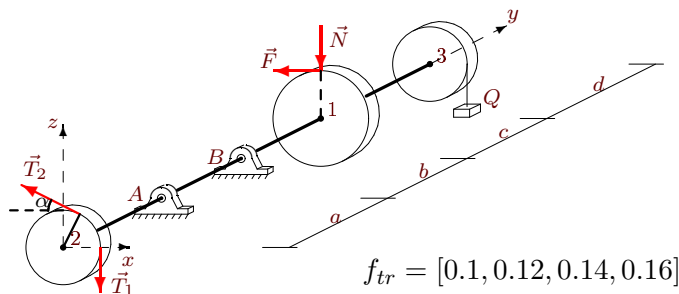
Рябцев Андрей
 $F = fN, T_1 = 70,$
 $T_2 = 138, P_1 = 22,$
 $P_2 = 10, P_3 = 14,$
 $Q = 14, G = 35,$
 $\alpha = 30^\circ, R_1 = 26,$
 $R_2 = 8, R_3 = 9,$
 $a = 22, b = 24,$
 $c = 25, d = 26.$

Задача L-22.8.



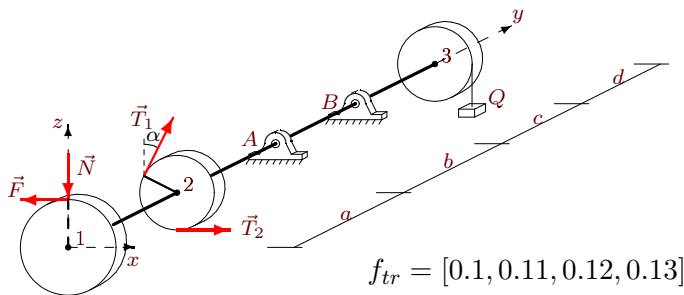
Сайпулаев Муса
 $F = fN, T_1 = 70,$
 $T_2 = 39, P_1 = 24,$
 $P_2 = 10, P_3 = 18,$
 $Q = 26, G = 35,$
 $\alpha = 30^\circ, R_1 = 22,$
 $R_2 = 8, R_3 = 10,$
 $a = 24, b = 29,$
 $c = 30, d = 27.$

Задача L-22.9.



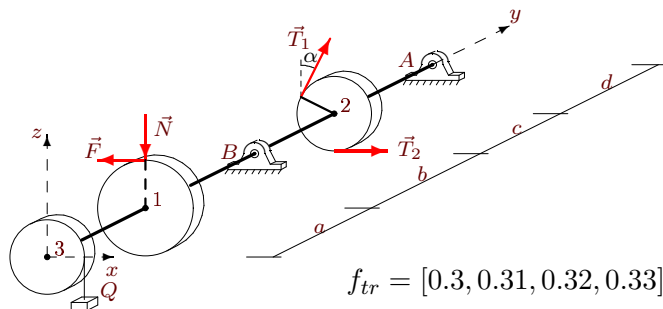
Смирнов Павел
 $F = fN, T_1 = 50,$
 $T_2 = 26, P_1 = 16,$
 $P_2 = 10, P_3 = 14,$
 $Q = 10, G = 25,$
 $\alpha = 30^\circ, R_1 = 14,$
 $R_2 = 8, R_3 = 9,$
 $a = 22, b = 23,$
 $c = 24, d = 23.$

Задача L-22.10.



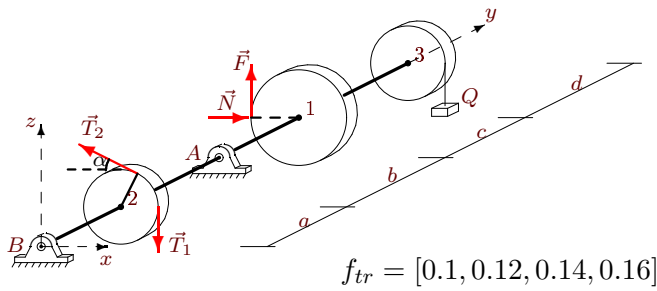
Цыганов Дмитрий
 $F = fN, T_1 = 60,$
 $T_2 = 31, P_1 = 20,$
 $P_2 = 10, P_3 = 14,$
 $Q = 10, G = 30,$
 $\alpha = 30^\circ, R_1 = 22,$
 $R_2 = 8, R_3 = 9,$
 $a = 22, b = 23,$
 $c = 24, d = 25.$

Задача L-22.11.



