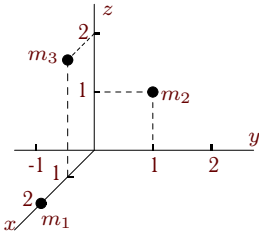


Теорема об изменении момента количества движения системы

Твердое тело вращается вокруг оси z по закону $\varphi = \varphi(t)$. Даны моменты инерции тела (кгм^2) и координаты (в метрах) трех точек с массами $m_1 = 1$ кг, $m_2 = 2$ кг и $m_3 = 3$ кг. Найти момент равнодействующей сил, приложенных к телу относительно начала координат при $t = 0$.

Задача D36.1.

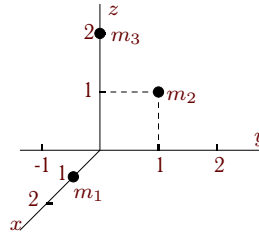
2



$$\begin{aligned}\varphi &= 3te^{t/2}, \\ J_{xz} &= 8, \\ J_{yz} &= 16, \\ J_z &= 12.\end{aligned}$$

Задача D36.2.

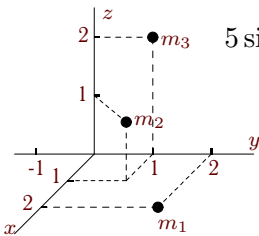
2



$$\begin{aligned}\varphi &= 3 \cos(t), \\ J_{xz} &= 1, \\ J_{yz} &= 10, \\ J_z &= 9.\end{aligned}$$

Задача D36.3.

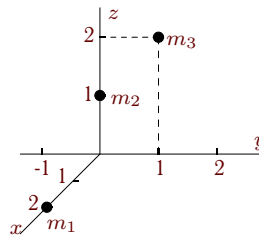
2



$$\begin{aligned}\varphi &= 5 \sin(t)/(1 - t/2), \\ J_{xz} &= 10, \\ J_{yz} &= 4, \\ J_z &= 6.\end{aligned}$$

Задача D36.4.

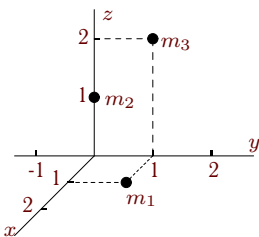
2



$$\begin{aligned}\varphi &= 3te^{t/2}, \\ J_{xz} &= 2, \\ J_{yz} &= 4, \\ J_z &= 4.\end{aligned}$$

Задача D36.5.

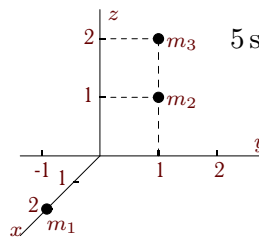
2



$$\begin{aligned}\varphi &= 4t \sin(t/2), \\ J_{xz} &= 12, \\ J_{yz} &= 9, \\ J_z &= 11.\end{aligned}$$

Задача D36.6.

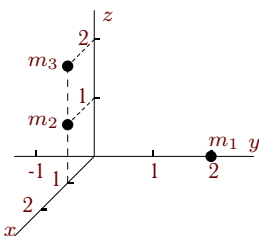
2



$$\begin{aligned}\varphi &= 5 \sin(t)/(1 - t/2), \\ J_{xz} &= 4, \\ J_{yz} &= -2, \\ J_z &= 3.\end{aligned}$$

Задача D36.7.

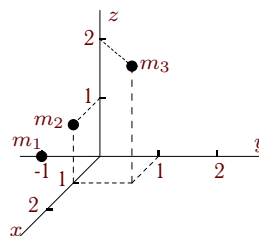
2



$$\begin{aligned}\varphi &= 3e^t/(t + 1), \\ J_{xz} &= 0, \\ J_{yz} &= 16, \\ J_z &= 7.\end{aligned}$$

Задача D36.8.

