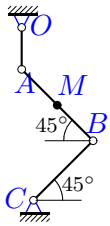


Сложное движение точки, плоское переносное движение

Плоский шарнирно-стержневой механизм приводится в движение кривошипом OA , который вращается против часовой стрелки с постоянной угловой скоростью ω . Вдоль стержня AB движется точка M по закону $AM = \sigma(t)$ или $BM = \sigma(t)$. Положение механизма при $t = t_1$ указано на рисунке. Все размеры даны в сантиметрах. Стержни, положение которых не задано углом, горизонтальны или вертикальны. Найти абсолютную скорость и абсолютное ускорение точки M в этот момент.

Задача K12.1.

4



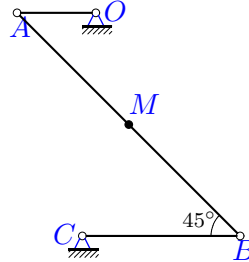
$$BM = 8(\sin(\pi t/6) + t^2); t = 1 \text{ с},$$

$$\omega_{OA} = 2 \frac{1}{\text{с}},$$

$$OA = 10, AB = 24, BC = 20$$

Задача K12.2.

4



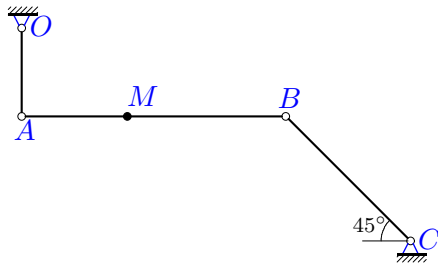
$$BM = 18t + 8 \sin^2(\pi t/6); t = 1 \text{ с},$$

$$\omega_{OA} = 3.2 \frac{1}{\text{с}},$$

$$OA = 10, AB = 40, BC = 20$$

Задача K12.3.

4



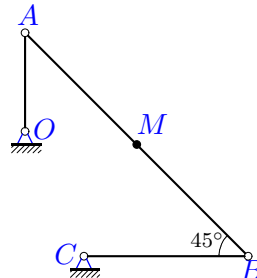
$$AM = 12(\sin(\pi t/6) + t^2); t = 3 \text{ с},$$

$$\omega_{OA} = 0.7 \frac{1}{\text{с}},$$

$$OA = 100, AB = 300, BC = 200$$

Задача K12.4.

4



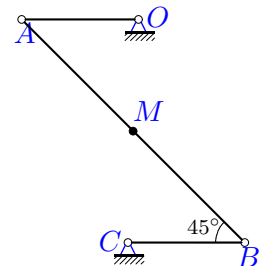
$$BM = 8t(8 - t); t = 2 \text{ с},$$

$$\omega_{OA} = 1.5 \frac{1}{\text{с}},$$

$$OA = 60, AB = 192, BC = 100$$

Задача K12.5.

4



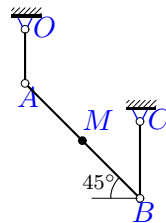
$$BM = 9t(2 + \cos(\pi t/3)); t = 2 \text{ с},$$

$$\omega_{OA} = 1.1 \frac{1}{\text{с}},$$

$$OA = 20, AB = 54, BC = 20$$

Задача K12.6.

4



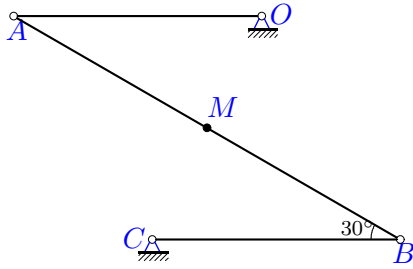
$$BM = 16t + 8 \sin^2(\pi t/6); t = 1 \text{ с},$$

$$\omega_{OA} = 2.6 \frac{1}{\text{с}},$$

$$OA = 12, AB = 36, BC = 17$$

Задача K12.7.

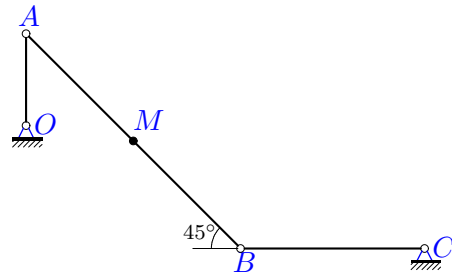
4



$BM = 6(\sin(\pi t/6) + t^2); t = 1 \text{ c},$
 $\omega_{OA} = 1.5 \frac{1}{\text{c}},$
 $OA = 10, AB = 18, BC = 10$

Задача K12.8.

