# Механизм с двумя степенями свободы

В указанном положении механизма заданы угловые скорости двух его звеньев. Длины звеньев даны в сантиметрах. Стержни, направление которых не указано, считать горизонтальными или вертикальными. Найти угловые скорости всех звеньев механизма.

*Кирсанов М.Н.* **Решебник. Теоретическая механика**/Под ред. А. И. Кириллова.– М.:ФИЗМАТЛИТ, 2008.– 384 с. (с.158.)
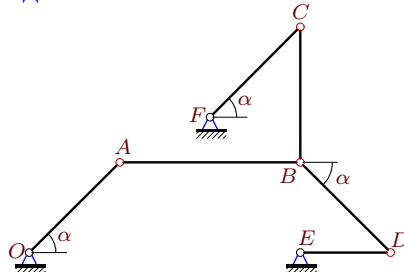
**Задача 25.1.** ₂
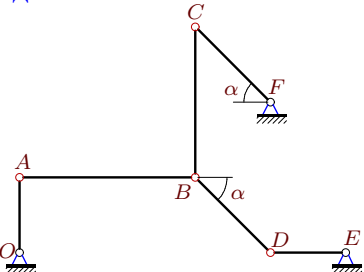
$\omega_{CF_z} = 42\frac{1}{c}$, $\omega_{DE_z} = -14\frac{1}{c}$, $AB = 7$, $BC = 6$, $DE = 3$, $OA = 3$, $CF = BD = 3\sqrt{2}$, $\alpha = 45°$.
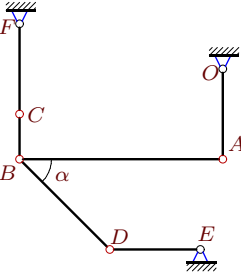
**Задача 25.2.** ₂

$\omega_{CF_z} = 18\frac{1}{c}$, $\omega_{DE_z} = -6\frac{1}{c}$, $AB = 4$, $BC = 3$, $DE = 2$, $OA = CF = BD = 2\sqrt{2}$, $\alpha = 45°$.
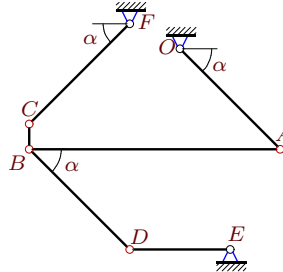
**Задача 25.3.** ₂

$\omega_{CF_z} = 1\frac{1}{c}$, $\omega_{DE_z} = -1\frac{1}{c}$, $AB = 9$, $BC = 2$, $DE = 4$, $OA = 4$, $CF = 4$, $BD = 4\sqrt{2}$, $\alpha = 45°$.
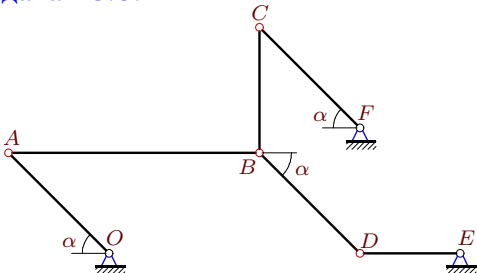
**Задача 25.4.** ₂

$\omega_{OA_z} = -5\frac{1}{c}$, $\omega_{DE_z} = -10\frac{1}{c}$, $AB = 10$, $BC = 1$, $DE = 4$, $OA = CF = BD = 4\sqrt{2}$, $\alpha = 45°$.
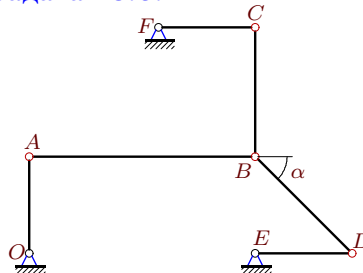
**Задача 25.5.** ₂

$\omega_{OA_z} = 5\frac{1}{c}$, $\omega_{DE_z} = 10\frac{1}{c}$, $AB = 10$, $BC = 5$, $DE = 4$, $OA = CF = BD = 4\sqrt{2}$, $\alpha = 45°$.
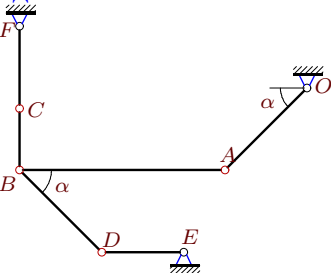
**Задача 25.6.** ₂

