Декартовы координаты. Пространственая траектория

Точка движется по закону $x = x(t), y = y(t),\ z = z(t)$. Определить скорость, ускорение точки и радиус кривизны траектории при $t = t_1$ (x, y и z даны в см, t и t_1 — в с).

Задача 2.1. 7

$x = 2\arcsin(t/7),$
$y = 6\ln(4t + 2),$
$z = \frac{1}{2}\sin 4t + 7t,\ t_1 = 0.6.$

Задача 2.2. 7

$x = 4\arcsin(t/8),$
$y = \dfrac{11}{3t + 4},$
$z = \frac{1}{2}\sin^2 8t - 8t,\ t_1 = 0.7.$

Задача 2.3. 7

$x = 9\sqrt{3t + 9},$
$y = \frac{1}{2}\sin 6t + 9t,$
$z = 2t^2 + 9t + 3,\ t_1 = 0.8.$

Задача 2.4. 7

$x = 5e^{(t^2)},$
$y = 3\arcsin(t/5),$
$z = 4\mathrm{tg}(t/3),\ t_1 = 0.4.$

Задача 2.5. 7

$x = 4(t + 1)^{3/10},$
$y = 3t^2 + 3t + 2,$
$z = \dfrac{6}{3t + 4},\ t_1 = 0.2.$

Задача 2.6. 7

$x = 2t^2 + 8t + 3,$
$y = 9t + \frac{1}{2}\cos^2 6t,$
$z = \frac{1}{2}\sin^2 6t - 8t,\ t_1 = 0.7.$

Задача 2.7. 7

$x = 3t + \frac{1}{2}\cos^2 6t,$
$y = 2\sqrt{3t + 2},$
$z = 3\arcsin(t/2),\ t_1 = 0.1.$

Задача 2.8. 7

$x = 9(t + 1)^{1/5},$
$y = 9t + \frac{1}{2}\cos^2 6t,$
$z = 18e^{t/3},\ t_1 = 0.7.$

Задача 2.9. 7

$x = \frac{1}{2}\sin^2 4t - 7t,$
$y = \frac{1}{2}\sin 4t + 7t,$
$z = 6\ln(4t + 2),\ t_1 = 0.6.$

Задача 2.10. 7

$x = 6\ln(4t + 2),$
$y = \frac{1}{2}\sin 4t + 7t,$
$z = t^2 + 7t + 4,\ t_1 = 0.6.$

Задача 2.11. 7

$x = \frac{1}{2}\sin^2 4t - 2t,$
$y = 12e^{t/2},$
$z = 3(t + 1)^{1/10},\ t_1 = 0.1.$

Задача 2.12. 7

$x = 19e^{t/4},$
$y = 5\mathrm{tg}(t/4),$
$z = 8\ln(2t + 2),\ t_1 = 0.8.$

Задача 2.13. 7

$x = \frac{1}{2}\sin 4t + 5t,$
$y = 5e^{(t^2)},$
$z = 2\arcsin(t/5),\ t_1 = 0.4.$

Задача 2.14. 7

$x = 18e^{t/2},$
$y = 8e^{(t^2)},$
$z = 2\arcsin(t/8),\ t_1 = 0.7.$

Задача 2.15. 7

$x = 2\arcsin(t/6),$
$y = \dfrac{9}{t + 2},$
$z = \frac{1}{2}\sin 4t + 6t,\ t_1 = 0.5.$

Задача 2.16.   7

$x = 5e^{(t^2)},$
$y = \frac{1}{2}\sin^2 4t - 5t,$
$z = 5\sqrt{4t+5},\ t_1 = 0.4.$

Задача 2.17.   7

$x = 8e^{(t^2)},$
$y = 7\ln(2t+2),$
$z = 8\sqrt{2t+8},\ t_1 = 0.7.$

Задача 2.18.   7

$x = \dfrac{7}{2t+3},$
$y = 5(t+1)^{1/5},$
$z = 4\mathrm{tg}(t/3),\ t_1 = 0.3.$

Задача 2.19.   7

$x = \dfrac{9}{t+2},$
$y = t^2 + 6t + 4,$
$z = 5\ln(4t+2),\ t_1 = 0.5.$

Задача 2.20.   7

$x = 18e^{t/4},$
$y = \frac{1}{2}\sin^2 8t - 8t,$
$z = 8e^{(t^2)},\ t_1 = 0.7.$

Задача 2.21.   7

$x = t^2 + 6t + 4,$
$y = 2\arcsin(t/6),$
$z = 6e^{(t^2)},\ t_1 = 0.5.$

Задача 2.22.   7

$x = 7e^{(t^2)},$
$y = 2\arcsin(t/7),$
$z = 7\sqrt{4t+7},\ t_1 = 0.6.$

Задача 2.23.   7

$x = 9t + \frac{1}{4}\cos^2 8t,$
$y = 2\arcsin(t/8),$
$z = 8\sqrt{4t+8},\ t_1 = 0.7.$

Задача 2.24.   7

$x = 3\mathrm{tg}(t/2),$
$y = t^2 + 3t + 4,$
$z = 2\ln(4t+2),\ t_1 = 0.2.$

Задача 2.25.   7

$x = \dfrac{6}{2t+3},$
$y = 4\mathrm{tg}(t/3),$
$z = 2\ln(3t+2),\ t_1 = 0.2.$

Задача 2.26.   7

$x = 8(t+1)^{1/10},$
$y = 7e^{(t^2)},$
$z = 2\arcsin(t/7),\ t_1 = 0.6.$

Задача 2.27.   7

$x = 3\arcsin(t/11),$
$y = 21e^{t/3},$
$z = 12t + \frac{1}{2}\cos^2 6t,\ t_1 = 1.$