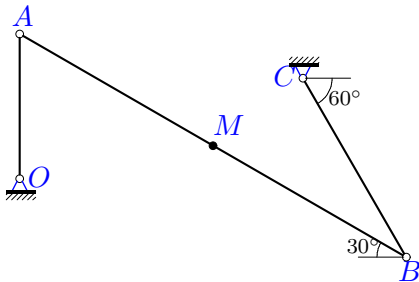
4



$BM = 11(\sin(\pi t/6) + t^2); t = 1 \text{ c},$
 $\omega_{OA} = 2.7 \frac{1}{\text{c}},$
 $OA = 10, AB = 33, BC = 20$

Задача K12.9.

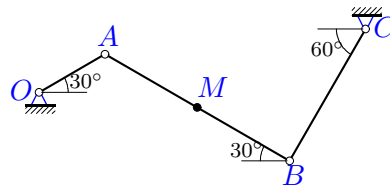
4



$BM = 9t(8 - t); t = 2 \text{ c},$
 $\omega_{OA} = 1.5 \frac{1}{\text{c}},$
 $OA = 70, AB = 216, BC = 100$

Задача K12.10.

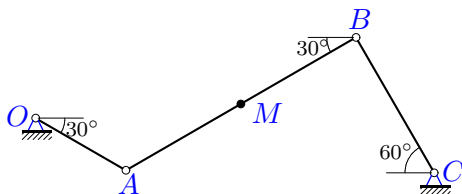
4



$BM = 12t + 8 \sin^2(\pi t/6); t = 1 \text{ c},$
 $\omega_{OA} = 2.6 \frac{1}{\text{c}},$
 $OA = 10, AB = 28, BC = 20$

Задача K12.11.

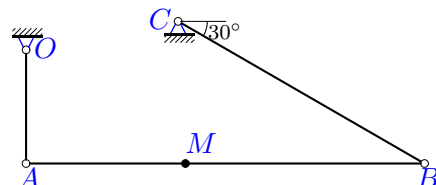
4



$AM = 10(\sin(\pi t/6) + t^2); t = 5 \text{ c},$
 $\omega_{OA} = 0.5 \frac{1}{\text{c}},$
 $OA = 200, AB = 510, BC = 300$

Задача K12.12.

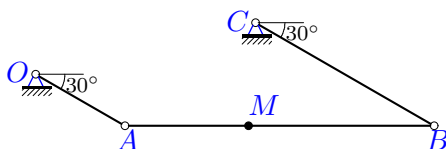
4



$AM = 10t + 8 \sin^2(\pi t/4); t = 2 \text{ c},$
 $\omega_{OA} = 1.5 \frac{1}{\text{c}},$
 $OA = 20, AB = 70, BC = 50$

Задача K12.13.

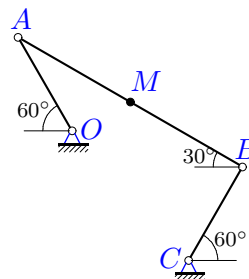
4



$AM = 10t(2 + \cos(\pi t/3)); t = 4 \text{ c},$
 $\omega_{OA} = 2 \frac{1}{\text{c}},$
 $OA = 50, AB = 150, BC = 100$

Задача K12.14.

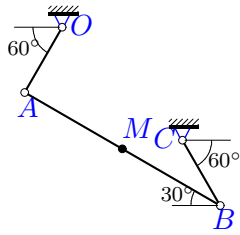
4



$BM = 10t + 8 \sin^2(\pi t/6); t = 1 \text{ c},$
 $\omega_{OA} = 2.4 \frac{1}{\text{c}},$
 $OA = 10, AB = 24, BC = 10$

Задача K12.15.

4



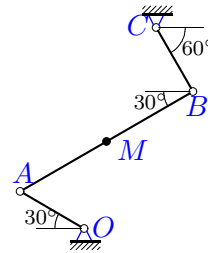
$$BM = 10t(2 + \cos(\pi t/3)); t = 2 \text{ с},$$

$$\omega_{OA} = 1.2 \frac{1}{\text{с}},$$

$$OA = 20, AB = 60, BC = 20$$

Задача K12.16.

