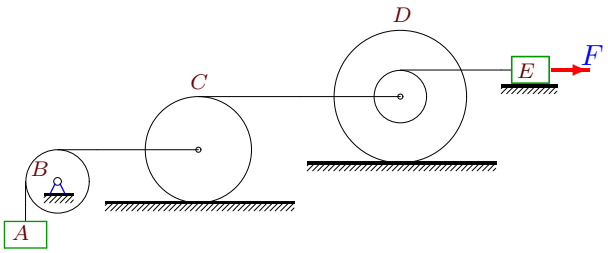
Кинетическая энергия системы. Приведенные массы

Механическая система, состоящая из пяти тел A, B, C, D и E, движется под действием внешних сил. Заданы радиусы цилиндров и блоков. Радиусы инерции даны для блоков, цилиндры считать однородными. Горизонтальный стержень, находящийся в зацеплении с блоками, считать невесомым. Массы даны в килограммах, радиусы — в сантиметрах. Вычислить приведенную массу системы μ в формуле $T = \mu v_A^2/2$, где v_A — скорость груза A.

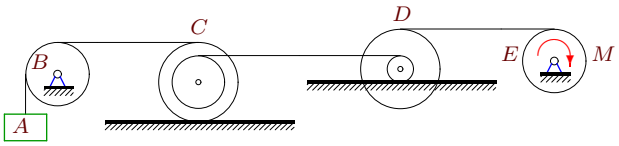
Кирсанов М.Н. **Решебник. Теоретическая механика**/Под ред. А. И. Кириллова.– М.:ФИЗМАТЛИТ, 2008.– 384 с. (с.257.)

Задача 33.1. 3



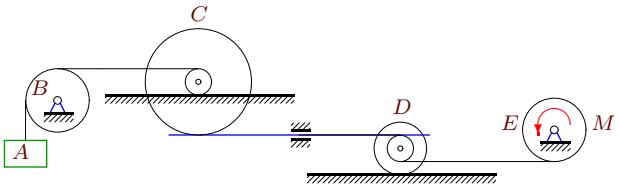
$R_C = 4$,
$R_D = 5$, $r_D = 2$, $i_D = 4$,
$m_A = 8$, $m_B = 8$,
$m_C = 8$, $m_D = 25$,
$m_E = 25$.

Задача 33.2. 3



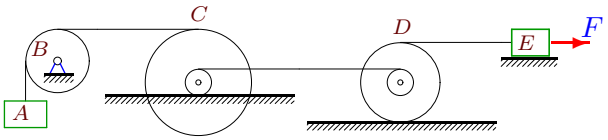
$R_C = 3$, $r_c = 2$, $i_C = 2$,
$R_D = 3$, $r_D = 1$, $i_D = 2$,
$m_A = 11$, $m_B = 4$,
$m_C = 252$, $m_D = 144$,
$m_E = 90$.

Задача 33.3. 3



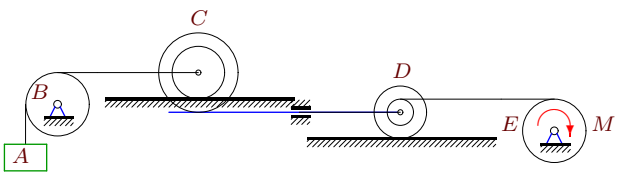
$R_C = 4$, $r_c = 1$, $i_C = 3$,
$R_D = 2$, $r_D = 1$, $i_D = 1$,
$m_A = 16$, $m_B = 12$,
$m_C = 8$, $m_D = 12$,
$m_E = 16$.

Задача 33.4. 3



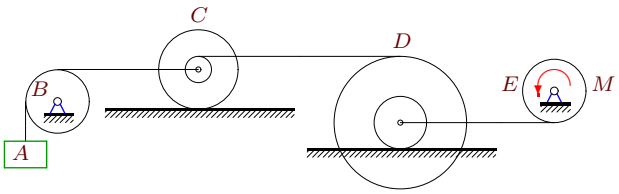
$R_C = 4$, $r_c = 1$, $i_C = 3$,
$R_D = 3$, $r_D = 1$, $i_D = 2$,
$m_A = 8$, $m_B = 4$,
$m_C = 20$, $m_D = 100$,
$m_E = 50$.

