

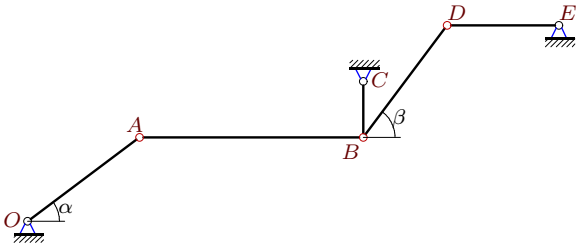
## Кинематический анализ механизма (5 звеньев)

В указанном положении механизма задана угловая скорость одного из его звеньев. Длины звеньев даны в сантиметрах. Найти угловые скорости звеньев механизма.

Кирсанов М.Н. **Решебник. Теоретическая механика**/Под ред. А. И. Кириллова.– М.:ФИЗМАТЛИТ, 2002.– 384 с. (с.158.)

### Задача 23.1.

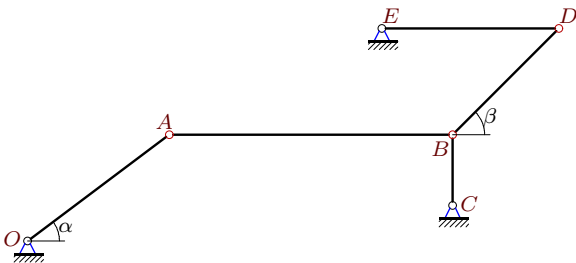
14



$\omega_{OA} = 16$  рад/с,  $OA = 5$ ,  $AB = 8$ ,  $BC = 2$ ,  
 $DE = 4$ ,  $BD = 5$ ,  $\cos \alpha = 0.8$ ,  $\cos \beta = 0.6$ .

### Задача 23.3.

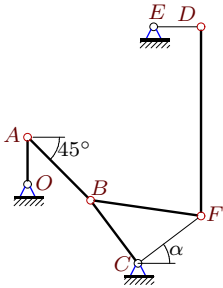
14



$\omega_{OA} = 10$  рад/с,  $OA = 5$ ,  $AB = 8$ ,  $BC = 2$ ,  
 $DE = 5$ ,  $BD = 3\sqrt{2}$ ,  $\cos \alpha = 0.8$ ,  $\beta = 45^\circ$ .

### Задача 23.5.

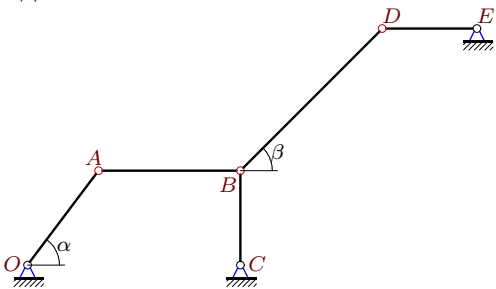
14



$\omega_{OA} = 4$  рад/с,  $OA = 3$ ,  $DF = 12$ ,  $BC = CF = 5$ ,  
 $AB = 4\sqrt{2}$ ,  $DE = 3$ ,  $\cos \alpha = 0.8$ ,  $CB \perp CF$ .

### Задача 23.7.

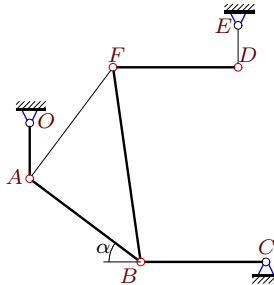
14



$\omega_{OA} = 6$  рад/с,  $OA = 5$ ,  $AB = 6$ ,  $BC = 4$ ,  
 $DE = 4$ ,  $BD = 6\sqrt{2}$ ,  $\cos \alpha = 0.6$ ,  $\beta = 45^\circ$ .

### Задача 23.2.

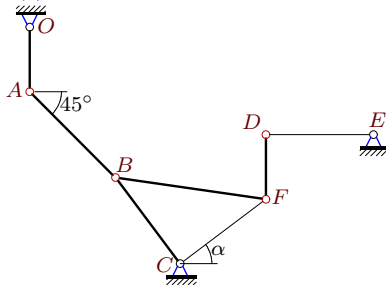
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$\omega_{OA} = 27$  рад/с,  $OA = 4$ ,  $AB = AF = 10$ ,  
 $BC = 9$ ,  $DF = 9$ ,  $DE = 3$ ,  $\cos \alpha = 0.8$ ,  $AB \perp AF$ .