$\omega_{OA_z} = -28\frac{1}{c}$, $\omega_{DE_z} = -84\frac{1}{c}$, $AB = 7$, $BC = 4$, $DE = 3$, $OA = 3$, $CF = 3$, $BD = 3\sqrt{2}$, $\alpha = 45°$.
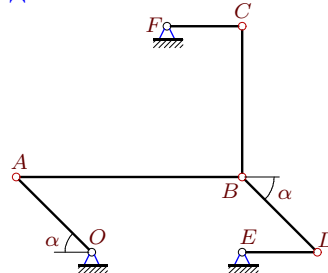
**Задача 25.7.** ₂

$\omega_{OA_z} = -15\frac{1}{c}$, $\omega_{CF_z} = 15\frac{1}{c}$, $AB = 10$, $BC = 3$, $DE = 4$, $CF = 4$, $OA = BD = 4\sqrt{2}$, $\alpha = 45°$.
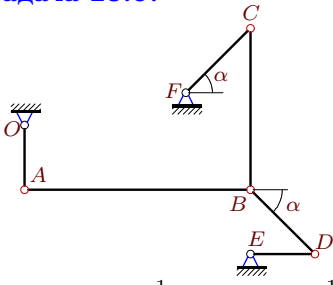
**Задача 25.8.** ₂

$\omega_{OA_z} = -6\frac{1}{c}$, $\omega_{CF_z} = 18\frac{1}{c}$, $AB = 6$, $BC = 4$, $DE = 2$, $CF = 2$, $OA = BD = 2\sqrt{2}$, $\alpha = 45°$.

## Задача 25.9.
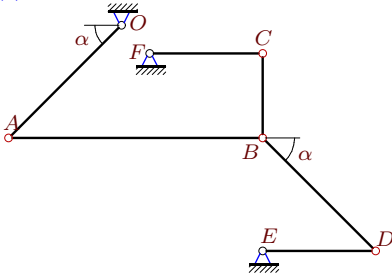


$\omega_{CF_z} = -105\frac{1}{c}$, $\omega_{DE_z} = 35\frac{1}{c}$, $AB = 7$, $BC = 5$, $DE = 2$, $OA = 2$, $CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

## Задача 25.10.



$\omega_{OA_z} = -2\frac{1}{c}$, $\omega_{DE_z} = 2\frac{1}{c}$, $AB = 10$, $BC = 2$, $DE = 3$, $OA = 3$, $CF = 3$, $BD = 3\sqrt{2}$, $\alpha = 45°$.
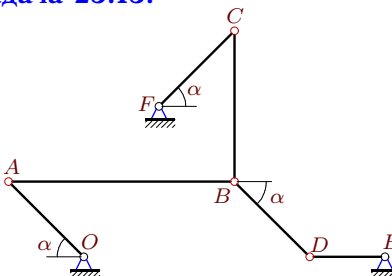
## Задача 25.11.



$\omega_{OA_z} = -3\frac{1}{c}$, $\omega_{CF_z} = -6\frac{1}{c}$, $AB = 9$, $BC = 3$, $DE = 4$, $CF = 4$, $OA = BD = 4\sqrt{2}$, $\alpha = 45°$.

## Задача 25.12.



$\omega_{OA_z} = -4\frac{1}{c}$, $\omega_{DE_z} = 4\frac{1}{c}$, $AB = 4$, $BC = 4$, $DE = 3$, $OA = 3$, $CF = BD = 3\sqrt{2}$, $\alpha = 45°$.
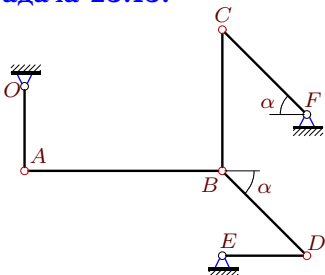
## Задача 25.13.



