

## Кинематические инварианты

В некоторый момент времени известны скорости трех точек тела, движущегося в пространстве. Заданы координаты этих точек. Найти кинематические инварианты движения.

### Задача К-29.1.

6

$$A = (0, 0, 0), B = (2, 0, 1), C = (1, 1, 1), \\ \vec{v}_A = (-1, 8, -4), \\ \vec{v}_B = (-9, -12, 12), \\ \vec{v}_C = (-1, -4, 8).$$

### Задача К-29.2.

6

$$A = (1, 0, 1), B = (-1, 0, 1), C = (2, 2, 0), \\ \vec{v}_A = (5, -7, -1), \\ \vec{v}_B = (5, 21, 9), \\ \vec{v}_C = (28, -23, -10).$$

### Задача К-29.3.

6

$$A = (1, 0, 2), B = (2, 1, 1), C = (1, 2, 1), \\ \vec{v}_A = (1, -2, -5), \\ \vec{v}_B = (5, -9, -8), \\ \vec{v}_C = (13, -1, -3).$$

### Задача К-29.4.

6

$$A = (1, 2, 2), B = (0, 0, -1), C = (-1, 1, 0), \\ \vec{v}_A = (2, -8, -1), \\ \vec{v}_B = (34, -33, 5), \\ \vec{v}_C = (21, -34, -7).$$

### Задача К-29.5.

6

$$A = (0, 2, 1), B = (2, 2, 2), C = (0, 0, -1), \\ \vec{v}_A = (-6, -4, 3), \\ \vec{v}_B = (-12, 16, 15), \\ \vec{v}_C = (20, -16, 15).$$

### Задача К-29.6.

6

$$A = (1, 1, 1), B = (-1, 0, 3), C = (0, 1, 1), \\ \vec{v}_A = (4, -4, 5), \\ \vec{v}_B = (19, -10, 17), \\ \vec{v}_C = (4, -11, 9).$$

### Задача К-29.7.

6

$$A = (0, 1, 1), B = (1, 1, 1), C = (1, -1, 1), \\ \vec{v}_A = (-4, 8, 4), \\ \vec{v}_B = (-4, -6, 9), \\ \vec{v}_C = (-32, -6, 13).$$

### Задача К-29.8.

6

$$A = (0, 2, 1), B = (2, 0, 1), C = (1, 0, 1), \\ \vec{v}_A = (-1, 5, 4), \\ \vec{v}_B = (17, 23, 12), \\ \vec{v}_C = (17, 14, 6).$$

### Задача К-29.9.

6

$$A = (1, 1, 1), B = (0, 1, 0), C = (2, 0, 0), \\ \vec{v}_A = (2, -8, -3), \\ \vec{v}_B = (-4, -9, 3), \\ \vec{v}_C = (3, 5, -15).$$

### Задача К-29.10.

6

$$A = (1, 2, 1), B = (1, 0, 2), C = (1, 0, 1), \\ \vec{v}_A = (2, -8, -3), \\ \vec{v}_B = (22, -2, 9), \\ \vec{v}_C = (16, -8, 9).$$

### Задача К-29.11.

6

$$A = (0, 2, 0), B = (0, 0, 2), C = (-1, 2, 2), \\ \vec{v}_A = (-7, -2, -5), \\ \vec{v}_B = (-7, 6, 3), \\ \vec{v}_C = (-23, -2, -13).$$

### Задача К-29.12.

6

$$A = (2, 2, 0), B = (0, 1, 2), C = (-1, 0, 1), \\ \vec{v}_A = (-6, 7, -5), \\ \vec{v}_B = (25, -11, 17), \\ \vec{v}_C = (26, -24, 29).$$

### Задача К-29.13.

6

$$A = (0, 1, 0), B = (0, 2, 1), C = (-1, 2, 0), \\ \vec{v}_A = (-1, -8, -2), \\ \vec{v}_B = (-17, -4, -6), \\ \vec{v}_C = (-9, -16, -14).$$

### Задача К-29.14.

6

$$A = (1, 2, 2), B = (2, 1, 0), C = (1, 2, -1), \\ \vec{v}_A = (4, 8, 5), \\ \vec{v}_B = (28, 26, 8), \\ \vec{v}_C = (19, 14, 5).$$

**Задача К-29.15.**

6

$$A = (0, 1, 0), B = (2, 3, 2), C = (1, 1, 1),$$
$$\vec{v}_A = (-4, -3, 2),$$
$$\vec{v}_B = (-4, -9, 8),$$
$$\vec{v}_C = (-10, -6, 8).$$

**Задача К-29.16.**

6

$$A = (1, 1, 2), B = (1, 2, 2), C = (0, 1, 2),$$
$$\vec{v}_A = (2, 2, -2),$$
$$\vec{v}_B = (8, 2, -4),$$
$$\vec{v}_C = (2, 8, -5).$$

