

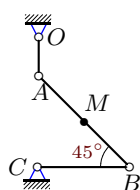
Движение точки по звену механизма

Плоский шарнирно-стержневой механизм приводится в движение кривошипом OA , который вращается против часовой стрелки с постоянной угловой скоростью ω . Вдоль стержня A 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 см. Стержни, положение которых не задано углом, горизонтальны или вертикальны. Найти абсолютную скорость и абсолютное ускорение точки M в этот момент.

Кирсанов М.Н. Решебник. Теоретическая механика с. 209.

Вариант 1

K12.



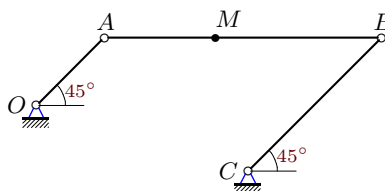
$$\omega_{OA} = 2.7 \frac{1}{c},$$

$$BM = 13(\sin(\pi t/6) + t^2); t = 1 \text{ c},$$

$$OA=12, AB=39, BC=28$$

Вариант 2

K12.



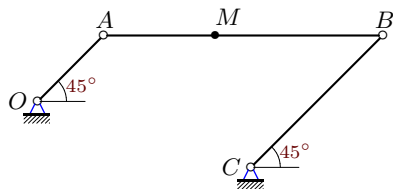
$$\omega_{OA} = 2 \frac{1}{c},$$

$$AM = 14t(2 + \cos(\pi t/3)); t = 4 \text{ c},$$

$$OA=73, AB=210, BC=143$$

Вариант 3

K12.



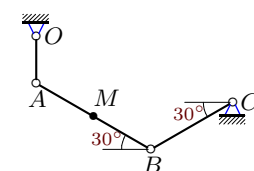
$$\omega_{OA} = 1.2 \frac{1}{c},$$

$$AM = 16t(5 - t); t = 2 \text{ c},$$

$$OA=80, AB=240, BC=160$$

Вариант 4

K12.



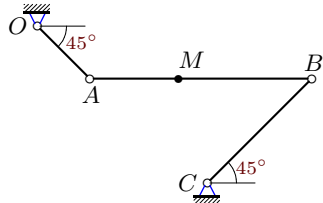
$$\omega_{OA} = 2.6 \frac{1}{c},$$

$$BM = 12t + 8 \sin^2(\pi t/6); t = 1 \text{ c},$$

$$OA=10, AB=28, BC=20$$

Вариант 5

K12.



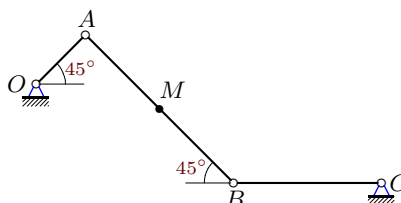
$$\omega_{OA} = 0.7 \frac{1}{c},$$

$$AM = 8(\sin(\pi t/6) + t^2); t = 3 \text{ c},$$

$$OA=67, AB=200, BC=133$$

Вариант 6

K12.



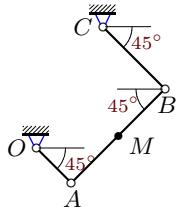
$$\omega_{OA} = 1.2 \frac{1}{c},$$

$$BM = 12t(2 + \cos(\pi t/3)); t = 2 \text{ c},$$

$$OA=24, AB=72, BC=51$$

Вариант 7

K12.



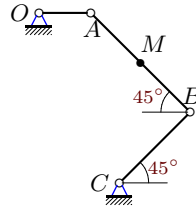
$$\omega_{OA} = 1.7 \frac{1}{c},$$

$$AM = 29t(3-t); t = 1 \text{ c},$$

$$OA=43, AB=116, BC=77$$

Вариант 8

K12.



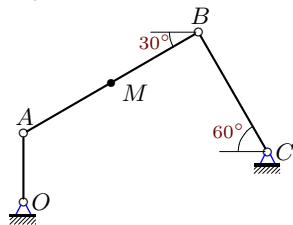
$$\omega_{OA} = 1.1 \frac{1}{c},$$

$$BM = 15t(2 + \cos(\pi t/3)); t = 2 \text{ c},$$

$$OA=33, AB=90, BC=64$$

Вариант 9

K12.



