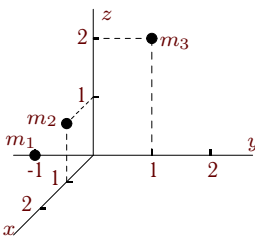


## Теорема об изменении момента количества движения системы

Твердое тело вращается вокруг оси  $z$  по закону  $\varphi = \varphi(t)$ . Даны моменты инерции тела ( $\text{кгм}^2$ ) 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.** 4



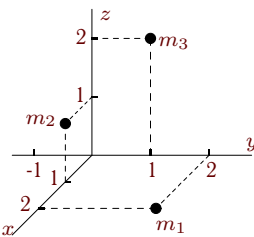
$$\varphi = 3e^t/(t+1),$$

$$J_{xz} = 0,$$

$$J_{yz} = 0,$$

$$J_z = 3.$$

**Задача D36.2.** 4



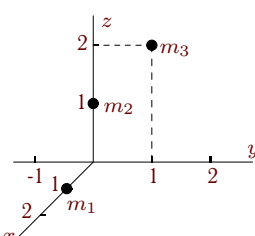
$$\varphi = 2e^t/(t^2+1),$$

$$J_{xz} = 6,$$

$$J_{yz} = 10,$$

$$J_z = 3.$$

**Задача D36.3.** 4



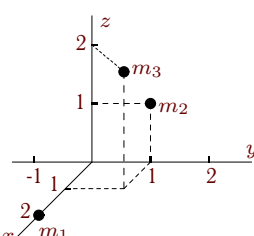
$$\varphi = 4t^2 \cos(t),$$

$$J_{xz} = 14,$$

$$J_{yz} = 12,$$

$$J_z = 17.$$

**Задача D36.4.** 4



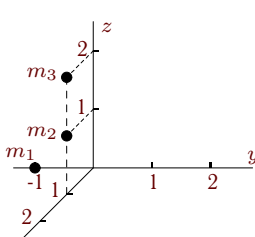
$$\varphi = e^t/(t^2+1),$$

$$J_{xz} = 2,$$

$$J_{yz} = 3,$$

$$J_z = 4.$$

**Задача D36.5.** 4



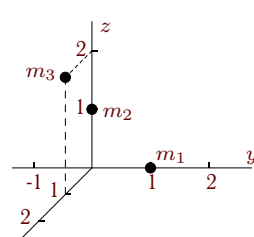
$$\varphi = 2t \ln(1+t/2),$$

$$J_{xz} = 0,$$

$$J_{yz} = 16,$$

$$J_z = 10.$$

**Задача D36.6.** 4



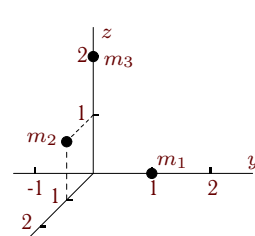
$$\varphi = 3t^2 \cos(t),$$

$$J_{xz} = 8,$$

$$J_{yz} = 18,$$

$$J_z = 17.$$

**Задача D36.7.** 4



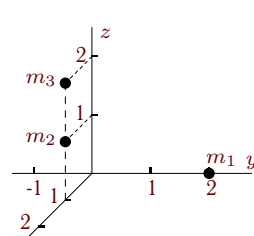
$$\varphi = 2t \ln(1+t/2),$$

$$J_{xz} = 10,$$

$$J_{yz} = 15,$$

$$J_z = 13.$$

**Задача D36.8.** 4



$$\varphi = t \sin(t/2),$$

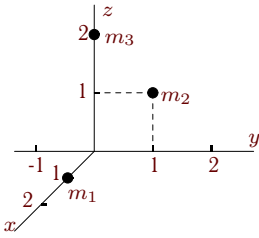
$$J_{xz} = -7,$$

$$J_{yz} = 12,$$

$$J_z = 3.$$

**Задача D36.9.**

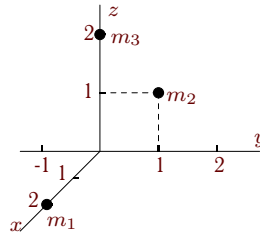
4



$$\begin{aligned} \varphi &= 3 \ln(1+t), \\ J_{xz} &= 12, \\ J_{yz} &= 14, \\ J_z &= 18. \end{aligned}$$

**Задача D36.10.**

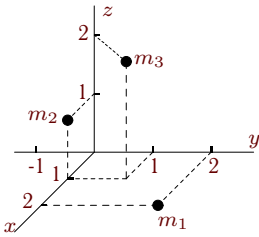
4



$$\begin{aligned} \varphi &= 2 \cos(t), \\ J_{xz} &= 2, \\ J_{yz} &= 3, \\ J_z &= 8. \end{aligned}$$

