

## Уравнение Лагранжа. Определение ускорения

Дано выражение кинетической энергии и обобщенной силы механической системы с одной степенью свободы. В некоторый момент известны значения обобщенной координаты  $x$  и скорости  $\dot{x}$ . Найти ускорение  $\ddot{x}$ .

### Задача 32.1.

3

$$T = \dot{x}^2(8 + 9 \sin 2x + 6 \sin^2 x)$$

$$Q = 6, x = 5, \dot{x} = 1.$$

### Задача 32.2.

3

$$T = \dot{x}^2(3 + 10 \cos x + 9 \cos^2 x)$$

$$Q = 1, x = 2, \dot{x} = 4.$$

### Задача 32.3.

3

$$T = \dot{x}^2(1 + 4 \sin x + 2 \cos x)$$

$$Q = 7, x = 0, \dot{x} = 9.$$

### Задача 32.4.

3

$$T = \dot{x}^2(1 + 2 \sin^2 x + 2 \cos x)$$

$$Q = 9, x = -1, \dot{x} = 8.$$

### Задача 32.5.

3

$$T = \dot{x}^2(3 + 9 \sin 2x + 10 \sin x)$$

$$Q = 9, x = 1, \dot{x} = 3.$$

### Задача 32.6.

3

$$T = \dot{x}^2(8 + 7 \sin x + 4 \cos x)$$

$$Q = 4, x = 6, \dot{x} = 9.$$

### Задача 32.7.

3

$$T = \dot{x}^2(3 + 2 \sin^2 x + 9 \cos x)$$

$$Q = 4, x = 1, \dot{x} = 8.$$

### Задача 32.8.

3

$$T = \dot{x}^2(7 + 5 \cos^2 x + 4 \sin^2 x)$$

$$Q = 1, x = 6, \dot{x} = 3.$$

### Задача 32.9.

3

$$T = \dot{x}^2(9 + 6 \sin x + 4 \sin 2x)$$

$$Q = 6, x = 6, \dot{x} = 2.$$

### Задача 32.10.

3

$$T = \dot{x}^2(7 + 8 \cos^2 x + 9 \cos x)$$

$$Q = 3, x = 5, \dot{x} = 2.$$

### Задача 32.11.

3

$$T = \dot{x}^2(3 + 6 \cos^2 x + 7 \cos x)$$

$$Q = 4, x = 1, \dot{x} = 1.$$

### Задача 32.12.

3

$$T = \dot{x}^2(9 + 7 \sin 2x + 6 \sin^2 x)$$

$$Q = 1, x = 6, \dot{x} = 5.$$

### Задача 32.13.

3

$$T = \dot{x}^2(6 + 9 \cos x + 9 \sin 2x)$$

$$Q = 7, x = 3, \dot{x} = 3.$$

### Задача 32.14.

3

$$T = \dot{x}^2(8 + 9 \sin x + 9 \cos x)$$

$$Q = 5, x = 6, \dot{x} = 8.$$

**Задача 32.15.**

3

$$T = \dot{x}^2(4 + 10 \sin 2x + 3 \cos^2 x)$$

$$Q = 2, x = 3, \dot{x} = 3.$$

**Задача 32.16.**

3

$$T = \dot{x}^2(8 + 8 \sin x + 4 \cos x)$$

$$Q = 3, x = 6, \dot{x} = 4.$$

**Задача 32.17.**

3

$$T = \dot{x}^2(6 + 5 \cos^2 x + 7 \sin^2 x)$$

$$Q = 9, x = 5, \dot{x} = 7.$$

**Задача 32.18.**

3

$$T = \dot{x}^2(8 + 3 \sin 2x + 3 \sin^2 x)$$

$$Q = 6, x = 7, \dot{x} = 8.$$

**Задача 32.19.**

3

$$T = \dot{x}^2(9 + 2 \sin^2 x + 7 \sin 2x)$$

$$Q = 2, x = 6, \dot{x} = 4.$$

**Задача 32.20.**

3

$$T = \dot{x}^2(7 + 7 \cos x + 2 \sin 2x)$$

$$Q = 1, x = 4, \dot{x} = 2.$$

**Задача 32.21.**

3

$$T = \dot{x}^2(5 + 3 \sin^2 x + 8 \cos^2 x)$$

$$Q = 8, x = 4, \dot{x} = 9.$$

**Задача 32.22.**

3

$$T = \dot{x}^2(2 + 9 \sin^2 x + 10 \sin 2x)$$

$$Q = 1, x = 0, \dot{x} = 9.$$

**Задача 32.23.**

3

$$T = \dot{x}^2(4 + 2 \sin 2x + 9 \sin^2 x)$$

$$Q = 8, x = 1, \dot{x} = 9.$$

**Задача 32.24.**

3

$$T = \dot{x}^2(6 + 8 \sin x + 5 \sin 2x)$$

$$Q = 7, x = 3, \dot{x} = 9.$$

**Задача 32.25.**

3

$$T = \dot{x}^2(8 + 7 \sin x + 4 \cos^2 x)$$

$$Q = 8, x = 7, \dot{x} = 5.$$

**Задача 32.26.**

3

$$T = \dot{x}^2(6 + 9 \sin 2x + 5 \sin^2 x)$$

$$Q = 1, x = 5, \dot{x} = 1.$$

**Задача 32.27.**

3

$$T = \dot{x}^2(6 + 8 \cos^2 x + 3 \sin x)$$

$$Q = 4, x = 5, \dot{x} = 9.$$

**Задача 32.28.**

3

$$T = \dot{x}^2(7 + 7 \cos x + 3 \cos^2 x)$$

$$Q = 7, x = 6, \dot{x} = 8.$$

**Задача 32.29.**

3

$$T = \dot{x}^2(4 + 9 \cos^2 x + 6 \sin x)$$

$$Q = 5, x = 2, \dot{x} = 2.$$

**Задача 32.30.**

3

$$T = \dot{x}^2(7 + 10 \sin^2 x + 5 \cos^2 x)$$

$$Q = 2, x = 6, \dot{x} = 4.$$

**Уравнение Лагранжа. Определение ускорения**

1	1.413
2	47.223
3	-52.833
4	2.528
5	0.709
6	-31.915
7	20.062
8	-0.161
9	-4.254
10	-2.399
11	0.899
12	-18.719
13	12.638
14	-25.094
15	-21.511
16	-7.172
17	2.427
18	-9.648
19	-15.727
20	-2.028
21	20.160
22	-404.750
23	-21.329
24	-11.272
25	-0.836
26	1.651
27	-55.410
28	-6.708
29	-0.556
30	1.813