4



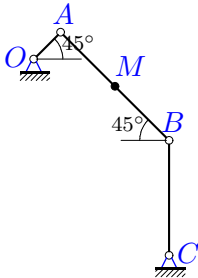
$$AM = 27t(3 - t); t = 1 \text{ с},$$

$$\omega_{OA} = 1.7 \frac{1}{\text{с}},$$

$$OA = 40, AB = 108, BC = 40$$

Задача K12.17.

4



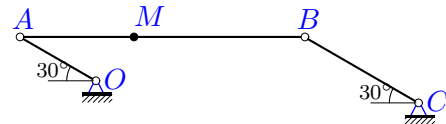
$$BM = 18t + 8 \sin^2(\pi t/6); t = 1 \text{ с},$$

$$\omega_{OA} = 3.2 \frac{1}{\text{с}},$$

$$OA = 10, AB = 40, BC = 30$$

Задача K12.18.

4



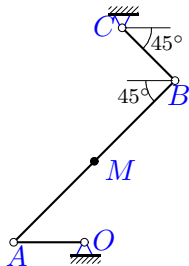
$$AM = 26t(3 - t); t = 1 \text{ с},$$

$$\omega_{OA} = 1.6 \frac{1}{\text{с}},$$

$$OA = 40, AB = 130, BC = 60$$

Задача K12.19.

4



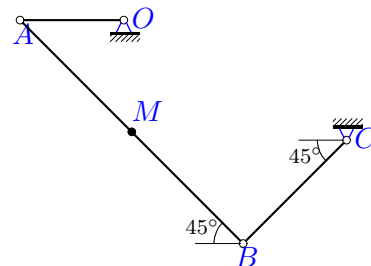
$$AM = 6(\sin(\pi t/6) + t^2); t = 5 \text{ с},$$

$$\omega_{OA} = 0.6 \frac{1}{\text{с}},$$

$$OA = 95, AB = 306, BC = 100$$

Задача K12.20.

4



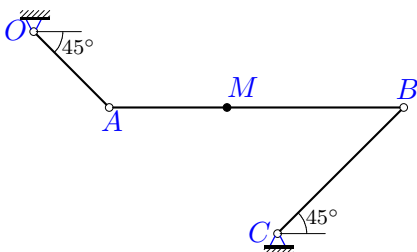
$$BM = 9t(8 - t); t = 2 \text{ с},$$

$$\omega_{OA} = 1.5 \frac{1}{\text{с}},$$

$$OA = 71, AB = 216, BC = 100$$

Задача K12.21.

4



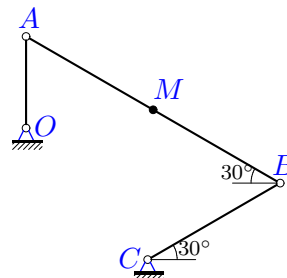
$$AM = 11t(5 - t); t = 2 \text{ с},$$

$$\omega_{OA} = 1.2 \frac{1}{\text{с}},$$

$$OA = 60, AB = 165, BC = 100$$

Задача K12.22.

4



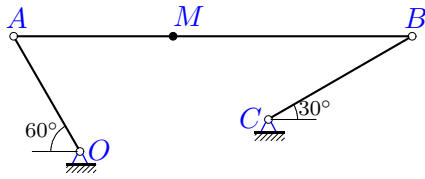
$$BM = 8t(8 - t); t = 2 \text{ с},$$

$$\omega_{OA} = 1.5 \frac{1}{\text{с}},$$

$$OA = 60, AB = 192, BC = 100$$

Задача K12.23.

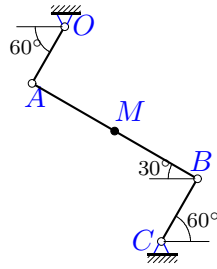
4



$AM = 24t(3 - t); t = 1 \text{ с},$
 $\omega_{OA} = 1.6 \frac{1}{\text{с}},$
 $OA = 40, AB = 120, BC = 50$

Задача K12.24.

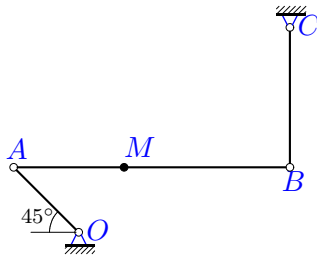
4



$BM = 4t(14 - t); t = 3 \text{ с},$
 $\omega_{OA} = 1.4 \frac{1}{\text{с}},$
 $OA = 90, AB = 264, BC = 100$

Задача K12.25.

