

Декартовы координаты. Пространственная траектория

Точка движется по закону $x = x(t)$, $y = y(t)$, $z = z(t)$. Для момента времени $t = 0$ найти скорость и ускорение точки. Координаты x , y и z даны в метрах, время t — в секундах.

Кирсанов М.Н. **Решebник. Теоретическая механика**/Под ред. А. И. Кириллова.– М.: ФИЗМАТЛИТ, 2008. — 384 с. (с.137.)

Задача K2.1.

2

$$\begin{aligned}x &= 8 \ln(1 + t), \\y &= \cos(2t), \\z &= 32\sqrt{t+1}/(1+t/2).\end{aligned}$$

Задача K2.2.

2

$$\begin{aligned}x &= 9e^{t/2} \operatorname{sh}(t), \\y &= 8\sqrt{t+1} \operatorname{sh}(t), \\z &= 12\sqrt{t+1} \sin(t).\end{aligned}$$

Задача K2.3.

2

$$\begin{aligned}x &= 4 \ln(t)/(t^2 + 1), \\y &= 4 \ln(1 + t), \\z &= 7\sqrt{t+1} \sin(t).\end{aligned}$$

Задача K2.4.

2

$$\begin{aligned}x &= 9 \ln(t)/(1 - t), \\y &= 4t^2 \cos(t), \\z &= 6 \sin(t^2).\end{aligned}$$

Задача K2.5.

2

$$\begin{aligned}x &= 4e^t/(t^2 + 1), \\y &= 8\sqrt{t+1} \cos(t/2), \\z &= 7 \ln(t)/(1 - t).\end{aligned}$$

Задача K2.6.

2

$$\begin{aligned}x &= 9 \ln(t)/(t^2 + 1), \\y &= 4 \sin(t^2), \\z &= 6t^2 \cos(t).\end{aligned}$$

Задача K2.7.

2

$$\begin{aligned}x &= 2e^{t/2} \operatorname{sh}(t), \\y &= 12\sqrt{t+1} \cos(t/2), \\z &= 9te^{t/2}.\end{aligned}$$

Задача K2.8.

2

$$\begin{aligned}x &= 2t(1 + t/2), \\y &= 3t(e^t - t), \\z &= 6t \operatorname{ch}(t).\end{aligned}$$

Задача K2.9.

2

$$\begin{aligned}x &= 4te^{t/2}, \\y &= 0.5 \cos(2t), \\z &= 2t \ln(1 + t).\end{aligned}$$

Задача K2.10.

2

$$\begin{aligned}x &= 4\sqrt{t+1} \cos(t/2), \\y &= 3t, \\z &= 6t/\cos(t).\end{aligned}$$

Задача K2.11.

2

$$\begin{aligned}x &= \ln(t)/(1 - t), \\y &= 2te^{t/2}, \\z &= 4\sqrt{t+1} \cos(t/2).\end{aligned}$$

Задача K2.12.

2

$$\begin{aligned}x &= 9 \ln(1 + t), \\y &= 8t \cos(t)/(t^2 + 1), \\z &= 6 \operatorname{tg}(2t).\end{aligned}$$

Задача K2.13.

2

$$\begin{aligned}x &= 4 \sin(t)/(1 + t/2), \\y &= 2t(1 + t/2), \\z &= 4 \ln(t)/(t^2 + 1).\end{aligned}$$

Задача K2.14.

2

$$\begin{aligned}x &= 3e^{t/2} \operatorname{sh}(t), \\y &= 3 \sin(2t), \\z &= 6t(e^t - t).\end{aligned}$$

Задача K2.15.

2

$$\begin{aligned}x &= 8 \ln(1+t), \\y &= 9t(e^t - t), \\z &= 6 \operatorname{tg}(2t).\end{aligned}$$

Задача K2.16.