Задача 33.5. 3



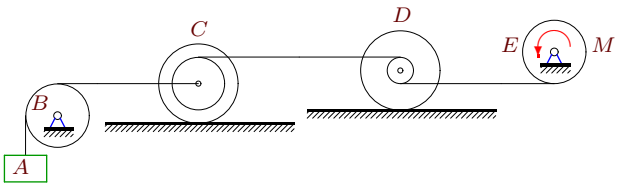
$R_C = 3$, $r_c = 2$, $i_C = 2$,
$R_D = 2$, $r_D = 1$, $i_D = 1$,
$m_A = 14$, $m_B = 2$,
$m_C = 4$, $m_D = 48$,
$m_E = 64$.

Задача 33.6. 3



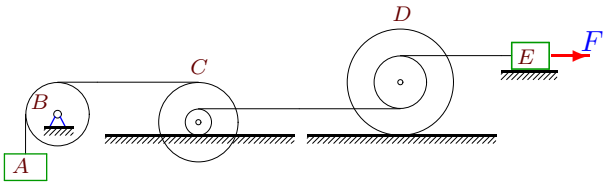
$R_C = 3,\ r_c = 1,\ i_C = 2,$
$R_D = 5,\ r_D = 2,\ i_D = 4,$
$m_A = 15,\ m_B = 6,$
$m_C = 63,\ m_D = 441,$
$m_E = 882.$

Задача 33.7. 3



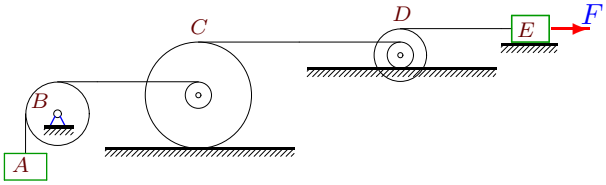
$R_C = 3,\ r_c = 2,\ i_C = 2,$
$R_D = 3,\ r_D = 1,\ i_D = 2,$
$m_A = 12,\ m_B = 10,$
$m_C = 54,\ m_D = 144,$
$m_E = 288.$

Задача 33.8. 3



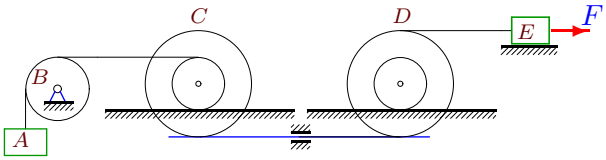
$R_C = 3,\ r_c = 1,\ i_C = 2,$
$R_D = 4,\ r_D = 2,\ i_D = 3,$
$m_A = 14,\ m_B = 4,$
$m_C = 96,\ m_D = 80,$
$m_E = 16.$

Задача 33.9. 3



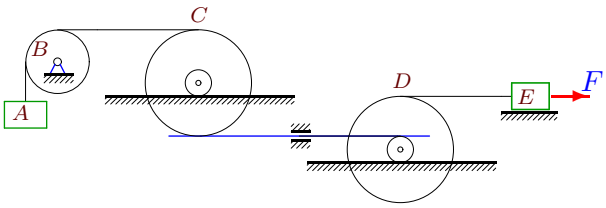
$R_C = 4,\ r_c = 1,\ i_C = 3,$
$R_D = 2,\ r_D = 1,\ i_D = 1,$
$m_A = 12,\ m_B = 2,$
$m_C = 8,\ m_D = 175,$
$m_E = 25.$

Задача 33.10. 3



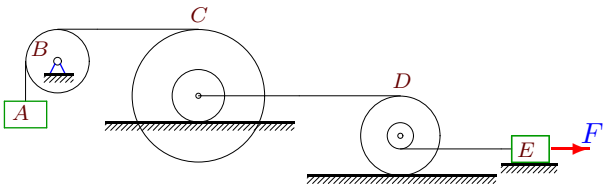
$R_C = 4,\ r_c = 2,\ i_C = 3,$
$R_D = 4,\ r_D = 2,\ i_D = 3,$
$m_A = 22,\ m_B = 10,$
$m_C = 112,\ m_D = 96,$
$m_E = 20.$

Задача 33.11. 3



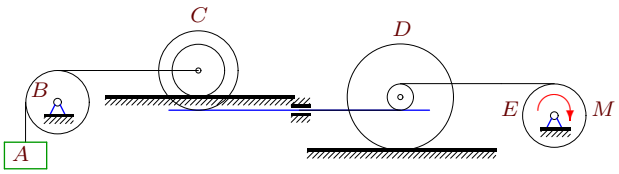
$R_C = 4,\ r_c = 1,\ i_C = 3,$
$R_D = 4,\ r_D = 1,\ i_D = 3,$
$m_A = 15,\ m_B = 8,$
$m_C = 20,\ m_D = 30,$
$m_E = 8.$