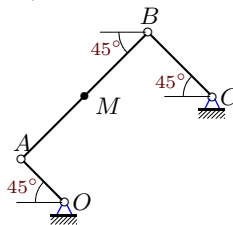
$$\omega_{OA} = 1.7 \frac{1}{c},$$

$$AM = 22t(3-t); t = 1 \text{ c},$$

$$OA=30, AB=88, BC=60$$

Вариант 10

K12.



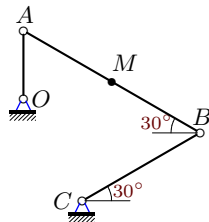
$$\omega_{OA} = 1.2 \frac{1}{c},$$

$$AM = 15t(2 + \cos(\pi t/3)); t = 6 \text{ c},$$

$$OA=184, AB=540, BC=274$$

Вариант 11

K12.



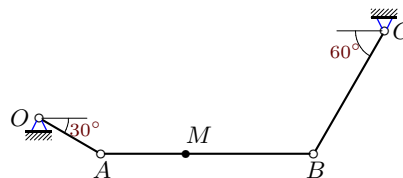
$$\omega_{OA} = 1.5 \frac{1}{c},$$

$$BM = 10t(8-t); t = 2 \text{ c},$$

$$OA=80, AB=240, BC=160$$

Вариант 12

K12.



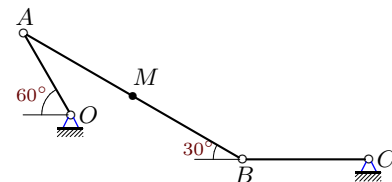
$$\omega_{OA} = 1.6 \frac{1}{c},$$

$$AM = 12t(3-t); t = 1 \text{ c},$$

$$OA=20, AB=60, BC=40$$

Вариант 13

K12.



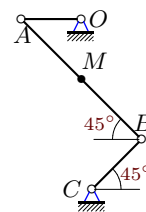
$$\omega_{OA} = 2.1 \frac{1}{c},$$

$$BM = 8t(6-t); t = 1 \text{ c},$$

$$OA=30, AB=80, BC=40$$

Вариант 14

K12.



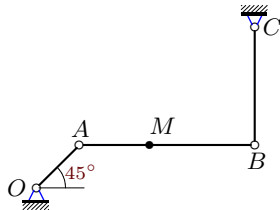
$$\omega_{OA} = 1.5 \frac{1}{c},$$

$$BM = 12t(8-t); t = 2 \text{ c},$$

$$OA=101, AB=288, BC=119$$

Вариант 15

K12.



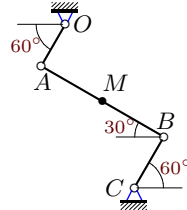
$$\omega_{OA} = 1.2 \frac{1}{c},$$

$$AM = 15t(5 - t); t = 2 \text{ c},$$

$$OA=78, AB=225, BC=151$$

Вариант 16

K12.



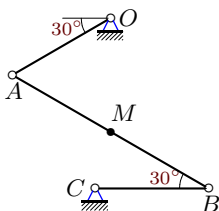
$$\omega_{OA} = 1.4 \frac{1}{c},$$

$$BM = 4t(14 - t); t = 3 \text{ c},$$

$$OA=90, AB=264, BC=110$$

Вариант 17

K12.



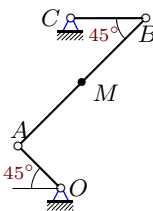
$$\omega_{OA} = 2.2 \frac{1}{c},$$

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

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

Вариант 18

K12.



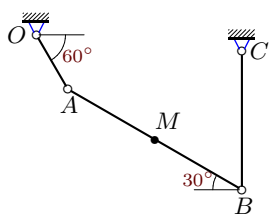
$$\omega_{OA} = 1.5 \frac{1}{c},$$

$$AM = 20t + 8 \sin^2(\pi t/3); t = 3 \text{ c},$$

$$OA=40, AB=120, BC=50$$

Вариант 19

K12.