$\omega_{OA_z} = 1\frac{1}{c}$, $\omega_{CF_z} = -1\frac{1}{c}$, $AB = 6$, $BC = 4$, $DE = 2$, $OA = CF = BD = 2\sqrt{2}$, $\alpha = 45°$.
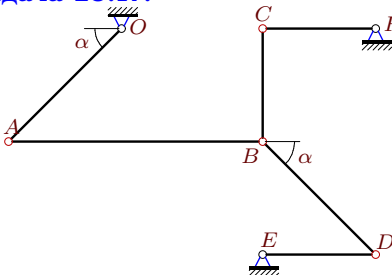
## Задача 25.14.



$\omega_{OA_z} = -63\frac{1}{c}$, $\omega_{DE_z} = 189\frac{1}{c}$, $AB = 9$, $BC = 7$, $DE = 4$, $OA = 4$, $CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

## Задача 25.15.



$\omega_{OA_z} = \omega_{DE_z} = 35\frac{1}{c}$, $AB = 7$, $BC = 5$, $DE = 3$, $OA = 3$, $CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

## Задача 25.16.



$\omega_{CF_z} = \omega_{DE_z} = -9\frac{1}{c}$, $AB = 9$, $BC = 2$, $DE = 2$, $OA = CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

## Задача 25.17.
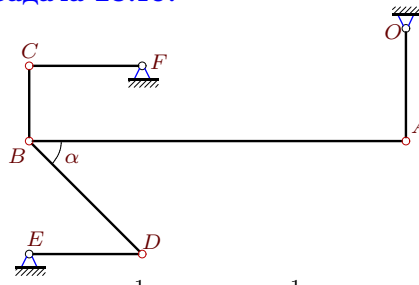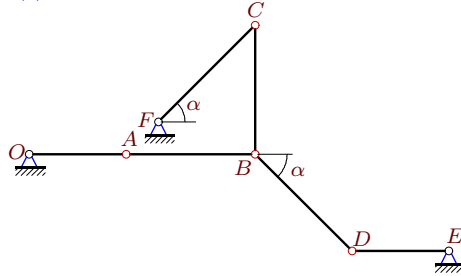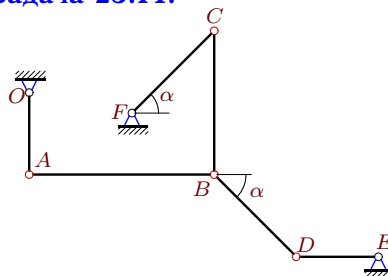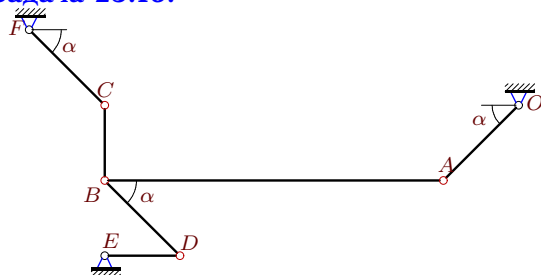


$\omega_{OA_z} = -9\frac{1}{c}$, $\omega_{CF_z} = -18\frac{1}{c}$, $AB = 9$, $BC = 4$, $DE = 4$, $CF = 4$, $OA = BD = 4\sqrt{2}$, $\alpha = 45°$.

## Задача 25.18.
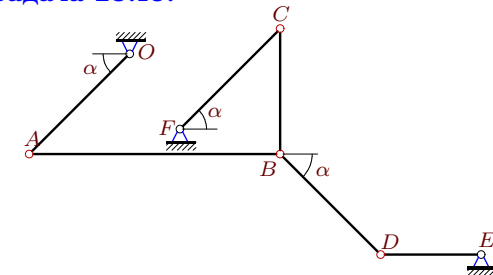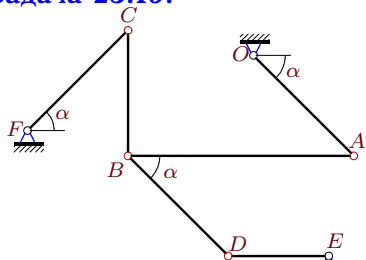


$\omega_{OA_z} = \omega_{DE_z} = -5\frac{1}{c}$, $AB = 10$, $BC = 5$, $DE = 4$, $OA = CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