Задача 33.12. 3



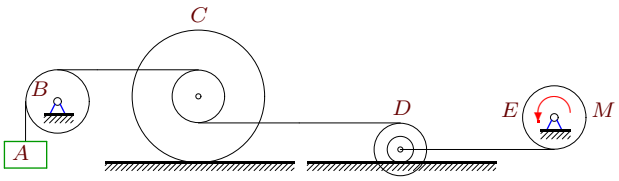
$R_C = 5$, $r_c = 2$, $i_C = 4$,
$R_D = 3$, $r_D = 1$, $i_D = 2$,
$m_A = 13$, $m_B = 10$,
$m_C = 343$, $m_D = 441$,
$m_E = 441$.

Задача 33.13. 3



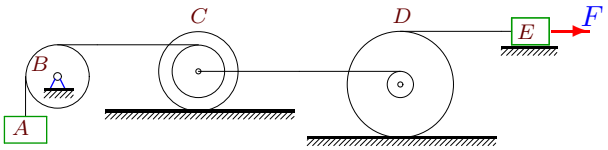
$R_C = 3$, $r_c = 2$, $i_C = 2$,
$R_D = 4$, $r_D = 1$, $i_D = 3$,
$m_A = 18$, $m_B = 8$,
$m_C = 7$, $m_D = 216$,
$m_E = 360$.

Задача 33.14. 3



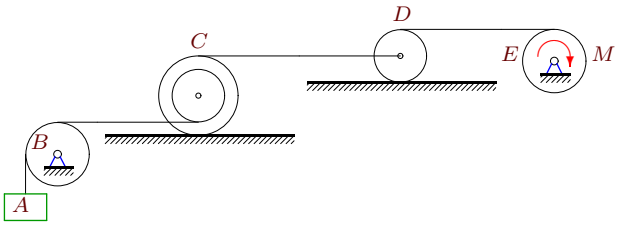
$R_C = 5$, $r_c = 2$, $i_C = 4$,
$R_D = 2$, $r_D = 1$, $i_D = 1$,
$m_A = 13$, $m_B = 12$,
$m_C = 196$, $m_D = 147$,
$m_E = 196$.

Задача 33.15. 3



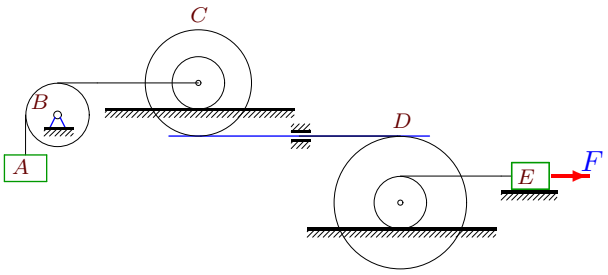
$R_C = 3$, $r_c = 2$, $i_C = 2$,
$R_D = 4$, $r_D = 1$, $i_D = 3$,
$m_A = 10$, $m_B = 6$,
$m_C = 200$, $m_D = 175$,
$m_E = 625$.

Задача 33.16. 3



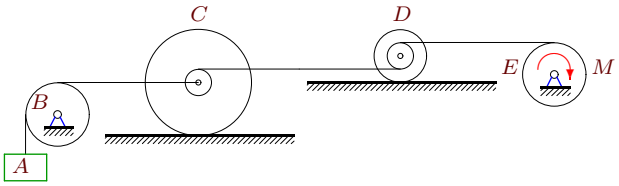
$R_C = 3$, $r_c = 2$, $i_C = 2$,
$R_D = 2$,
$m_A = 10$, $m_B = 2$,
$m_C = 8$, $m_D = 7$,
$m_E = 2$.

Задача 33.17. 3



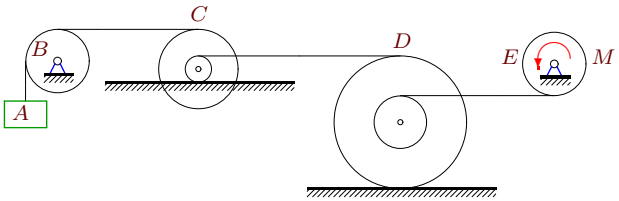
$R_C = 4$, $r_c = 2$, $i_C = 3$,
$R_D = 5$, $r_D = 2$, $i_D = 4$,
$m_A = 17$, $m_B = 8$,
$m_C = 20$, $m_D = 196$,
$m_E = 147$.

