

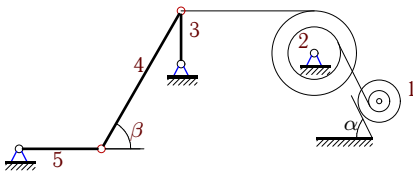
Кинетическая энергия системы. Приведенные массы

Механическая система, состоящая из пяти тел, движется под действием внешних сил. Заданы радиусы цилиндров, блоков и длины стержней. Радиусы инерции даны для блоков, цилиндры и стержни считать однородными. Массы даны в килограммах, радиусы — в сантиметрах. Стержни, направления которых в данный момент не указаны, считать вертикальными и горизонтальными. Вычислить приведенную массу системы μ в формуле $T = \mu v_1^2/2$, где v_1 — скорость груза 1 или центра цилиндра (блока) 1.

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

Задача D-33.1.

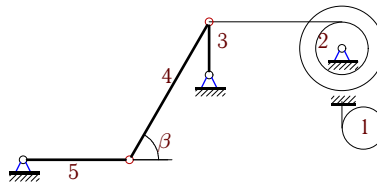
||



$$R_1 = 2, r_1 = 1, i_1 = 1, R_2 = 4, r_2 = 2, i_2 = 2, m_1 = 8, m_2 = 48, m_3 = 6, m_4 = 9, m_5 = 27, \beta = 60^\circ.$$

Задача D-33.2.

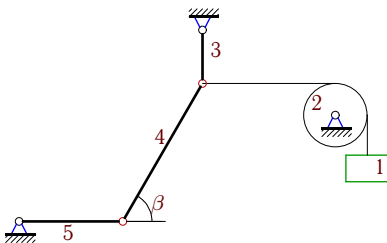
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$$R_2 = 4, r_2 = 2, i_2 = 2, m_1 = 2, m_2 = 20, m_3 = 3, m_4 = 9, m_5 = 9, \beta = 60^\circ.$$

Задача D-33.3.

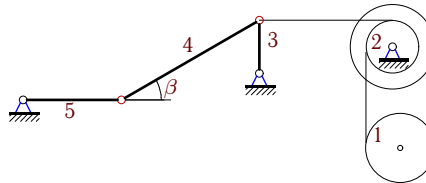
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$$m_1 = 18, m_2 = 12, m_3 = 3, m_4 = 27, m_5 = 9, \beta = 60^\circ.$$

Задача D-33.4.

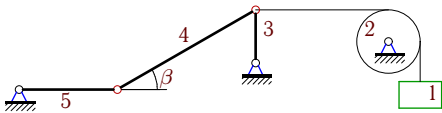
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$$R_1 = 2.5, R_2 = 3, r_2 = 2, i_2 = 2, m_1 = m_2 = 2, m_3 = 3, m_4 = 9, m_5 = 9, \beta = 30^\circ.$$

Задача D-33.5.

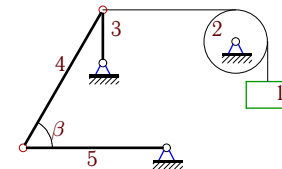
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$$m_1 = 13, m_2 = 6, m_3 = 9, m_4 = 27, m_5 = 27, \beta = 30^\circ.$$

Задача D-33.6.

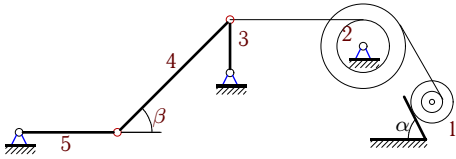
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$$m_1 = 14, m_2 = 12, m_3 = 3, m_4 = 9, m_5 = 9, \beta = 60^\circ.$$

Задача D-33.7.

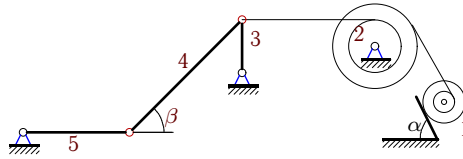
11



$R_1 = 2, r_1 = 1, i_1 = 1, R_2 = 3, r_2 = 2, i_2 = 2, m_1 = 12, m_2 = 24, m_3 = 9, m_4 = 9, m_5 = 9, \beta = 45^\circ.$

Задача D-33.8.