## Задача 25.19.
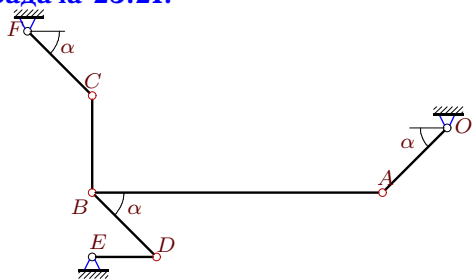


$\omega_{OA_z} = -45\frac{1}{c}$, $\omega_{CF_z} = -90\frac{1}{c}$, $AB = 9$, $BC = 5$,
$DE = 4$, $OA = CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

## Задача 25.20.



$\omega_{OA_z} = -7\frac{1}{c}$, $\omega_{CF_z} = -14\frac{1}{c}$, $AB = 14$, $BC = 1$,
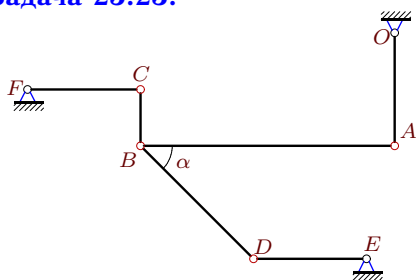$DE = 4$, $OA = CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

## Задача 25.21.



$\omega_{OA_z} = 9\frac{1}{c}$, $\omega_{DE_z} = -27\frac{1}{c}$, $AB = 9$, $BC = 3$,
$DE = 2$, $OA = CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

## Задача 25.22.



$\omega_{OA_z} = -1\frac{1}{c}$, $\omega_{CF_z} = 1\frac{1}{c}$, $AB = 3$, $BC = 5$,
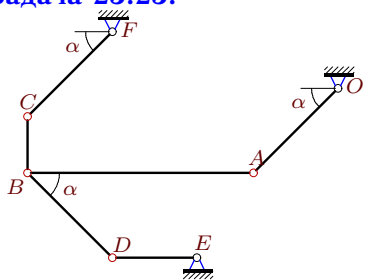$DE = 3$, $OA = CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

## Задача 25.23.



$\omega_{OA_z} = -9\frac{1}{c}$, $\omega_{CF_z} = -18\frac{1}{c}$, $AB = 9$, $BC = 2$,
$DE = 4$, $OA = 4$, $CF = 4$, $BD = 4\sqrt{2}$, $\alpha = 45°$.

## Задача 25.24.



$\omega_{CF_z} = \omega_{DE_z} = 15\frac{1}{c}$, $AB = 5$, $BC = 3$,
$DE = 4$, $CF = 4$, $OA = BD = 4\sqrt{2}$, $\alpha = 45°$.

## Задача 25.25.
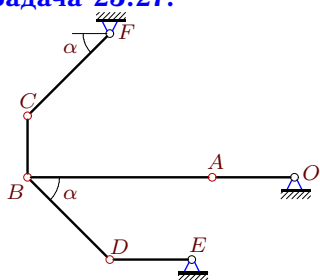


$\omega_{CF_z} = \omega_{DE_z} = -8\frac{1}{c}$, $AB = 8$, $BC = 2$,
$DE = 3$, $OA = CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

## Задача 25.26.



$\omega_{OA_z} = 28\frac{1}{c}$, $\omega_{DE_z} = -28\frac{1}{c}$, $AB = 16$, $BC = 7$,
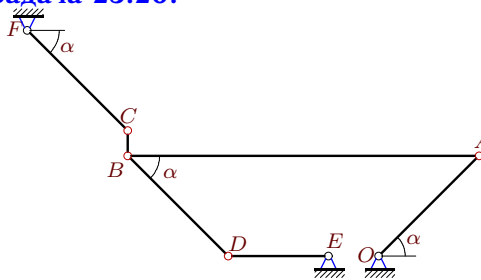$DE = 4$, $OA = CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