Задача 33.18. 3



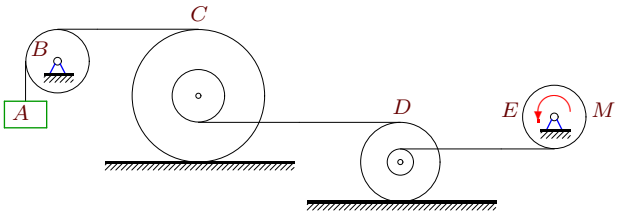
$R_C = 4,\ r_c = 1,\ i_C = 3,$
$R_D = 2,\ r_D = 1,\ i_D = 1,$
$m_A = 10,\ m_B = 12,$
$m_C = 64,\ m_D = 16,$
$m_E = 32.$

Задача 33.19. 3



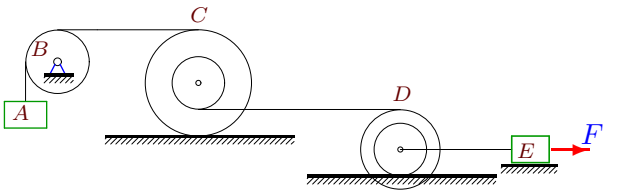
$R_C = 3,\ r_c = 1,\ i_C = 2,$
$R_D = 5,\ r_D = 2,\ i_D = 4,$
$m_A = 10,\ m_B = 8,$
$m_C = 96,\ m_D = 400,$
$m_E = 800.$

Задача 33.20. 3



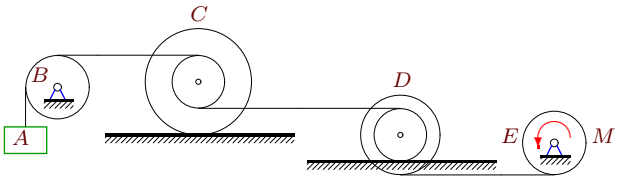
$R_C = 5,\ r_c = 2,\ i_C = 4,$
$R_D = 3,\ r_D = 1,\ i_D = 2,$
$m_A = 5,\ m_B = 10,$
$m_C = 100,\ m_D = 400,$
$m_E = 150.$

Задача 33.21. 3



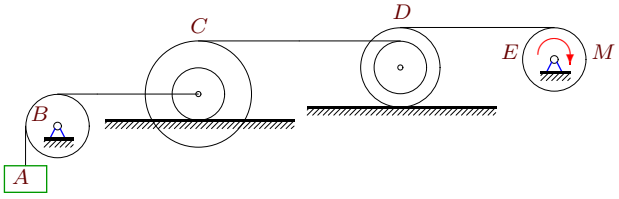
$R_C = 4,\ r_c = 2,\ i_C = 3,$
$R_D = 3,\ r_D = 2,\ i_D = 2,$
$m_A = 12,\ m_B = 2,$
$m_C = 384,\ m_D = 250,$
$m_E = 100.$

Задача 33.22. 3



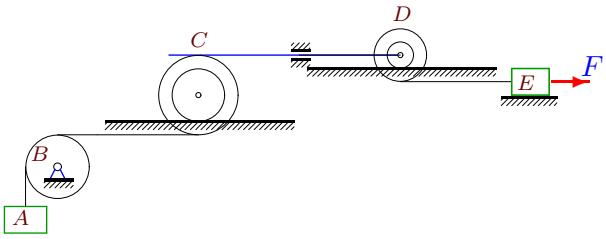
$R_C = 4,\ r_c = 2,\ i_C = 3,$
$R_D = 3,\ r_D = 2,\ i_D = 2,$
$m_A = 17,\ m_B = 2,$
$m_C = 180,\ m_D = 72,$
$m_E = 288.$