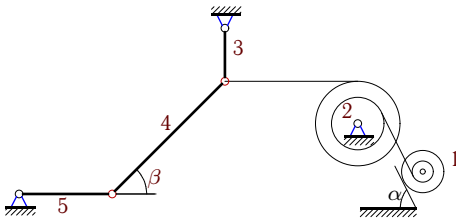
11



$R_1 = 2, r_1 = 1, i_1 = 1, R_2 = 3, r_2 = 2, i_2 = 3, m_1 = m_2 = 16, m_3 = 12, m_4 = 9, m_5 = 9, \beta = 45^\circ.$

Задача D-33.9.

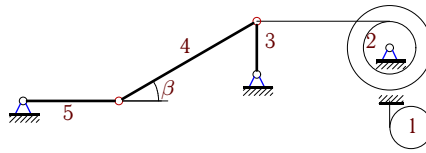
11



$R_1 = 2, r_1 = 1, i_1 = 1, R_2 = 4, r_2 = 2, i_2 = 2, m_1 = 4, m_2 = 80, m_3 = 3, m_4 = 18, m_5 = 9, \beta = 45^\circ.$

Задача D-33.10.

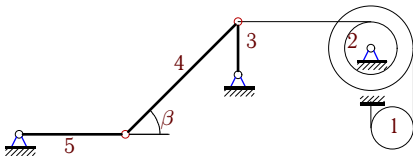
11



$R_2 = 4, r_2 = 2, i_2 = 3, m_1 = 2, m_2 = 20, m_3 = 3, m_4 = 9, m_5 = 9, \beta = 30^\circ.$

Задача D-33.11.

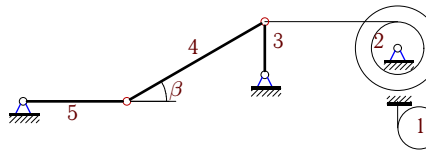
11



$R_2 = 4, r_2 = 2, i_2 = 3, m_1 = 4, m_2 = 8, m_3 = 6, m_4 = 9, m_5 = 18, \beta = 45^\circ.$

Задача D-33.12.

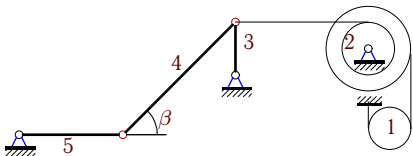
11



$R_2 = 4, r_2 = 2, i_2 = 3, m_1 = 4, m_2 = 24, m_3 = 6, m_4 = 27, m_5 = 9, \beta = 30^\circ.$

Задача D-33.13.

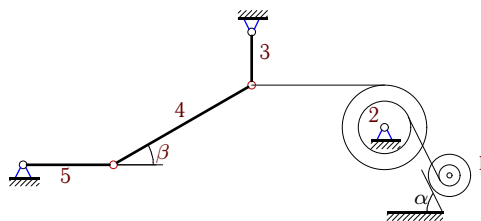
11



$R_2 = 4, r_2 = 2, i_2 = 2, m_1 = 2, m_2 = 20, m_3 = 3, m_4 = 9, m_5 = 9, \beta = 45^\circ.$

Задача D-33.14.

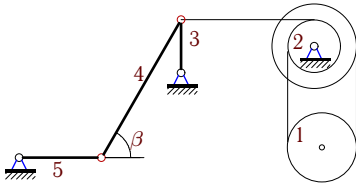
11



$R_1 = 2, r_1 = 1, i_1 = 2, R_2 = 4, r_2 = 2, i_2 = 2, m_1 = 4, m_2 = 32, m_3 = 3, m_4 = 9, m_5 = 18, \beta = 30^\circ.$

Задача D-33.15.

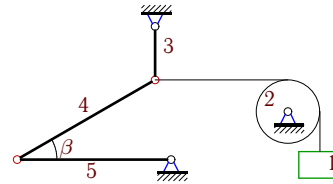
11



$R_1 = 4.5, R_2 = 5, r_2 = 4, i_2 = 3, m_1 = 2, m_2 = 1, m_3 = 3, m_4 = 9, m_5 = 9, \beta = 60^\circ.$

Задача D-33.16.

