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 саснтиметрах, t и t_1 — в секундах).

Задача К2.1. 8

$x = 4\mathrm{tg}(t/3)$,
$y = 8\sqrt{3t + 8}$,
$z = 3\arcsin(t/8),\ t_1 = 0.7.$

Задача К2.2. 8

$x = 18e^{t/4}$,
$y = \frac{1}{2}\sin^2 8t - 8t$,
$z = 7\ln(2t + 2),\ t_1 = 0.7.$

Задача К2.3. 8

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

Задача К2.4. 8

$x = 5t + \frac{1}{4}\cos^2 8t$,
$y = 2\arcsin(t/4)$,
$z = 3\ln(4t + 2),\ t_1 = 0.3.$

Задача К2.5. 8

$x = 13e^{t/4}$,
$y = 4t + \cos^2 4t$,
$z = 3t^2 + 3t + 2,\ t_1 = 0.2.$

Задача К2.6. 8

$x = \dfrac{7}{2t + 3}$,
$y = 3\arcsin(t/4)$,
$z = 4e^{(t^2)},\ t_1 = 0.3.$

Задача К2.7. 8

$x = 13e^{t/4}$,
$y = 2\ln(2t + 2)$,
$z = 5\mathrm{tg}(t/4),\ t_1 = 0.2.$

Задача К2.8. 8

$x = 3t^2 + 10t + 2$,
$y = 20e^{t/4}$,
$z = 11t + \cos^2 4t,\ t_1 = 0.9.$

Задача К2.9. 8

$x = \frac{1}{2}\sin 6t + 6t$,
$y = 6e^{(t^2)}$,
$z = 7(t + 1)^{1/5},\ t_1 = 0.5.$

Задача К2.10. 8

$x = 3\ln(3t + 2)$,
$y = 2t^2 + 4t + 3$,
$z = 5t + \frac{1}{2}\cos^2 6t,\ t_1 = 0.3.$

Задача К2.11. *8*

$x = 6t + \frac{1}{4}\cos^2 8t,$
$y = 5e^{(t^2)},$
$z = 5\sqrt{4t+5},\ t_1 = 0.4.$

Задача К2.12. *8*

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

Задача К2.13. *8*

$x = 11(t+1)^{1/5},$
$y = 20e^{t/3},$
$z = 11(t+1)^{1/5},\ t_1 = 0.9.$

Задача К2.14. *8*

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

Задача К2.15. *8*

$x = 18e^{t/3},$
$y = 2t^2 + 8t + 3,$
$z = \frac{1}{2}\sin 6t + 8t,\ t_1 = 0.7.$

Задача К2.16. *8*

$x = 4\sqrt{4t+4},$
$y = 3\mathrm{tg}(t/2),$
$z = 5(t+1)^{1/10},\ t_1 = 0.3.$

Задача К2.17. *8*

$x = 6(t+1)^{3/10},$
$y = 5\mathrm{tg}(t/4),$
$z = 4\arcsin(t/5),\ t_1 = 0.4.$

Задача К2.18. *8*

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

Задача К2.19. *8*

$x = 6t + \frac{1}{2}\cos^2 6t,$
$y = 5\sqrt{3t+5},$
$z = \frac{1}{2}\sin 6t + 5t,\ t_1 = 0.4.$

Задача К2.20. *8*

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

Задача К2.21. *8*

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

Задача К2.22. *8*

$x = 3t + \cos^2 4t,$
$y = \frac{1}{2}\sin 8t + 2t,$
$z = 2\sqrt{2t+2},\ t_1 = 0.1.$

Задача K2.23. *8*

$x = 2\arcsin(t/4),$
$y = 4\sqrt{4t + 4},$
$z = 14e^{t/2},\ t_1 = 0.3.$

Задача K2.24. *8*

$x = 6\ln(3t + 2),$
$y = \dfrac{10}{2t + 3},$
$z = 8t + \frac{1}{2}\cos^2 6t,\ t_1 = 0.6.$

Задача K2.25. *8*

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

Задача K2.26. *8*

$x = \frac{1}{2}\sin^2 8t - 6t,$
$y = 5\ln(2t + 2),$
$z = 7(t + 1)^{3/10},\ t_1 = 0.5.$

Задача K2.27. *8*

$x = 6\ln(3t + 2),$
$y = 8t + \frac{1}{2}\cos^2 6t,$
$z = \frac{1}{2}\sin 6t + 7t,\ t_1 = 0.6.$

Задача K2.28. *8*

$x = 11(t + 1)^{1/10},$
$y = 9\ln(4t + 2),$
$z = 10\sqrt{4t + 10},\ t_1 = 0.9.$

Задача K2.29. *8*

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

Задача K2.30. *8*

$x = \frac{1}{2}\sin 8t + 4t,$
$y = 5\mathrm{tg}(t/4),$
$z = 4\arcsin(t/4),\ t_1 = 0.3.$