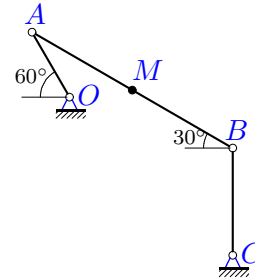
4



$AM = 12t(2 + \cos(\pi t/3)); t = 4 \text{ с},$
 $\omega_{OA} = 2 \frac{1}{\text{с}},$
 $OA = 60, AB = 180, BC = 91$

Задача K12.26.

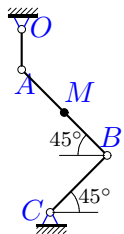
4



$BM = 9t(8 - t); t = 2 \text{ с},$
 $\omega_{OA} = 1.5 \frac{1}{\text{с}},$
 $OA = 70, AB = 216, BC = 100$

Задача K12.27.

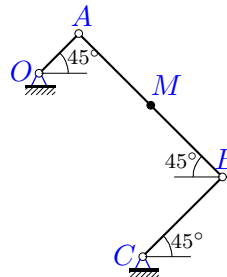
4



$BM = 16t + 8 \sin^2(\pi t/6); t = 1 \text{ с},$
 $\omega_{OA} = 2.6 \frac{1}{\text{с}},$
 $OA = 12, AB = 36, BC = 24$

Задача K12.28.

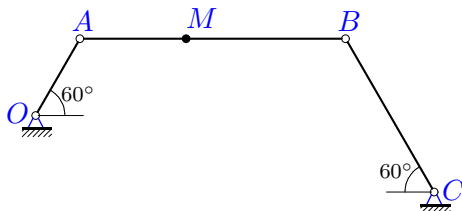
4



$BM = 9t(12 - t); t = 2 \text{ с},$
 $\omega_{OA} = 1.7 \frac{1}{\text{с}},$
 $OA = 100, AB = 360, BC = 200$

Задача K12.29.

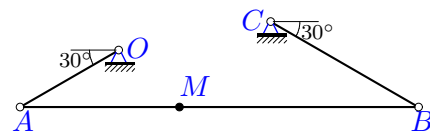
4



$AM = 8t + 8 \sin^2(\pi t/4); t = 2 \text{ с},$
 $\omega_{OA} = 1.4 \frac{1}{\text{с}},$
 $OA = 20, AB = 60, BC = 40$

Задача K12.30.

4



$AM = 10t + 8 \sin^2(\pi t/4); t = 2 \text{ с},$
 $\omega_{OA} = 1.5 \frac{1}{\text{с}},$
 $OA = 20, AB = 70, BC = 30$