2

$$\begin{aligned}x &= 18\sqrt{t+1} \cos(t/2), \\y &= 8 \sin(t)/(1+t/2), \\z &= 12t(1+t/2).\end{aligned}$$

Задача K2.17.

2

$$\begin{aligned}x &= 4e^{t/2} \operatorname{sh}(t), \\y &= 4 \ln(t)/(1-t), \\z &= 7 \ln(1+t).\end{aligned}$$

Задача K2.18.

2

$$\begin{aligned}x &= 2t(1+t/2), \\y &= 4 \cos(t)/(t^2-1), \\z &= \cos(2t).\end{aligned}$$

Задача K2.19.

2

$$\begin{aligned}x &= 2 \sin(t)/(1+t/2), \\y &= 3t \cos(t)/(t^2+1), \\z &= 6 \operatorname{tg}(t).\end{aligned}$$

Задача K2.20.

2

$$\begin{aligned}x &= 8e^{t/2} \operatorname{sh}(t), \\y &= 9t \cos(t), \\z &= 12t \cos(2t).\end{aligned}$$

Задача K2.21.

2

$$\begin{aligned}x &= 6 \ln(1+t), \\y &= 3 \ln(t)/(t^2+1), \\z &= 6\sqrt{t+1} \sin(t).\end{aligned}$$

Задача K2.22.

2

$$\begin{aligned}x &= 9 \ln(t)/(1-t), \\y &= 8 \cos(t), \\z &= 6 \sin(t^2).\end{aligned}$$

Задача K2.23.

2

$$\begin{aligned}x &= 5e^{t/2} \operatorname{sh}(t), \\y &= 2 \ln(t)/(1-t), \\z &= 14\sqrt{t+1} \operatorname{sh}(t).\end{aligned}$$

Задача K2.24.

2

$$\begin{aligned}x &= 2e^{t/2} \operatorname{sh}(t), \\y &= \ln(1+t), \\z &= 2\sqrt{t+1} \sin(t).\end{aligned}$$

Задача K2.25.

2

$$\begin{aligned}x &= 4\sqrt{t+1} \cos(t/2), \\y &= 5 \ln(t^2+1), \\z &= 11e^t/(t+1).\end{aligned}$$

Задача K2.26.

2

$$\begin{aligned}x &= 12 \ln(1+t), \\y &= \sin(t)/(1+t/2), \\z &= 12\sqrt{t+1} \operatorname{sh}(t).\end{aligned}$$

Задача K2.27.

2

$$\begin{aligned}x &= 6 \ln(t)/(1-t), \\y &= 6\sqrt{t+1} \operatorname{sh}(t), \\z &= 7e^{t/2} \operatorname{sh}(t).\end{aligned}$$

Задача K2.28.

2

$$\begin{aligned}x &= 9(\cos(t) - t/2)t, \\y &= 8(1-t)^t/(t+1), \\z &= 12t \cos(t)/(t^2+1).\end{aligned}$$

Задача K2.29.

2

$$\begin{aligned}x &= 4e^t/(t^2+1), \\y &= 4 \operatorname{tg}(2t), \\z &= 8 \sin(t)/(t^2-1).\end{aligned}$$

Задача K2.30.

2

$$\begin{aligned}x &= 2t(1+t/2), \\y &= 3 \sin(t)/(t^2-1), \\z &= 6t \cos(t).\end{aligned}$$

К2 Ответы.**Декартовы координаты. Пространственная траектория** 13.08.2012

№	v	a
1	8	12
2	17	17
3	9	9
4	9	17
5	9	9
6	9	17
7	11	11
8	7	2
9	4	6
10	7	2
11	3	3
12	17	9
13	6	6
14	9	3
15	17	8
16	17	17
17	9	9
18	2	6
19	7	2
20	17	8
21	9	9
22	9	17
23	15	15
24	3	3
25	2	15
26	17	17
27	11	11
28	17	9
29	12	4
30	7	2

К2 файл о2k2A