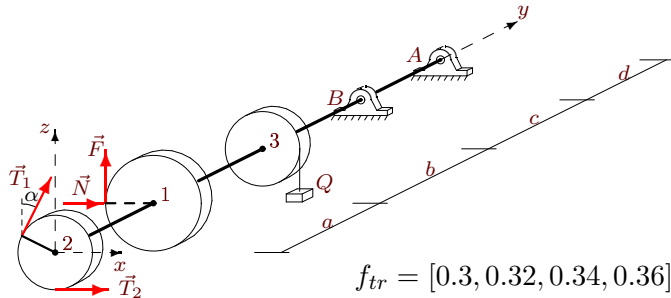
Васин Павел
 $F = fN, T_1 = 70,$
 $T_2 = 38, P_1 = 36,$
 $P_2 = 20, P_3 = 28,$
 $Q = 10, G = 35,$
 $\alpha = 45^\circ, R_1 = 28,$
 $R_2 = 10, R_3 = 12,$
 $a = 24, b = 25,$
 $c = 27, d = 28.$

Задача L-22.12.



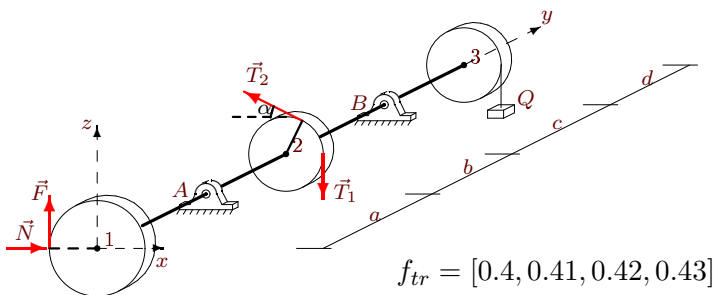
Похвалитова Анна
 $F = fN, T_1 = 40,$
 $T_2 = 76, P_1 = 18,$
 $P_2 = 10, P_3 = 14,$
 $Q = 22, G = 20,$
 $\alpha = 30^\circ, R_1 = 18,$
 $R_2 = 8, R_3 = 9,$
 $a = 22, b = 26,$
 $c = 27, d = 24.$

Задача L-22.13.



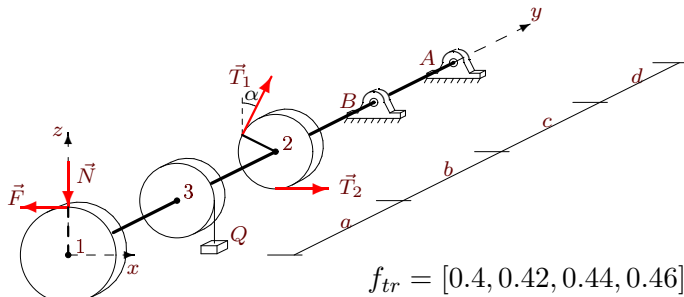
Сенчихина Дарья
 $F = fN, T_1 = 50,$
 $T_2 = 96, P_1 = 46,$
 $P_2 = 30, P_3 = 38,$
 $Q = 22, G = 25,$
 $\alpha = 60^\circ, R_1 = 30,$
 $R_2 = 12, R_3 = 14,$
 $a = 24, b = 28,$
 $c = 31, d = 28.$

Задача L-22.14.



Фам Тхай Ву
 $F = fN, T_1 = 60,$
 $T_2 = 116, P_1 = 40,$
 $P_2 = 30, P_3 = 38,$
 $Q = 22, G = 30,$
 $\alpha = 60^\circ, R_1 = 18,$
 $R_2 = 12, R_3 = 14,$
 $a = 24, b = 28,$
 $c = 31, d = 25.$

Задача L-22.15.



Ромеро Моника
 $F = fN, T_1 = 60,$
 $T_2 = 34, P_1 = 46,$
 $P_2 = 30, P_3 = 38,$
 $Q = 26, G = 30,$
 $\alpha = 60^\circ, R_1 = 30,$
 $R_2 = 12, R_3 = 14,$
 $a = 24, b = 29,$
 $c = 32, d = 28.$