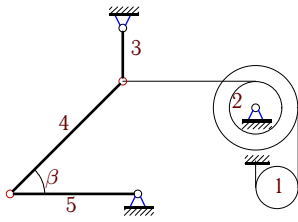
11



$m_1 = 16, m_2 = 2, m_3 = 9, m_4 = 9, m_5 = 9, \beta = 30^\circ.$

Задача D-33.17.

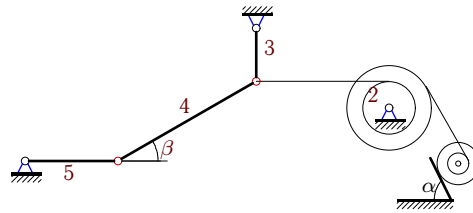
11



$R_2 = 4, r_2 = 2, i_2 = 3, m_1 = 6, m_2 = 8, m_3 = 9, m_4 = 18, m_5 = 18, \beta = 45^\circ.$

Задача D-33.18.

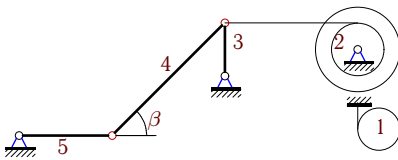
11



$R_1 = 2, r_1 = 1, i_1 = 2, R_2 = 3, r_2 = 2, i_2 = 2, m_1 = 4, m_2 = 24, m_3 = 3, m_4 = 9, m_5 = 9, \beta = 30^\circ.$

Задача D-33.19.

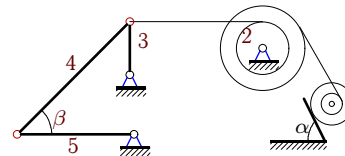
11



$R_2 = 4, r_2 = 2, i_2 = 3, m_1 = 2, m_2 = 4, m_3 = 3, m_4 = 9, m_5 = 9, \beta = 45^\circ.$

Задача D-33.20.

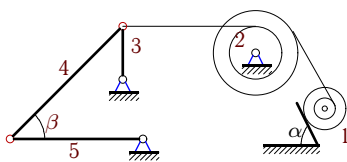
11



$R_1 = 2, r_1 = 1, i_1 = 1, R_2 = 3, r_2 = 2, i_2 = 2, m_1 = 4, m_2 = 24, m_3 = 3, m_4 = 9, m_5 = 9, \beta = 45^\circ.$

Задача D-33.21.

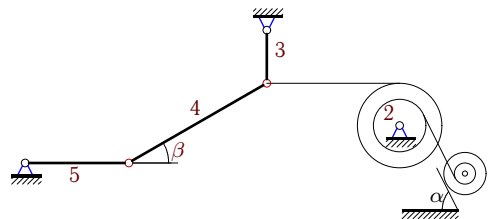
11



$R_1 = 2, r_1 = 1, i_1 = 1, R_2 = 3, r_2 = 2, i_2 = 3, m_1 = 4, m_2 = 16, m_3 = 3, m_4 = 9, m_5 = 9, \beta = 45^\circ.$

Задача D-33.22.

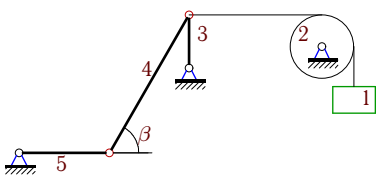
11



$R_1 = 2, r_1 = 1, i_1 = 2, R_2 = 4, r_2 = 2, i_2 = 3, m_1 = 4, m_2 = 48, m_3 = 3, m_4 = 9, m_5 = 27, \beta = 30^\circ.$

Задача D-33.23.

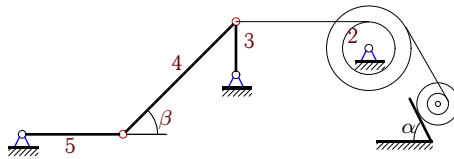
11



$$m_1 = 14, m_2 = 4, m_3 = 3, m_4 = 9, m_5 = 18, \beta = 60^\circ.$$

Задача D-33.24.