Задача 2.28.   7

$x = \frac{1}{2}\sin 6t + 4t,$
$y = 14e^{t/3},$
$z = 3\ln(3t+2),\ t_1 = 0.3.$

Задача 2.29.   7

$x = 2e^{(t^2)},$
$y = 5\mathrm{tg}(t/4),$
$z = 2\sqrt{2t+2},\ t_1 = 0.1.$

Задача 2.30.   7

$x = 4\arcsin(t/11),$
$y = 11\sqrt{2t+11},$
$z = \frac{1}{2}\sin^2 8t - 11t,\ t_1 = 1.$

Задача 2.31.   7

$x = 10t + \frac{1}{2}\cos^2 6t,$
$y = 19e^{t/3},$
$z = 9\sqrt{3t+9},\ t_1 = 0.8.$

Задача 2.32.   7

$x = 17e^{t/4},$
$y = \frac{1}{2}\sin^2 8t - 7t,$
$z = 8(t+1)^{3/10},\ t_1 = 0.6.$

Задача 2.33.   7

$x = 5\mathrm{tg}(t/4),$
$y = \frac{1}{2}\sin 8t + 11t,$
$z = 3t^2 + 11t + 2,\ t_1 = 1.$

Декартовы координаты. Пространственая траектория

№	v_x	v_y	v_z	v	a_x	a_y	a_z	a	a_τ	a_n	R
1	0.29	5.45	5.53	7.77	0.00	−4.96	−5.40	7.33	−7.32	0.38	157.612
2	0.50	−0.89	−11.92	11.96	0.01	0.87	12.99	13.02	−13.01	0.56	255.449
3	4.00	9.26	12.20	15.83	−0.53	17.93	4.00	18.38	13.44	12.54	19.993
4	4.69	0.60	1.36	4.92	15.49	0.01	0.12	15.49	14.80	4.56	5.313
5	1.06	4.20	−0.85	4.41	−0.62	6.00	1.11	6.13	5.35	3.00	6.491
6	10.80	6.44	−5.44	13.70	4.00	18.69	−18.69	26.74	19.36	18.45	10.171
7	0.20	1.98	1.50	2.49	−13.04	−1.29	0.04	13.11	−2.07	12.94	0.480
8	1.18	6.44	7.58	10.01	−0.55	18.69	2.53	18.87	13.87	12.80	7.828
9	−8.99	5.53	5.45	11.88	1.40	−5.40	−4.96	7.47	−5.85	4.64	30.416
10	5.45	5.53	8.20	11.29	−4.96	−5.40	2.00	7.60	−3.59	6.70	19.026
11	−0.57	6.31	0.28	6.34	11.15	3.15	−0.23	11.59	2.13	11.39	3.528
12	5.80	1.30	4.44	7.42	1.45	0.13	−2.47	2.87	−0.32	2.85	19.345
13	4.94	4.69	0.40	6.83	−8.00	15.49	0.01	17.43	4.86	16.74	2.784
14	12.77	18.28	0.25	22.30	6.39	51.71	0.00	52.10	46.05	24.39	20.398
15	0.33	−1.44	5.17	5.38	0.00	1.15	−7.27	7.37	−7.30	0.96	30.086
16	4.69	−5.12	3.89	7.96	15.49	−15.97	−1.18	22.28	18.82	11.92	5.316
17	18.28	4.12	2.61	18.92	51.71	−2.42	−0.28	51.77	49.40	15.48	23.126
18	−1.08	0.81	1.35	1.91	1.20	−0.50	0.09	1.30	−0.83	1.01	3.617
19	−1.44	7.00	5.00	8.72	1.15	2.00	−5.00	5.51	−1.45	5.31	14.320
20	5.36	−11.92	18.28	22.47	1.34	12.99	51.71	53.34	35.50	39.80	12.686
21	7.00	0.33	7.70	10.41	2.00	0.00	23.11	23.20	18.44	14.07	7.707
22	12.04	0.29	4.57	12.88	34.51	0.00	−0.97	34.53	31.92	13.17	12.599
23	10.96	0.25	4.87	11.99	−6.50	0.00	−0.90	6.56	−6.30	1.82	79.100
24	1.52	3.40	2.86	4.69	0.15	2.00	−4.08	4.55	−0.99	4.44	4.960
25	−1.04	1.34	2.31	2.86	1.22	0.06	−2.66	2.93	−2.56	1.42	5.759
26	0.52	12.04	0.29	12.05	−0.29	34.51	0.00	34.52	34.46	1.97	73.679
27	0.27	9.77	13.61	16.76	0.00	3.26	−30.38	30.55	−22.78	20.36	13.786
28	3.32	5.16	3.10	6.87	−17.53	1.72	−3.21	17.90	−8.62	15.69	3.011
29	0.40	1.25	1.35	1.88	4.12	0.02	−0.61	4.17	0.46	4.14	0.856
30	0.37	3.05	−12.15	12.53	0.00	−0.23	−61.29	61.29	59.36	15.25	10.302
31	10.52	8.27	4.00	13.97	35.45	2.76	−0.53	35.56	28.19	21.68	9.000
32	4.94	−7.70	1.73	9.31	1.23	−63.02	−0.76	63.04	52.64	34.68	2.497
33	1.33	10.42	17.00	19.98	0.17	−31.66	6.00	32.22	−11.39	30.14	13.247