**Задача D36.11.**

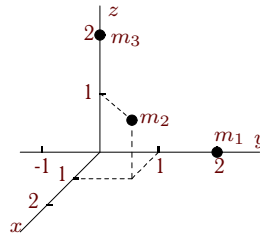
4



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

**Задача D36.12.**

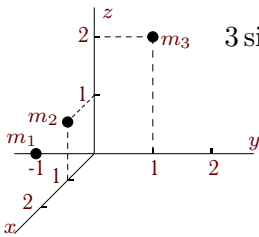
4



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

**Задача D36.13.**

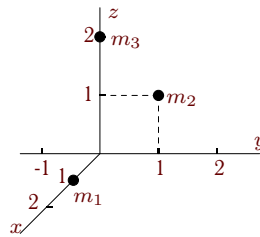
4



$$\begin{aligned} \varphi &= 3 \sin(t)/(1-t/2), \\ J_{xz} &= 0, \\ J_{yz} &= 4, \\ J_z &= 5. \end{aligned}$$

**Задача D36.14.**

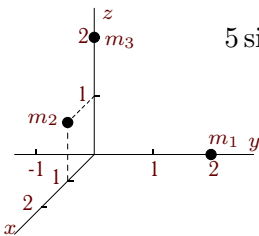
4



$$\begin{aligned} \varphi &= 3 \ln(1+t), \\ J_{xz} &= 17, \\ J_{yz} &= 18, \\ J_z &= 17. \end{aligned}$$

**Задача D36.15.**

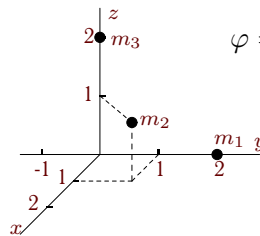
4



$$\begin{aligned} \varphi &= 5 \sin(t)/(1-t/2), \\ J_{xz} &= 4, \\ J_{yz} &= 12, \\ J_z &= 6. \end{aligned}$$

**Задача D36.16.**

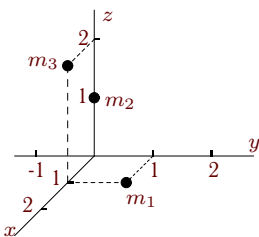
4



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

**Задача D36.17.**

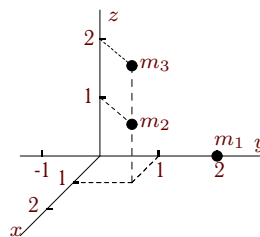
4



$$\begin{aligned} \varphi &= 3t \sin(t/2), \\ J_{xz} &= -3, \\ J_{yz} &= 4, \\ J_z &= 7. \end{aligned}$$

**Задача D36.18.**

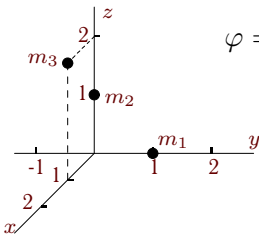
4



$$\begin{aligned} \varphi &= 3te^{2t}, \\ J_{xz} &= 4, \\ J_{yz} &= 7, \\ J_z &= 2. \end{aligned}$$