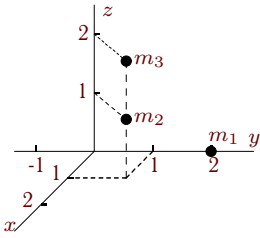
2



$$\begin{aligned}\varphi &= 4 \ln(1 + t), \\ J_{xz} &= -2, \\ J_{yz} &= 6, \\ J_z &= 3.\end{aligned}$$

Задача D36.9.

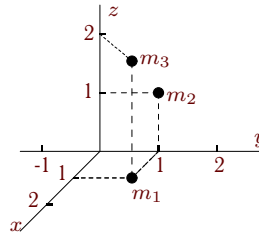
2



$$\begin{aligned} \varphi &= t\sqrt{t+1}, \\ J_{xz} &= -6, \\ J_{yz} &= 0, \\ J_z &= 2. \end{aligned}$$

Задача D36.10.

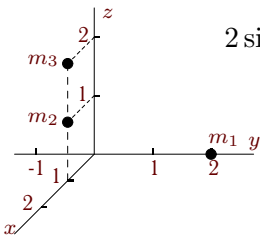
2



$$\begin{aligned} \varphi &= 4e^t/(t^2+1), \\ J_{xz} &= 0, \\ J_{yz} &= 4, \\ J_z &= 2. \end{aligned}$$

Задача D36.11.

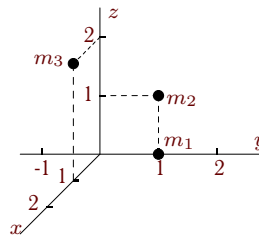
2



$$\begin{aligned} \varphi &= 2 \sin(t)/(1-t/2), \\ J_{xz} &= -6, \\ J_{yz} &= 8, \\ J_z &= 7. \end{aligned}$$

Задача D36.12.

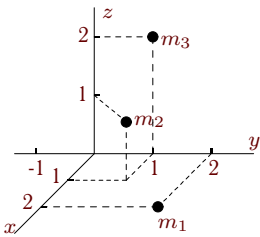
2



$$\begin{aligned} \varphi &= 5t \sin(2t), \\ J_{xz} &= -2, \\ J_{yz} &= 6, \\ J_z &= 2. \end{aligned}$$

Задача D36.13.

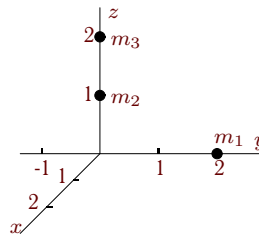
2



$$\begin{aligned} \varphi &= 2 \ln(1+t), \\ J_{xz} &= 6, \\ J_{yz} &= 3, \\ J_z &= 1. \end{aligned}$$

Задача D36.14.

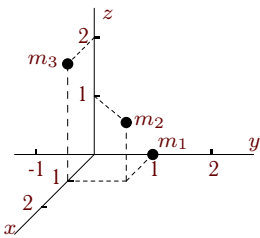
2



$$\begin{aligned} \varphi &= te^{2t}, \\ J_{xz} &= 12, \\ J_{yz} &= 16, \\ J_z &= 17. \end{aligned}$$

Задача D36.15.

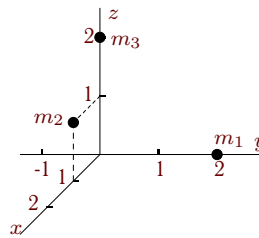
2



$$\begin{aligned} \varphi &= 5 \cos(t), \\ J_{xz} &= -4, \\ J_{yz} &= 6, \\ J_z &= 11. \end{aligned}$$

Задача D36.16.

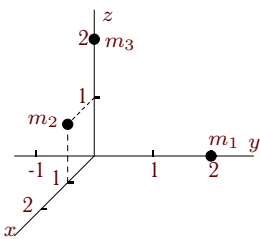
2



$$\begin{aligned} \varphi &= 5t(1+t/2), \\ J_{xz} &= 2, \\ J_{yz} &= 8, \\ J_z &= 2. \end{aligned}$$

Задача D36.17.