Задача 33.23. 3



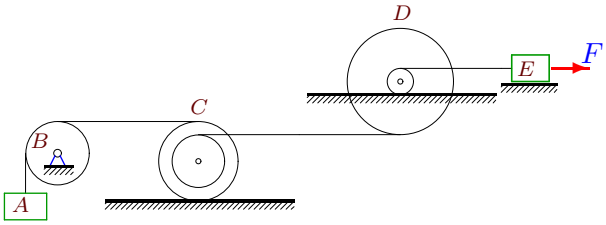
$R_C = 4,\ r_c = 2,\ i_C = 3,$
$R_D = 3,\ r_D = 2,\ i_D = 2,$
$m_A = 11,\ m_B = 2,$
$m_C = 24,\ m_D = 125,$
$m_E = 50.$

Задача 33.24. 3



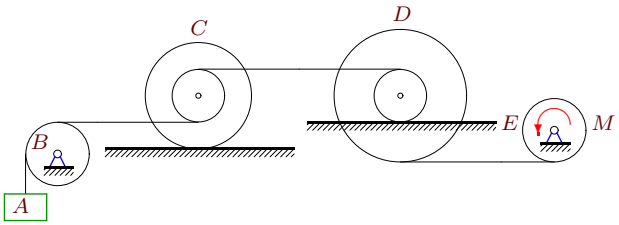
$R_C = 3$, $r_c = 2$, $i_C = 2$,
$R_D = 2$, $r_D = 1$, $i_D = 1$,
$m_A = 19$, $m_B = 12$,
$m_C = 5$, $m_D = 4$,
$m_E = 3$.

Задача 33.25. 3



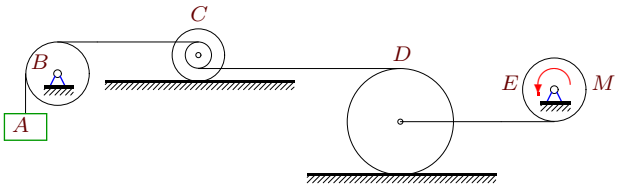
$R_C = 3$, $r_c = 2$, $i_C = 2$,
$R_D = 4$, $r_D = 1$, $i_D = 3$,
$m_A = 15$, $m_B = 8$,
$m_C = 252$, $m_D = 162$,
$m_E = 405$.

Задача 33.26. 3



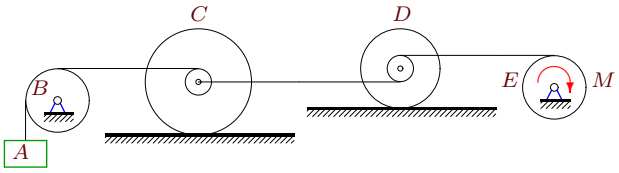
$R_C = 4$, $r_c = 2$, $i_C = 3$,
$R_D = 5$, $r_D = 2$, $i_D = 4$,
$m_A = 19$, $m_B = 8$,
$m_C = 28$, $m_D = 24$,
$m_E = 160$.

Задача 33.27. 3



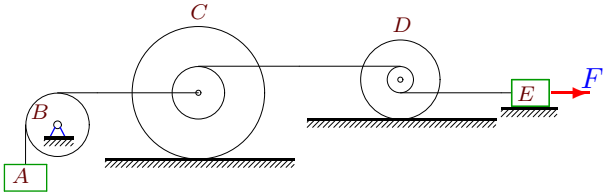
$R_C = 2$, $r_c = 1$, $i_C = 1$,
$R_D = 4$,
$m_A = 9$, $m_B = 10$,
$m_C = 36$, $m_D = 72$,
$m_E = 144$.

Задача 33.28. 3



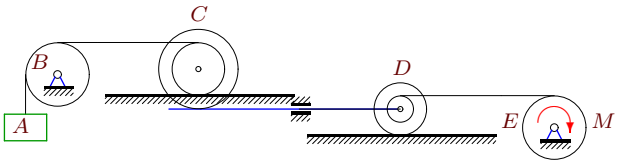
$R_C = 4$, $r_c = 1$, $i_C = 3$,
$R_D = 3$, $r_D = 1$, $i_D = 2$,
$m_A = 11$, $m_B = 4$,
$m_C = 5$, $m_D = 100$,
$m_E = 150$.

Задача 33.29. 3



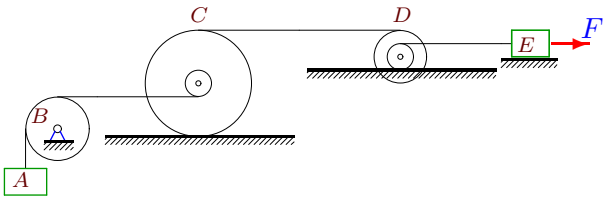
$R_C = 5$, $r_c = 2$, $i_C = 4$,
$R_D = 3$, $r_D = 1$, $i_D = 2$,
$m_A = 14$, $m_B = 4$,
$m_C = 200$, $m_D = 400$,
$m_E = 100$.