**Задача D36.19.**

4



$$\varphi = 4\sqrt{2t+1}/(t+1),$$

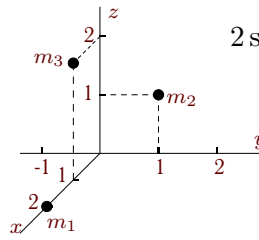
$$J_{xz} = -2,$$

$$J_{yz} = 4,$$

$$J_z = 3.$$

**Задача D36.20.**

4



$$\varphi = 2\sin(t)/(1-t/2),$$

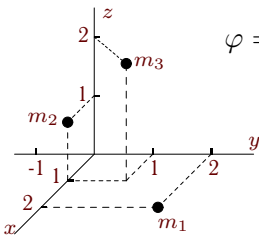
$$J_{xz} = 8,$$

$$J_{yz} = 16,$$

$$J_z = 12.$$

**Задача D36.21.**

4



$$\varphi = 3\sqrt{2t+1}/(t+1),$$

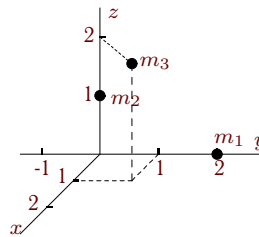
$$J_{xz} = 8,$$

$$J_{yz} = 26,$$

$$J_z = 16.$$

**Задача D36.22.**

4



$$\varphi = 3t \ln(1+t/2),$$

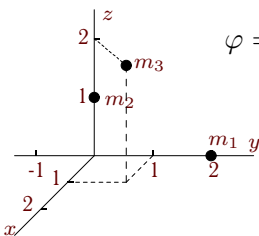
$$J_{xz} = 2,$$

$$J_{yz} = 3,$$

$$J_z = 2.$$

**Задача D36.23.**

4



$$\varphi = 4\sqrt{2t+1}/(t+1),$$

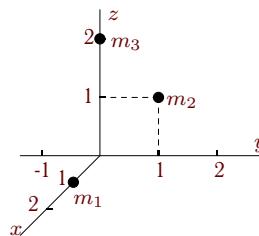
$$J_{xz} = 2,$$

$$J_{yz} = 2,$$

$$J_z = 4.$$

**Задача D36.24.**

4



$$\varphi = 2te^{2t},$$

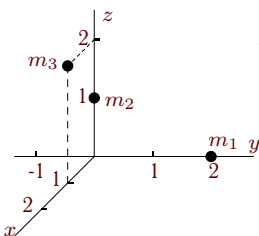
$$J_{xz} = 8,$$

$$J_{yz} = 14,$$

$$J_z = 13.$$

**Задача D36.25.**

4



$$\varphi = 3t \ln(1+t/2),$$

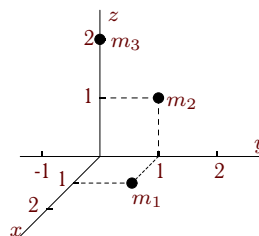
$$J_{xz} = 6,$$

$$J_{yz} = 12,$$

$$J_z = 7.$$

**Задача D36.26.**

4



$$\varphi = 3t^2 \cos(t),$$

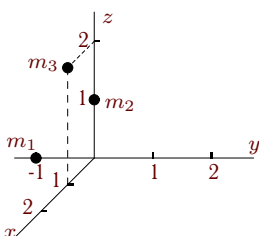
$$J_{xz} = 2,$$

$$J_{yz} = 1,$$

$$J_z = 2.$$

**Задача D36.27.**

4



$$\varphi = 3t/(1-t/2),$$

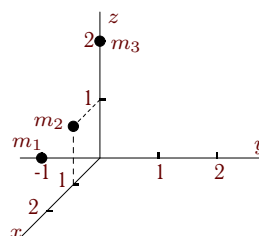
$$J_{xz} = 6,$$

$$J_{yz} = 16,$$

$$J_z = 17.$$

**Задача D36.28.**

4



$$\varphi = 4te^{t/2},$$

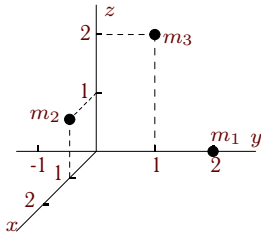
$$J_{xz} = 1,$$

$$J_{yz} = 4,$$

$$J_z = 9.$$

**Задача D36.29.**

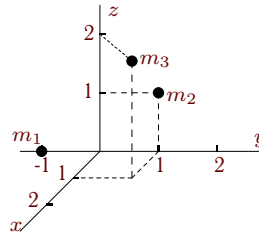
4



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

**Задача D36.30.**

4



$$\begin{aligned} \varphi &= 5t^2 \cos(t), \\ J_{xz} &= 0, \\ J_{yz} &= 4, \\ J_z &= 3. \end{aligned}$$

**D36 Ответы.**

**Теорема об изменении момента количества движения системы**

16.09.2012

№	$J_{xz}$	$J_{yz}$	$J_z$	$M_x$	$M_y$	$M_z$	$\varepsilon$	$M_0$
1	2	6	9	-6	-18	27	3	33
2	8	16	16	16	32	-32	-2	48
3	14	18	21	-112	-144	168	8	248
4	8	11	16	8	11	-16	-1	21
5	8	16	16	-16	-32	32	2	48
6	14	18	21	-84	-108	126	6	186
7	12	15	16	-24	-30	32	2	50
8	1	12	12	-1	-12	12	1	17
9	12	16	21	36	48	-63	-3	87
10	2	5	14	4	10	-28	-2	30
11	12	16	21	-12	-16	21	1	29
12	4	6	12	-8	-12	24	2	28
13	2	10	11	-6	-30	33	3	45
14	17	20	20	51	60	-60	-3	99
15	6	12	12	-30	-60	60	5	90
16	8	8	14	16	16	-28	-2	36
17	3	4	12	-9	-12	36	3	39
18	12	15	16	-144	-180	192	12	300
19	4	4	7	16	16	-28	-4	36
20	14	18	21	-28	-36	42	2	62
21	16	32	32	48	96	-96	-3	144
22	8	9	12	-24	-27	36	3	51
23	8	8	14	32	32	-56	-4	72
24	8	16	16	-64	-128	128	8	192
25	12	12	14	-36	-36	42	3	66
26	2	3	6	-12	-18	36	6	42
27	12	16	21	-36	-48	63	3	87
28	3	4	12	-12	-16	48	4	52
29	5	10	10	-15	-30	30	3	45
30	6	12	12	-60	-120	120	10	180