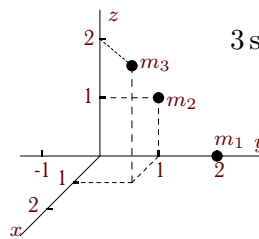
2



$$\begin{aligned} \varphi &= 2t \sin(t/2), \\ J_{xz} &= 12, \\ J_{yz} &= 18, \\ J_z &= 15. \end{aligned}$$

Задача D36.18.

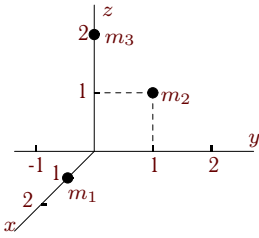
2



$$\begin{aligned} \varphi &= 3 \sin(t)/(1-t/2), \\ J_{xz} &= 2, \\ J_{yz} &= 0, \\ J_z &= 2. \end{aligned}$$

Задача D36.19.

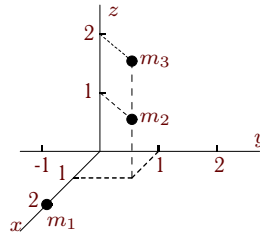
2



$$\begin{aligned} \varphi &= 3t(1 + t/2), \\ J_{xz} &= 2, \\ J_{yz} &= 3, \\ J_z &= 11. \end{aligned}$$

Задача D36.20.

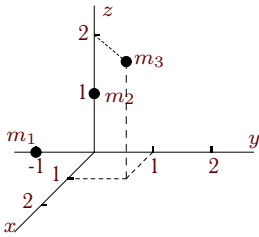
2



$$\begin{aligned} \varphi &= 4te^{2t}, \\ J_{xz} &= -4, \\ J_{yz} &= 0, \\ J_z &= 5. \end{aligned}$$

Задача D36.21.

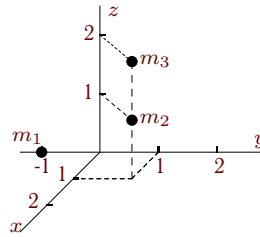
2



$$\begin{aligned} \varphi &= 4t^2 \cos(t), \\ J_{xz} &= -5, \\ J_{yz} &= 6, \\ J_z &= 5. \end{aligned}$$

Задача D36.22.

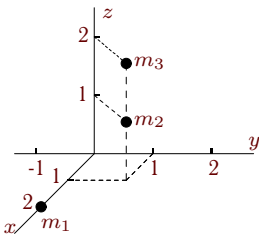
2



$$\begin{aligned} \varphi &= e^t/(t + 1), \\ J_{xz} &= -4, \\ J_{yz} &= 0, \\ J_z &= 8. \end{aligned}$$

Задача D36.23.

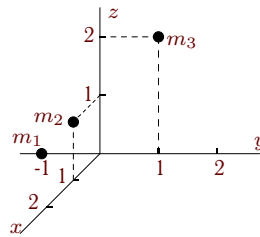
2



$$\begin{aligned} \varphi &= te^{t/2}, \\ J_{xz} &= 9, \\ J_{yz} &= 12, \\ J_z &= 6. \end{aligned}$$

Задача D36.24.

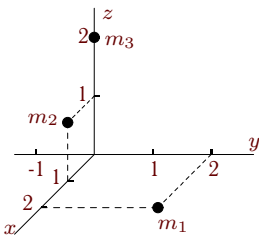
2



$$\begin{aligned} \varphi &= 2t\sqrt{t + 1}, \\ J_{xz} &= 2, \\ J_{yz} &= 2, \\ J_z &= 2. \end{aligned}$$

Задача D36.25.

