

## 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.

4

$$A = (1, 1, 1), B = (2, 1, 0), C = (2, 1, -1),$$
$$\vec{v}_A = (7, -2, 3),$$
$$\vec{v}_B = (-1, -6, -5),$$
$$\vec{v}_C = (-9, -2, -5).$$

### Задача К-29.2.

4

$$A = (2, 0, 1), B = (0, 1, 2), C = (3, 3, 1),$$
$$\vec{v}_A = (-3, -1, -3),$$
$$\vec{v}_B = (6, 9, 5),$$
$$\vec{v}_C = (15, -7, 0).$$

### Задача К-29.3.

4

$$A = (1, 0, 1), B = (3, 0, 0), C = (3, -1, 0),$$
$$\vec{v}_A = (3, -6, -2),$$
$$\vec{v}_B = (11, -18, 14),$$
$$\vec{v}_C = (3, -18, 10).$$

### Задача К-29.4.

4

$$A = (1, 2, 2), B = (-1, 2, 1), C = (-1, 3, 1),$$
$$\vec{v}_A = (5, -1, -2),$$
$$\vec{v}_B = (-1, -21, 10),$$
$$\vec{v}_C = (-10, -21, 8).$$

### Задача К-29.5.

4

$$A = (2, 0, 0), B = (0, 1, 1), C = (1, 0, 0),$$
$$\vec{v}_A = (-5, 5, 3),$$
$$\vec{v}_B = (8, 25, 9),$$
$$\vec{v}_C = (-5, 12, 9).$$

### Задача К-29.6.

4

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

### Задача К-29.7.

4

$$A = (0, 1, 0), B = (2, 2, 1), C = (2, 1, 1),$$
$$\vec{v}_A = (-1, 6, 1),$$
$$\vec{v}_B = (-1, -9, 16),$$
$$\vec{v}_C = (-7, -9, 13).$$

### Задача К-29.8.

4

$$A = (1, 2, 2), B = (2, 1, 1), C = (0, 2, 1),$$
$$\vec{v}_A = (5, 1, -3),$$
$$\vec{v}_B = (20, 12, 1),$$
$$\vec{v}_C = (11, -6, -9).$$

### Задача К-29.9.

4

$$A = (1, 1, 2), B = (2, 3, 1), C = (0, 2, -1),$$
$$\vec{v}_A = (8, -3, -2),$$
$$\vec{v}_B = (-28, 10, -12),$$
$$\vec{v}_C = (-40, -12, 11).$$

### Задача К-29.10.

4

$$A = (0, 1, 1), B = (1, 0, 0), C = (3, 2, -1),$$
$$\vec{v}_A = (-7, -6, -1),$$
$$\vec{v}_B = (-8, -15, 7),$$
$$\vec{v}_C = (24, -35, 31).$$

### Задача К-29.11.

4

$$A = (1, 2, 2), B = (2, 0, 0), C = (1, 0, -1),$$
$$\vec{v}_A = (7, 8, 3),$$
$$\vec{v}_B = (49, 36, -4),$$
$$\vec{v}_C = (58, 32, -13).$$

### Задача К-29.12.

4

$$A = (0, 2, 0), B = (0, 1, 0), C = (0, 2, -1),$$
$$\vec{v}_A = (-4, -3, 2),$$
$$\vec{v}_B = (2, -3, 5),$$
$$\vec{v}_C = (2, -6, 2).$$

### Задача К-29.13.

4

$$A = (1, 1, 2), B = (0, 0, 2), C = (0, 2, 0),$$
$$\vec{v}_A = (8, -3, 4),$$
$$\vec{v}_B = (20, -15, -7),$$
$$\vec{v}_C = (20, -17, -9).$$

### Задача К-29.14.

4

$$A = (1, 2, 1), B = (-1, 2, 1), C = (1, 2, 2),$$
$$\vec{v}_A = (8, -7, -1),$$
$$\vec{v}_B = (8, -31, 17),$$
$$\vec{v}_C = (17, 1, -1).$$

**Задача К-29.15.**

4

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

**Задача К-29.17.**

4

$$A = (2, 2, 1), B = (2, -1, 1), C = (2, 1, 2),$$
$$\vec{v}_A = (-6, -7, -1),$$
$$\vec{v}_B = (27, -7, -7),$$
$$\vec{v}_C = (15, -9, -3).$$

**Задача К-29.19.**

4

$$A = (2, 2, 0), B = (-1, -1, 0), C = (0, 1, 1),$$
$$\vec{v}_A = (-6, -1, 3),$$
$$\vec{v}_B = (12, -19, 30),$$
$$\vec{v}_C = (6, -10, 18).$$