## Задача 25.27.



$\omega_{OA_z} = -9\frac{1}{c}$, $\omega_{CF_z} = 27\frac{1}{c}$, $AB = 9$, $BC = 3$,
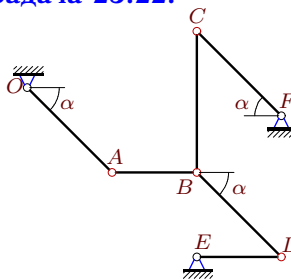$DE = 4$, $OA = 4$, $CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

## Задача 25.28.



$\omega_{OA_z} = -22\frac{1}{c}$, $\omega_{DE_z} = 22\frac{1}{c}$, $AB = 11$, $BC = 6$,
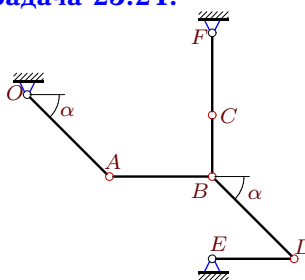$DE = 3$, $OA = CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

## Задача 25.29. 

$\omega_{OA_z} = 1\frac{1}{c}$, $\omega_{DE_z} = 3\frac{1}{c}$, $AB = 9$, $BC = 3$,
$DE = 3$, $OA = CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

## Задача 25.30.

$\omega_{CF_z} = 3\frac{1}{c}$, $\omega_{DE_z} = -3\frac{1}{c}$, $AB = 6$, $BC = 6$,
$DE = 4$, $OA = CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

## Задача 25.31.

$\omega_{OA_z} = 15\frac{1}{c}$, $\omega_{CF_z} = 45\frac{1}{c}$, $AB = 3$, $BC = 5$,
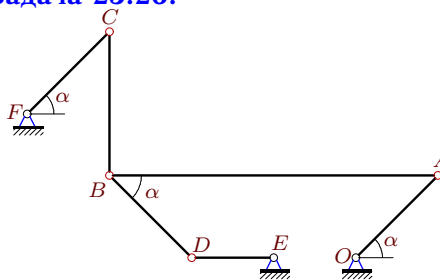$DE = 2$, $OA = CF = BD = 2\sqrt{2}$, $\alpha = 45°$.

## Задача 25.32.

$\omega_{CF_z} = 24\frac{1}{c}$, $\omega_{DE_z} = -12\frac{1}{c}$, $AB = 9$, $BC = 4$,
$DE = 3$, $OA = CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

## Задача 25.33.
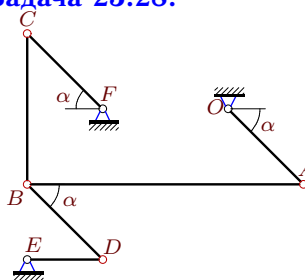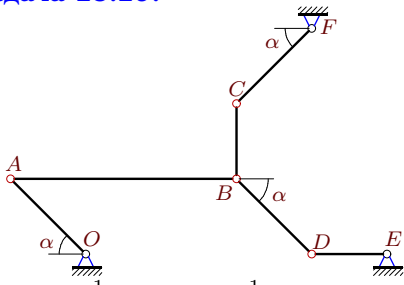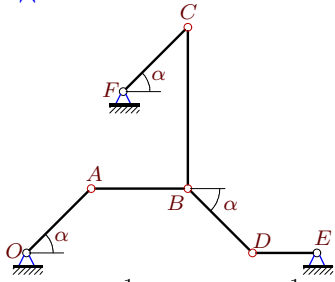
$\omega_{OA_z} = 20\frac{1}{c}$, $\omega_{DE_z} = -60\frac{1}{c}$, $AB = 5$, $BC = 4$,
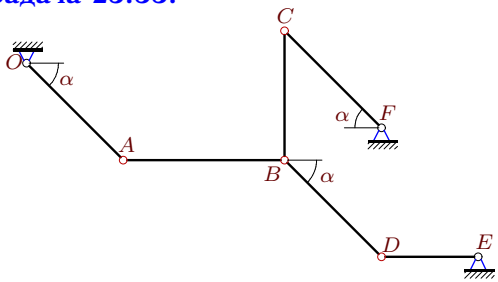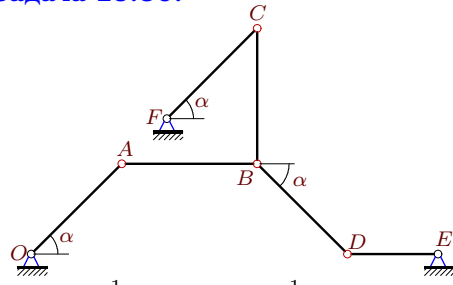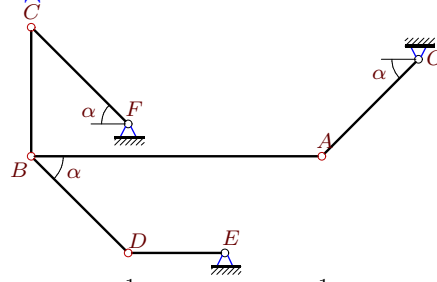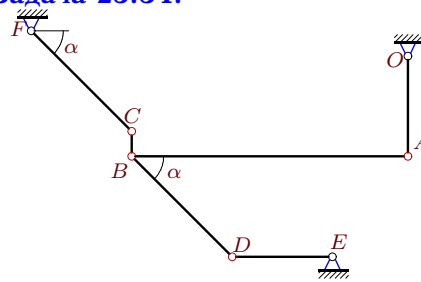$DE = 3$, $OA = CF = BD = 3\sqrt{2}$, $\alpha = 45°$.