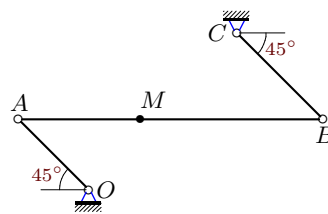
$$\omega_{OA} = 1.6 \frac{1}{c},$$

$$BM = 5t(10 - t); t = 2 \text{ c},$$

$$OA=50, AB=160, BC=110$$

Вариант 20

K12.



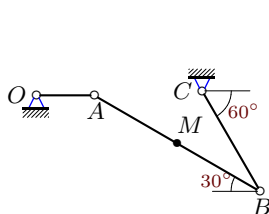
$$\omega_{OA} = 0.7 \frac{1}{c},$$

$$AM = 11(\sin(\pi t/6) + t^2); t = 3 \text{ c},$$

$$OA=90, AB=275, BC=110$$

Вариант 21

K12.



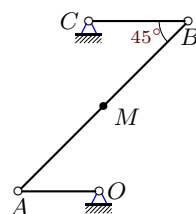
$$\omega_{OA} = 2.7 \frac{1}{c},$$

$$BM = 11(\sin(\pi t/6) + t^2); t = 1 \text{ c},$$

$$OA=10, AB=33, BC=20$$

Вариант 22

K12.



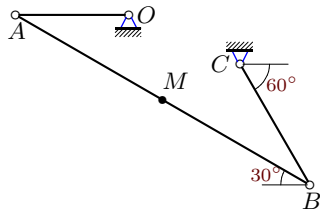
$$\omega_{OA} = 1.7 \frac{1}{c},$$

$$AM = 23t(3 - t); t = 1 \text{ c},$$

$$OA=31, AB=92, BC=38$$

Вариант 23

K12.



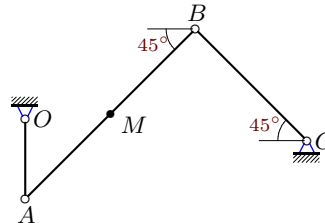
$$\omega_{OA} = 1.4 \frac{1}{c},$$

$$BM = 5t(16 - t); t = 3 \text{ c},$$

$$OA=130, AB=390, BC=160$$

Вариант 24

K12.



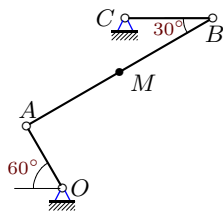
$$\omega_{OA} = 1.2 \frac{1}{c},$$

$$AM = 11t(2 + \cos(\pi t/3)); t = 6 \text{ c},$$

$$OA=132, AB=396, BC=260$$

Вариант 25

K12.



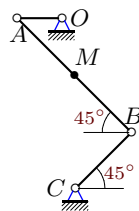
$$\omega_{OA} = 0.6 \frac{1}{c},$$

$$AM = 14(\sin(\pi t/6) + t^2); t = 5 \text{ c},$$

$$OA=240, AB=714, BC=290$$

Вариант 26

K12.



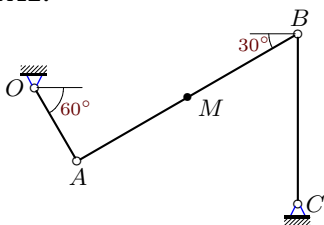
$$\omega_{OA} = 1.2 \frac{1}{c},$$

$$BM = 15t(2 + \cos(\pi t/3)); t = 2 \text{ c},$$

$$OA=25, AB=90, BC=44$$

Вариант 27

K12.



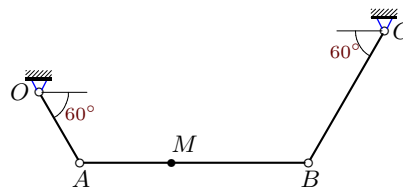
$$\omega_{OA} = 1.5 \frac{1}{c},$$

$$AM = 10t + 8 \sin^2(\pi t/3); t = 3 \text{ c},$$

$$OA=20, AB=60, BC=40$$

Вариант 28

K12.