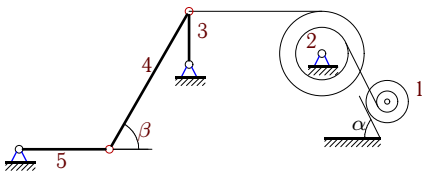
11



$$R_1 = 2, r_1 = 1, i_1 = 1, R_2 = 3, r_2 = 2, i_2 = 3, m_1 = 4, m_2 = 20, m_3 = 3, m_4 = 27, m_5 = 9, \beta = 45^\circ.$$

Задача D-33.25.

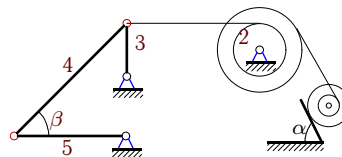
11



$$R_1 = 2, r_1 = 1, i_1 = 1, R_2 = 4, r_2 = 2, i_2 = 2, m_1 = 12, m_2 = 80, m_3 = 9, m_4 = 9, m_5 = 9, \beta = 60^\circ.$$

Задача D-33.26.

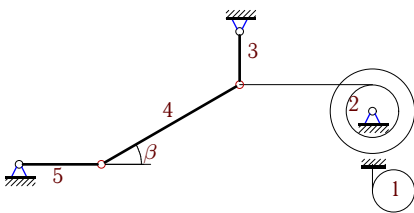
11



$$R_1 = 2, r_1 = 1, i_1 = 1, R_2 = 3, r_2 = 2, i_2 = 3, m_1 = 4, m_2 = 20, m_3 = 3, m_4 = 9, m_5 = 9, \beta = 45^\circ.$$

Задача D-33.27.

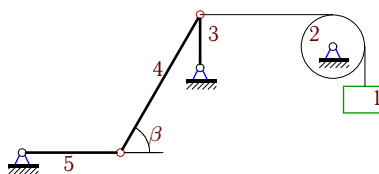
11



$$R_2 = 4, r_2 = 2, i_2 = 2, m_1 = 10, m_2 = 24, m_3 = 15, m_4 = 9, m_5 = 9, \beta = 30^\circ.$$

Задача D-33.28.

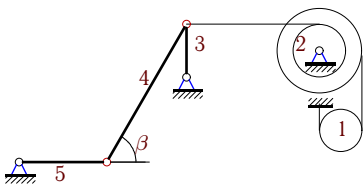
11



$$m_1 = 15, m_2 = 2, m_3 = 15, m_4 = 9, m_5 = 9, \beta = 60^\circ.$$

Задача D-33.29.

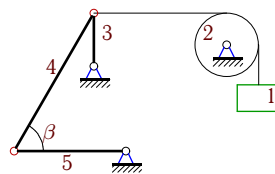
11



$$R_2 = 4, r_2 = 2, i_2 = 3, m_1 = 2, m_2 = 8, m_3 = 3, m_4 = 9, m_5 = 18, \beta = 60^\circ.$$

Задача D-33.30.

11



$$m_1 = 4, m_2 = 6, m_3 = 3, m_4 = 9, m_5 = 27, \beta = 60^\circ.$$

D-33 Ответы.**Кинетическая энергия системы. Приведенные массы** 04.11.2012

№	μ_1	μ_2	μ_3	μ_4	μ_5	μ
1	10	12	2	4	3	31
2	3	20	1	4	1	29
3	18	6	1	12	1	38
4	27	32	16	192	144	411
5	13	3	3	36	27	82
6	14	6	1	4	1	26
7	15	24	3	6	3	51
8	20	36	4	6	3	69
9	5	20	1	12	3	41
10	3	45	1	12	9	70
11	6	18	2	6	6	38
12	6	54	2	36	9	107
13	3	20	1	6	3	33
14	8	8	1	12	18	47
15	83	36	64	256	64	503
16	16	1	3	12	9	41
17	9	18	3	12	6	48
18	8	24	1	12	9	54
19	3	9	1	6	3	22
20	5	24	1	6	3	39
21	5	36	1	6	3	51
22	8	27	1	12	27	75
23	14	2	1	4	2	23
24	5	45	1	18	3	72
25	15	20	3	4	1	43
26	5	45	1	6	3	60
27	15	24	5	12	9	65
28	15	1	5	4	1	26
29	3	18	1	4	2	28
30	4	3	1	4	3	15

D-33 файл o33d11D