**Задача К-29.17.**

6

$$A = (2, 1, 1), B = (-1, 1, 0), C = (0, 1, 0),$$
$$\vec{v}_A = (-1, -5, 3),$$
$$\vec{v}_B = (-7, -34, 21),$$
$$\vec{v}_C = (-7, -25, 15).$$

**Задача К-29.18.**

6

$$A = (1, 1, 2), B = (2, 0, 1), C = (0, 0, 1),$$
$$\vec{v}_A = (3, -6, -4),$$
$$\vec{v}_B = (3, 6, -16),$$
$$\vec{v}_C = (3, -10, 0).$$

**Задача К-29.19.**

6

$$A = (1, 1, 2), B = (-1, 2, 1), C = (0, 1, 1),$$
$$\vec{v}_A = (4, -5, -5),$$
$$\vec{v}_B = (4, 7, 7),$$
$$\vec{v}_C = (-4, -1, 3).$$

**Задача К-29.20.**

6

$$A = (0, 0, 1), B = (2, 2, 1), C = (2, 2, 0),$$
$$\vec{v}_A = (-5, 7, 1),$$
$$\vec{v}_B = (23, -21, 15),$$
$$\vec{v}_C = (28, -19, 15).$$

**Задача К-29.21.**

6

$$A = (1, 0, 2), B = (0, 0, 1), C = (1, 1, 1),$$
$$\vec{v}_A = (5, 6, 3),$$
$$\vec{v}_B = (-7, 17, 15),$$
$$\vec{v}_C = (5, 5, 2).$$

**Задача К-29.22.**

6

$$A = (1, 0, 1), B = (-1, 0, 0), C = (1, 1, 1),$$
$$\vec{v}_A = (8, -1, 4),$$
$$\vec{v}_B = (0, 11, 20),$$
$$\vec{v}_C = (16, -1, 0).$$

**Задача К-29.23.**

6

$$A = (1, 0, 1), B = (2, 1, 1), C = (2, 1, 0),$$
$$\vec{v}_A = (4, -6, 4),$$
$$\vec{v}_B = (11, -13, 4),$$
$$\vec{v}_C = (5, -7, 4).$$

**Задача К-29.24.**

6

$$A = (2, 0, 0), B = (2, -1, -1), C = (1, -1, 0),$$
$$\vec{v}_A = (-2, -6, -4),$$
$$\vec{v}_B = (-13, -2, -8),$$
$$\vec{v}_C = (-9, 1, -4).$$

**Задача К-29.25.**

6

$$A = (0, 1, 1), B = (2, 1, 2), C = (0, 1, 0),$$
$$\vec{v}_A = (-4, -7, 1),$$
$$\vec{v}_B = (-16, 18, 25),$$
$$\vec{v}_C = (8, -8, 1).$$

**Задача К-29.26.**

6

$$A = (1, 2, 1), B = (1, 0, -1), C = (1, 6, 1),$$
$$\vec{v}_A = (8, 1, -2),$$
$$\vec{v}_B = (40, -7, 6),$$
$$\vec{v}_C = (-24, 1, -18).$$

**Задача К-29.27.**

6

$$A = (1, 0, 1), B = (0, -1, -1), C = (2, 0, 0),$$
$$\vec{v}_A = (5, -4, -3),$$
$$\vec{v}_B = (13, -4, -7),$$
$$\vec{v}_C = (13, -16, 5).$$

**Задача К-29.28.**

6

$$A = (0, 1, 0), B = (3, 1, 1), C = (1, 0, 1),$$
$$\vec{v}_A = (-5, -7, 2),$$
$$\vec{v}_B = (-10, 33, 17),$$
$$\vec{v}_C = (4, 5, 5).$$

**К-29 Ответы.****Кинематические инварианты**

30.10.2013

№	$\omega_x$	$\omega_y$	$\omega_z$	$\omega$	$\vec{\omega} \cdot \vec{v}_A$
1	4	-8	-8	12	-36
2	-2	5	-14	15	-31
3	1	4	-8	9	33
4	-6	-6	7	11	29
5	-6	-6	7	11	81
6	-4	4	7	9	3
7	-2	-5	-14	15	-88
8	2	-6	9	11	4
9	6	6	7	11	-57
10	-6	6	7	11	-81
11	-4	-8	8	12	4
12	-2	10	11	15	27
13	-4	-8	8	12	52
14	2	-5	14	15	38
15	-3	-6	-6	9	18
16	-2	-3	-6	7	2
17	-2	6	9	11	-1
18	4	8	8	12	-68
19	-4	8	-8	12	-16
20	2	-5	-14	15	-59
21	-1	12	-12	17	31
22	-4	8	-8	12	-72
23	6	6	-7	11	-40
24	4	4	-7	9	-4
25	-1	-12	12	17	100
26	-4	-8	8	12	-56
27	-4	-8	-8	12	36
28	2	-5	14	15	53

К-29 файл о29к6А