Задача K2.31. *8*

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

Задача K2.32. *8*

$x = 11e^{(t^2)},$
$y = \frac{1}{2}\sin^2 6t - 11t,$
$z = \frac{1}{2}\sin 6t + 11t,\ t_1 = 1.$

Задача K2.33. *8*

$x = 5\sqrt{2t + 5},$
$y = 6(t + 1)^{3/10},$
$z = \dfrac{8}{3t + 4},\ t_1 = 0.4.$

Задача K2.34. *8*

$x = \dfrac{9}{3t + 4},$
$y = 6e^{(t^2)},$
$z = 6\sqrt{2t + 6},\ t_1 = 0.5.$

К2 Ответы.
Декартовы координаты. Пространственная траектория 07.04.2012

№	v_x	v_y	v_z	v	a_x	a_y	a_z	a	a_τ	a_n	R
1	1.41	3.78	0.38	4.05	0.22	−0.56	0.00	0.60	−0.45	0.41	40.186
2	5.36	−11.92	4.12	13.70	1.34	12.99	−2.42	13.28	−11.50	6.64	28.261
3	6.44	3.78	10.80	13.13	18.69	−0.56	4.00	19.13	12.30	14.65	11.763
4	6.99	0.50	3.75	7.95	−2.80	0.01	−4.69	5.46	−4.67	2.82	22.381
5	3.42	0.00	4.20	5.41	0.85	0.93	6.00	6.13	5.19	3.26	8.992
6	−1.08	0.75	2.63	2.94	1.20	0.01	10.33	10.40	8.80	5.55	1.556
7	3.42	1.67	1.25	4.00	0.85	−1.39	0.03	1.63	0.16	1.62	9.872
8	15.40	6.26	7.83	18.37	6.00	1.57	−19.47	20.43	−2.73	20.25	16.673
9	3.03	7.70	1.01	8.34	−2.54	23.11	−0.54	23.26	20.36	11.24	6.188
10	3.10	5.20	6.33	8.76	−3.21	4.00	32.28	32.69	24.56	21.57	3.556
11	5.77	4.69	3.89	8.39	−31.78	15.49	−1.18	35.38	−13.72	32.61	2.160
12	2.63	3.75	−2.65	5.29	10.33	−4.69	−11.80	16.37	7.71	14.43	1.938
13	1.32	9.00	1.32	9.19	−0.55	3.00	−0.55	3.10	2.78	1.38	61.400
14	4.72	4.60	1.53	6.77	−7.46	2.00	0.23	7.72	−3.79	6.73	6.812
15	7.58	10.80	6.53	14.72	2.53	4.00	15.69	16.39	11.19	11.97	18.106
16	3.51	1.53	0.39	3.85	−1.35	0.23	−0.27	1.40	−1.17	0.77	19.273
17	1.42	1.26	0.80	2.06	−0.71	0.06	0.01	0.71	−0.45	0.56	7.643
18	−5.33	5.20	0.75	7.48	−32.28	4.00	0.01	32.53	25.77	19.86	2.820
19	8.99	3.01	2.79	9.88	−3.15	−0.73	−12.16	12.58	−6.52	10.76	9.073
20	−7.70	−0.89	7.35	10.68	−63.02	0.92	31.88	70.63	67.28	21.49	5.307
21	4.00	27.31	10.52	29.54	−0.53	77.83	35.45	85.53	84.52	13.11	66.567
22	0.13	4.79	1.35	4.97	−22.29	−22.96	−0.61	32.01	−22.84	22.42	1.104
23	0.50	3.51	8.13	8.87	0.01	−1.35	4.07	4.28	3.19	2.85	27.569
24	4.74	−1.13	5.62	7.44	−3.74	1.08	−21.90	22.24	−19.10	11.41	4.847
25	−9.02	5.68	59.80	60.74	−2.33	−0.76	179.41	179.42	176.90	30.00	122.988
26	−2.04	3.33	1.58	4.22	−9.31	−2.22	−0.74	9.60	2.48	9.28	1.917
27	4.74	5.62	4.31	8.52	−3.74	−21.90	7.97	23.60	−12.49	20.02	3.625
28	0.62	6.43	5.42	8.43	−0.29	−4.59	−0.80	4.67	−4.03	2.35	30.247
29	0.50	5.36	18.28	19.06	0.01	1.34	51.71	51.73	49.98	13.33	27.250
30	1.05	1.26	1.00	1.92	−21.61	0.05	0.02	21.61	−11.78	18.12	0.204
31	12.04	7.35	0.57	14.12	34.51	31.88	0.01	46.98	46.03	9.41	21.179
32	59.80	−12.61	13.88	62.67	179.41	30.38	5.03	182.03	166.19	74.27	52.887
33	2.08	1.42	−0.89	2.67	−0.36	−0.71	1.02	1.30	−1.00	0.83	8.595
34	−0.89	7.70	2.27	8.08	0.97	23.11	−0.32	23.14	21.84	7.64	8.547

К2 файл   o2k8A