Задача 33.30. 3



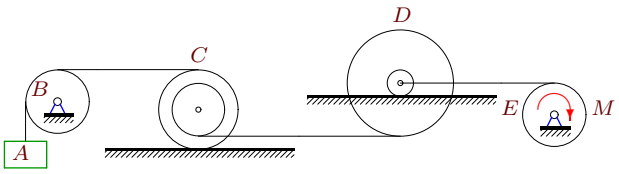
$R_C = 3,\ r_c = 2,\ i_C = 2,$
$R_D = 2,\ r_D = 1,\ i_D = 1,$
$m_A = 15,\ m_B = 2,$
$m_C = 8,\ m_D = 192,$
$m_E = 128.$

Задача 33.31. 3



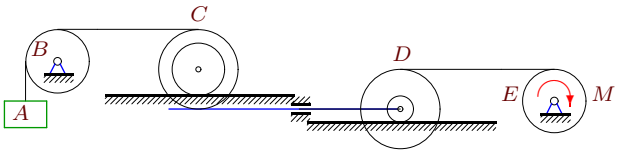
$R_C = 4,\ r_c = 1,\ i_C = 3,$
$R_D = 2,\ r_D = 1,\ i_D = 1,$
$m_A = 11,\ m_B = 2,$
$m_C = 54,\ m_D = 81,$
$m_E = 81.$

Задача 33.32. 3



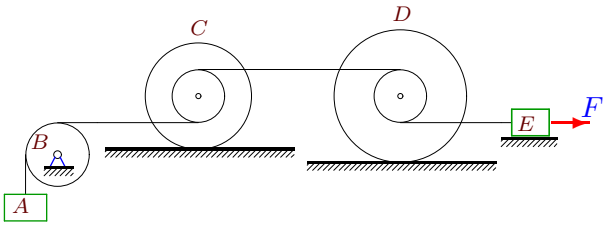
$R_C = 3,\ r_c = 2,\ i_C = 2,$
$R_D = 4,\ r_D = 1,\ i_D = 3,$
$m_A = 16,\ m_B = 8,$
$m_C = 288,\ m_D = 162,$
$m_E = 648.$

Задача 33.33. 3



$R_C = 3,\ r_c = 2,\ i_C = 2,$
$R_D = 3,\ r_D = 1,\ i_D = 2,$
$m_A = 19,\ m_B = 4,$
$m_C = 175,\ m_D = 30,$
$m_E = 250.$

Задача 33.34. 3



$R_C = 4,\ r_c = 2,\ i_C = 3,$
$R_D = 5,\ r_D = 2,\ i_D = 4,$
$m_A = 14,\ m_B = 6,$
$m_C = 28,\ m_D = 49,$
$m_E = 245.$

33.3

Кинетическая энергия системы. Приведенные массы

	μ_A	μ_B	μ_C	μ_D	μ_E	μ
1	8	4	12	164	196	384
2	11	2	91	125	125	354
3	16	6	20	15	2	59
4	8	2	8	13	18	49
5	14	1	8	15	18	56
6	15	3	91	320	64	493
7	12	5	78	325	100	520
8	14	2	30	125	36	207
9	12	1	8	224	144	389
10	22	5	91	78	45	241
11	15	4	8	27	18	72
12	13	5	140	13	4	175
13	18	4	14	150	125	311
14	13	6	164	6	2	191
15	10	3	104	63	576	756
16	10	1	104	378	144	637
17	17	4	65	80	48	214
18	10	6	100	125	225	466
19	10	4	30	41	49	134
20	5	5	41	13	3	67
21	12	1	150	5	1	169
22	17	1	125	4	1	148
23	11	1	78	585	324	999
24	19	6	40	200	75	340
25	15	4	91	125	125	360
26	19	4	175	270	405	873
27	9	5	20	3	2	39
28	11	2	5	208	192	418
29	14	2	328	637	49	1030
30	15	1	4	15	9	44
31	11	1	150	128	256	546
32	16	4	104	5	1	130
33	19	2	56	6	80	163
34	14	3	175	369	405	966