К12 Ответы.**Сложное движение точки, плоское переносное движение**

07.04.2012

№	ω_e	ε_e	v_r^T	v_{xe}	v_{ye}	v_e	v	a_r^T	a_e	a_C	a
1	-0.589	-1.595	-19.63	15.00	-5.00	15.811	8.949	-14.903	33.71	23.13	57.306
2	-0.000	-5.431	-21.63	-0.00	-32.00	32.000	22.649	-2.193	80.95	0.00	78.999
3	0.233	-0.449	72.00	70.00	28.00	75.392	144.734	20.710	8.14	33.60	32.054
4	0.663	-0.157	-32.00	-45.00	45.00	63.640	95.640	16.000	122.71	42.43	167.927
5	-0.000	-1.268	2.82	-0.00	-22.00	22.000	24.080	6.455	24.20	0.00	29.124
6	0.000	-0.937	-19.63	31.20	-0.00	31.200	22.196	-2.193	70.21	0.00	72.014
7	-0.000	-5.000	-14.72	-0.00	-15.00	15.000	14.862	-11.178	38.97	0.00	34.758
8	1.157	2.901	-26.99	-13.50	13.50	19.092	46.080	-20.492	29.69	62.45	66.743
9	-0.486	3.916	-36.00	-131.25	-45.47	138.902	164.733	18.000	291.45	35.00	329.341
10	-0.464	2.996	-15.63	-16.25	16.89	23.436	38.694	-2.193	40.39	14.51	39.067
11	-0.098	-0.134	95.47	62.50	64.95	90.139	183.776	18.629	28.94	18.72	13.014
12	0.742	0.460	10.00	30.00	20.78	36.497	45.078	-9.870	59.90	14.85	76.998
13	-0.000	-1.333	51.28	50.00	86.60	100.000	133.255	40.070	174.36	0.00	134.628
14	0.866	0.600	-13.63	-15.59	-3.00	15.875	27.655	-2.193	46.24	23.60	59.500
15	0.693	2.529	3.14	31.18	6.00	31.749	34.183	7.172	105.64	4.35	109.246
16	0.315	1.730	27.00	-42.50	-44.17	61.294	36.138	-54.000	52.88	17.00	10.410
17	-0.800	-0.494	-21.63	-33.94	11.31	35.777	55.964	-2.193	113.00	34.60	79.102
18	-0.000	0.525	26.00	-32.00	-55.43	64.000	55.749	-52.000	91.84	0.00	43.777
19	0.132	0.132	57.28	-14.25	-42.75	45.062	26.349	11.178	21.89	15.09	34.545
20	0.349	-0.260	-36.00	26.62	-79.88	84.196	54.432	18.000	131.01	25.10	132.108
21	-0.617	-0.063	11.00	50.91	10.18	51.920	62.743	-22.000	103.31	13.58	116.579
22	0.469	0.046	-32.00	-67.50	38.97	77.942	109.942	16.000	121.72	30.00	155.593
23	1.067	-2.125	24.00	-55.43	19.20	58.657	36.827	-48.000	190.73	51.20	148.669
24	0.000	-1.270	-32.00	109.12	-63.00	126.000	94.000	8.000	8.82	0.00	11.908
25	0.471	1.382	61.53	-84.85	-50.91	98.955	55.999	48.085	168.97	58.01	202.156
26	0.281	0.487	-36.00	-75.78	-26.25	80.195	107.272	18.000	130.53	20.21	153.074
27	-0.613	-2.157	-19.63	23.40	-7.80	24.666	11.296	-2.193	66.75	24.06	78.816
28	0.000	0.401	-72.00	-120.21	120.21	170.000	242.000	18.000	216.75	0.00	217.496
29	-0.467	-0.126	8.00	-24.25	2.80	24.410	16.488	-9.870	44.53	7.47	56.374
30	0.742	0.546	10.00	15.00	-5.20	15.875	25.534	-9.870	44.51	14.85	54.370

К12 файл o12k4A

N_0	a_{xr}	a_{yr}	a_{xe}	a_{ye}	a_x	a_y
1	-10.538	10.538	-16.482	29.411	-10.664	56.305
2	-1.551	1.551	25.600	-76.800	24.049	-75.249
3	20.710	0.000	-6.533	-4.852	14.177	28.748
4	11.314	-11.314	-40.500	-115.838	-59.186	-157.152
5	4.564	-4.564	-0.000	-24.200	4.564	-28.764
6	-1.551	1.551	-11.929	69.191	-13.480	70.741
7	-9.680	5.589	-0.000	-38.971	-9.680	-33.382
8	-14.490	14.490	18.225	-23.434	-40.427	-53.106
9	15.588	-9.000	189.371	221.542	222.460	242.853
10	-1.899	1.097	-40.184	4.036	-34.827	17.700
11	16.133	9.315	-28.349	-5.801	-2.856	-12.697
12	-9.870	0.000	-15.429	57.877	-25.298	72.723
13	40.070	0.000	-173.205	20.000	-133.135	20.000
14	-1.899	1.097	24.606	-39.148	10.905	-58.492
15	6.211	-3.586	39.858	97.837	48.243	98.017
16	-46.765	-27.000	48.775	20.416	-6.491	8.139
17	-1.551	1.551	-88.439	-70.337	-65.521	-44.318
18	-52.000	0.000	88.681	-23.893	36.681	-23.893
19	7.904	7.904	18.030	12.417	15.264	30.990
20	12.728	-12.728	130.580	-10.604	125.558	-41.082
21	-22.000	0.000	-86.229	56.903	-108.229	43.327
22	13.856	-8.000	-16.076	-120.656	-17.219	-154.637
23	-48.000	0.000	-3.413	-190.696	-51.413	-139.496
24	6.928	-4.000	4.410	7.638	11.338	3.638
25	48.085	0.000	153.706	-70.175	201.790	-12.163
26	15.588	-9.000	97.693	-86.575	103.178	-113.075
27	-1.551	1.551	-32.230	58.450	-16.770	77.011
28	12.728	-12.728	-153.265	-153.265	-140.537	-165.993
29	-9.870	0.000	-24.827	-36.966	-34.696	-44.432
30	-9.870	0.000	23.543	37.777	13.673	52.623