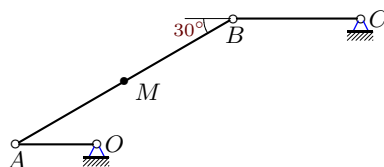
$$\omega_{OA} = 0.7 \frac{1}{c},$$

$$AM = 9(\sin(\pi t/6) + t^2); t = 3 \text{ c},$$

$$OA=80, AB=225, BC=150$$

Вариант 29

K12.



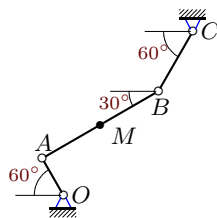
$$\omega_{OA} = 1.3 \frac{1}{c},$$

$$AM = 6t(2 + \cos(\pi t/3)); t = 6 \text{ c},$$

$$OA=70, AB=216, BC=110$$

Вариант 30

K12.



$$\omega_{OA} = 1.3 \frac{1}{c},$$

$$AM = 7t(2 + \cos(\pi t/3)); t = 6 \text{ c},$$

$$OA=80, AB=252, BC=130$$

Ответы

	ω_e	ε_e	v_r^T	v_e	v	W_r^T	W_e	W_C	W
1	-1.17	0.02	-31.89	22.91	8.98	-24.22	108.43	74.95	177.75
2	0.00	0.96	71.79	146.00	107.92	56.10	241.69	0.00	195.94
3	0.00	0.34	16.00	96.00	85.44	-32.00	95.00	0.00	123.54
4	-0.93	0.50	-15.63	22.52	6.89	-2.19	79.98	29.02	106.05
5	-0.33	-0.01	48.00	33.82	81.43	13.81	39.22	31.84	20.39
6	0.40	1.28	3.77	32.20	28.88	8.61	12.84	3.01	14.77
7	0.00	-0.47	29.00	73.10	102.10	-58.00	96.83	0.00	112.88
8	-0.29	0.20	4.71	28.70	24.58	10.76	37.26	2.68	30.47
9	-0.29	0.48	22.00	45.97	25.57	-44.00	71.47	12.75	112.77
10	-0.00	0.16	45.00	220.80	175.80	-98.70	221.44	0.00	242.44
11	0.50	0.14	-40.00	103.92	143.92	20.00	151.00	40.00	195.67
12	-0.62	0.38	12.00	20.57	30.84	-24.00	63.77	14.78	79.99
13	1.36	4.05	-32.00	31.50	63.50	16.00	103.90	87.30	56.80
14	0.37	-0.89	-48.00	119.77	79.78	24.00	144.39	35.71	164.81
15	-0.29	0.48	15.00	77.18	64.78	-30.00	94.37	8.82	125.51
16	0.00	-1.21	-32.00	126.00	94.00	8.00	16.04	0.00	17.92
17	-1.10	-16.62	-11.63	29.10	23.22	-2.19	124.83	25.58	99.16
18	-0.50	2.20	20.00	67.08	50.00	17.55	44.43	20.00	21.97
19	-0.29	-0.71	-30.00	61.10	47.26	10.00	117.75	17.32	110.31
20	0.00	0.41	66.00	63.00	49.44	18.98	34.25	0.00	52.13
21	-1.42	-3.48	-26.99	13.50	40.49	-20.49	134.44	76.49	118.04
22	0.00	2.50	23.00	52.70	39.90	-46.00	81.76	0.00	54.51
23	0.81	0.58	-50.00	91.00	41.00	10.00	258.57	80.83	190.71
24	0.28	-0.46	33.00	125.23	155.44	-72.38	126.15	18.67	77.11
25	-0.35	0.71	133.65	190.49	125.14	26.08	172.94	93.37	76.02
26	0.24	-0.40	4.71	23.72	28.01	10.76	24.19	2.22	35.12
27	-0.29	-1.22	10.00	31.22	40.93	17.55	8.69	5.77	15.26
28	-0.25	0.04	54.00	48.82	102.65	15.53	45.39	26.88	14.55
29	0.00	0.40	18.00	91.00	83.47	-39.48	103.71	0.00	65.01
30	0.71	4.06	21.00	137.58	122.48	-46.06	382.17	30.02	421.46