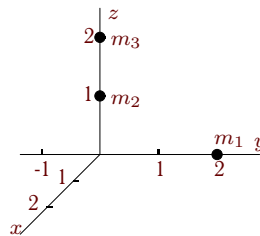
2



$$\begin{aligned} \varphi &= 4t\sqrt{t + 1}, \\ J_{xz} &= 1, \\ J_{yz} &= 4, \\ J_z &= 2. \end{aligned}$$

Задача D36.26.

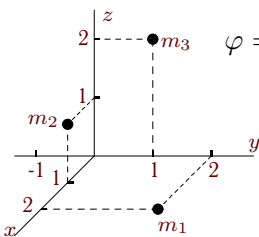
2



$$\begin{aligned} \varphi &= 3\ln(1 + t), \\ J_{xz} &= 1, \\ J_{yz} &= 4, \\ J_z &= 4. \end{aligned}$$

Задача D36.27.

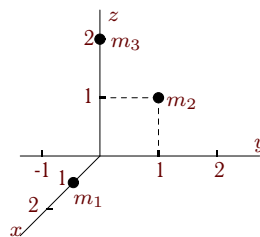
2



$$\begin{aligned} \varphi &= 5\sqrt{2t + 1}/(t + 1), \\ J_{xz} &= 6, \\ J_{yz} &= 10, \\ J_z &= 3. \end{aligned}$$

Задача D36.28.

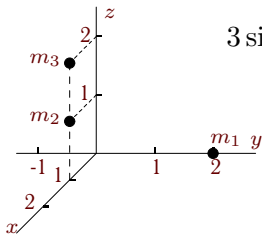
2



$$\begin{aligned} \varphi &= 5e^t/(t^2 + 1), \\ J_{xz} &= 2, \\ J_{yz} &= 2, \\ J_z &= 1. \end{aligned}$$

Задача D36.29.

2



$$\varphi = \frac{3 \sin(t)}{(1 - t/2)},$$

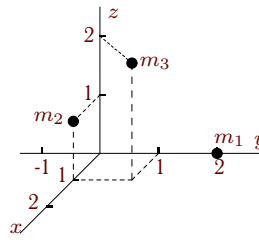
$$J_{xz} = 0,$$

$$J_{yz} = 8,$$

$$J_z = 5.$$

Задача D36.30.

2



$$\varphi = 4e^t/(t + 1),$$

$$J_{xz} = 4,$$

$$J_{yz} = 6,$$

$$J_z = 2.$$

D36 Ответы.

Теорема об изменении момента количества движения системы

16.09.2012

№	J_{xz}	J_{yz}	J_z	M_x	M_y	M_z	ε	M_0
1	14	18	21	-42	-54	63	3	93
2	1	12	12	3	36	-36	-3	51
3	12	12	21	-60	-60	105	5	135
4	2	10	11	-6	-30	33	3	45
5	12	15	16	-48	-60	64	4	100
6	4	6	12	-20	-30	60	5	70
7	8	16	16	-24	-48	48	3	72
8	6	12	12	24	48	-48	-4	72
9	2	8	16	-2	-8	16	1	18
10	6	12	12	24	48	-48	-4	72
11	2	8	16	-4	-16	32	2	36
12	4	8	8	-80	-160	160	20	240
13	8	11	16	16	22	-32	-2	42
14	12	16	21	-48	-64	84	4	116
15	4	8	19	20	40	-95	-5	105
16	4	8	8	-20	-40	40	5	60
17	14	18	21	-28	-36	42	2	62
18	8	8	14	-24	-24	42	3	54
19	2	5	14	-6	-15	42	3	45
20	4	8	19	-64	-128	304	16	336
21	1	12	12	-8	-96	96	8	136
22	4	8	19	-4	-8	19	1	21
23	17	20	20	-17	-20	20	1	33
24	4	8	8	-8	-16	16	2	24
25	3	4	12	-12	-16	48	4	52
26	1	4	8	3	12	-24	-3	27
27	8	16	16	40	80	-80	-5	120
28	2	4	4	10	20	-20	-5	30
29	8	8	14	-24	-24	42	3	54
30	12	12	14	-48	-48	56	4	88