**Задача К-29.21.**

4

$$A = (2, 1, 0), B = (1, 1, 1), C = (1, 3, -1),$$
$$\vec{v}_A = (-6, 8, -5),$$
$$\vec{v}_B = (-2, 17, -1),$$
$$\vec{v}_C = (14, 23, 5).$$

**Задача К-29.23.**

4

$$A = (1, 2, 1), B = (0, 1, 2), C = (1, -1, 0),$$
$$\vec{v}_A = (6, 6, -1),$$
$$\vec{v}_B = (25, -6, 6),$$
$$\vec{v}_C = (43, 4, 5).$$

**Задача К-29.25.**

4

$$A = (1, 0, 1), B = (2, 2, 2), C = (2, 2, 1),$$
$$\vec{v}_A = (8, 4, 1),$$
$$\vec{v}_B = (31, -12, 10),$$
$$\vec{v}_C = (36, -10, 10).$$

**Задача К-29.27.**

4

$$A = (0, 1, 1), B = (1, 1, 1), C = (1, 2, 1),$$
$$\vec{v}_A = (-6, -4, 3),$$
$$\vec{v}_B = (-6, 3, 9),$$
$$\vec{v}_C = (-13, 3, 15).$$

**Задача К-29.16.**

4

$$A = (0, 1, 0), B = (3, 3, 0), C = (2, 0, 1),$$
$$\vec{v}_A = (-7, -3, 3),$$
$$\vec{v}_B = (7, -24, 33),$$
$$\vec{v}_C = (-20, -23, 9).$$

**Задача К-29.18.**

4

$$A = (1, 2, 2), B = (3, 0, 0), C = (0, 0, -1),$$
$$\vec{v}_A = (6, -7, -3),$$
$$\vec{v}_B = (48, 19, 13),$$
$$\vec{v}_C = (58, -12, -17).$$

**Задача К-29.20.**

4

$$A = (1, 2, 2), B = (0, 0, 2), C = (1, 2, 1),$$
$$\vec{v}_A = (6, -2, 4),$$
$$\vec{v}_B = (20, -9, 0),$$
$$\vec{v}_C = (2, 2, 4).$$

**Задача К-29.22.**

4

$$A = (1, 1, 2), B = (1, 0, 2), C = (-1, 1, 1),$$
$$\vec{v}_A = (4, -3, -4),$$
$$\vec{v}_B = (10, -3, -1),$$
$$\vec{v}_C = (-2, -18, 8).$$

**Задача К-29.24.**

4

$$A = (2, 0, 1), B = (2, 0, 2), C = (3, 0, 1),$$
$$\vec{v}_A = (-7, -5, -1),$$
$$\vec{v}_B = (-2, -7, -1),$$
$$\vec{v}_C = (-7, -19, -6).$$

**Задача К-29.26.**

4

$$A = (0, 0, 0), B = (1, 2, 2), C = (2, 2, 0),$$
$$\vec{v}_A = (-3, -5, 3),$$
$$\vec{v}_B = (3, -20, 15),$$
$$\vec{v}_C = (11, -19, 19).$$

**Задача К-29.28.**

4

$$A = (0, 0, 0), B = (2, -1, 1), C = (0, 1, 1),$$
$$\vec{v}_A = (-8, -6, -4),$$
$$\vec{v}_B = (-24, -27, 7),$$
$$\vec{v}_C = (0, -3, -7).$$

**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	-12
2	2	3	-6	7	9
3	4	-8	-8	12	76
4	-2	6	9	11	-34
5	-6	6	-7	11	39
6	2	4	-4	6	2
7	3	-6	-6	9	-45
8	2	-6	9	11	-23
9	1	12	12	17	-52
10	2	-10	-11	15	57
11	8	-9	12	17	20
12	-3	-6	6	9	42
13	-1	-12	12	17	76
14	-8	9	12	17	-139
15	-2	4	4	6	-24
16	6	-6	-7	11	-45
17	2	10	11	15	-93
18	2	-10	11	15	49
19	-3	6	6	9	30
20	4	4	7	9	44
21	3	4	-12	13	74
22	-3	6	6	9	-54
23	-2	5	14	15	4
24	2	5	-14	15	-25
25	2	-5	-14	15	-18
26	4	-4	-7	9	-13
27	6	-6	7	11	9
28	-3	-4	-12	13	96

К-29 файл о29к4А