## Задача 25.34.

$\omega_{OA_z} = 11\frac{1}{c}$, $\omega_{DE_z} = 33\frac{1}{c}$, $AB = 11$, $BC = 1$,
$DE = 4$, $OA = 4$, $CF = BD = 4\sqrt{2}$, $\alpha = 45°$.

# Механизм с двумя степенями свободы

| № | $\omega_{OA}$ | $\omega_{AB}$ | $\omega_{BC}$ | $\omega_{FC}$ | $\omega_{DB}$ | $\omega_{DE}$ |
|---|---|---|---|---|---|---|
| 1 | 56 | −18 | −7 | − | 56 | − |
| 2 | −24 | 21 | 28 | − | −24 | − |
| 3 | −1 | 0 | −4 | − | 1 | − |
| 4 | − | −4 | 0 | −5 | 5 | − |
| 5 | − | −4 | 8 | 15 | 5 | − |
| 6 | − | −24 | 21 | −56 | −28 | − |
| 7 | − | 6 | −40 | − | 15 | −15 |
| 8 | − | 4 | 3 | − | −6 | 12 |
| 9 | −140 | −30 | −98 | − | 140 | − |
| 10 | − | 0 | −3 | 0 | 2 | − |
| 11 | − | −4 | −4 | − | 3 | −3 |
| 12 | − | 0 | −3 | −4 | 0 | − |
| 13 | − | 0 | −1 | − | 1 | 0 |
| 14 | − | −112 | −180 | −252 | 63 | − |
| 15 | − | 30 | −21 | −70 | −35 | − |
| 16 | 0 | 2 | 9 | − | 0 | − |
| 17 | − | 4 | −9 | − | 9 | 27 |
| 18 | − | −2 | −4 | 0 | 5 | − |
| 19 | − | 20 | −108 | − | 45 | 45 |
| 20 | − | 2 | 84 | − | −7 | 21 |
| 21 | − | 2 | 18 | −18 | −9 | − |
| 22 | − | 0 | 0 | − | 1 | 0 |
| 23 | − | 8 | −18 | − | 9 | 9 |
| 24 | −15 | 12 | −40 | − | 15 | − |
| 25 | 0 | −3 | 12 | − | 0 | − |
| 26 | − | 7 | −16 | 0 | 28 | − |
| 27 | − | 16 | −36 | − | 0 | 27 |
| 28 | − | −6 | −11 | 0 | 22 | − |
| 29 | − | −1 | −5 | 4 | 1 | − |
| 30 | 0 | 2 | 2 | − | 0 | − |
| 31 | − | 20 | 12 | − | 15 | −60 |
| 32 | −36 | 20 | −9 | − | 36 | − |
| 33 | − | 36 | −45 | −80 | −20 | − |
| 34 | − | 8 | 132 | −22 | −11 | − |