### Задача 23.4.

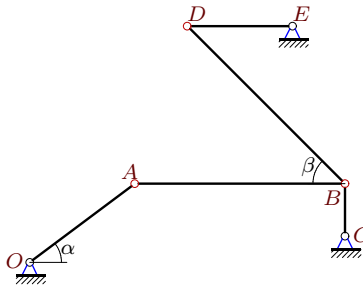
14



$\omega_{OA} = 20$  рад/с,  $OA = 3$ ,  $DF = 3$ ,  $BC = CF = 5$ ,  
 $AB = 4\sqrt{2}$ ,  $DE = 5$ ,  $\cos \alpha = 0.8$ ,  $CB \perp CF$ .

### Задача 23.6.

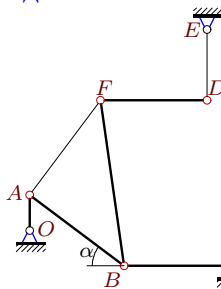
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$\omega_{OA} = 4$  рад/с,  $OA = 5$ ,  $AB = 8$ ,  $BC = 2$ ,  
 $DE = 4$ ,  $BD = 6\sqrt{2}$ ,  $\cos \alpha = 0.8$ ,  $\beta = 45^\circ$ .

### Задача 23.8.

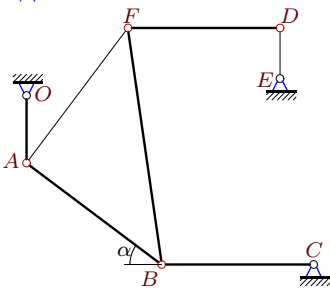
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$\omega_{OA} = 18$  рад/с,  $OA = 3$ ,  $AB = AF = 10$ ,  
 $BC = 9$ ,  $DF = 9$ ,  $DE = 6$ ,  $\cos \alpha = 0.8$ ,  $AB \perp AF$ .

**Задача 23.9.**

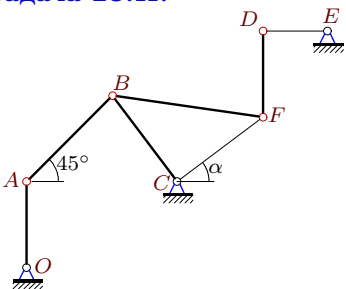
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$\omega_{OA} = 27$  рад/с,  $OA = 4$ ,  $AB=AF=10$ ,  
 $BC = 9$ ,  $DF=9$ ,  $DE=3$ ,  $\cos \alpha=0.8$ ,  $AB \perp AF$ .

**Задача 23.11.**

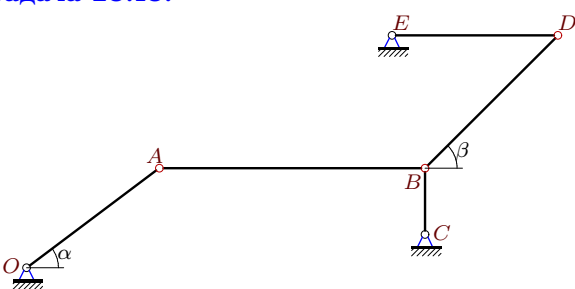
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$\omega_{OA} = 21$  рад/с,  $OA = 4$ ,  $DF=4$ ,  $BC=CF=5$ ,  
 $AB = 4\sqrt{2}$ ,  $DE=3$ ,  $\cos \alpha=0.8$ ,  $CB \perp CF$ .

**Задача 23.13.**

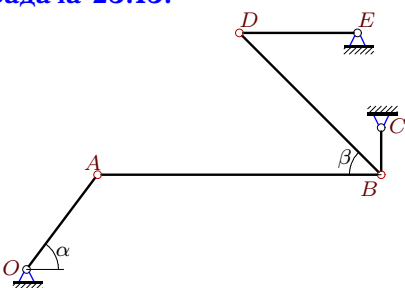
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$\omega_{OA} = 20$  рад/с,  $OA = 5$ ,  $AB = 8$ ,  $BC = 2$ ,  
 $DE = 5$ ,  $BD = 4\sqrt{2}$ ,  $\cos \alpha = 0.8$ ,  $\beta = 45^\circ$ .

**Задача 23.15.**

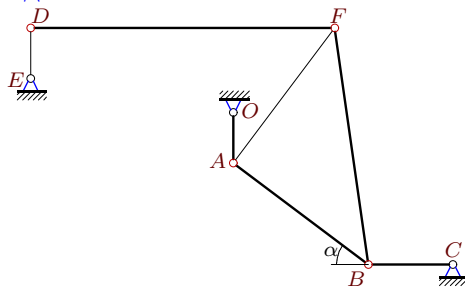
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$\omega_{OA} = 60$  рад/с,  $OA = 5$ ,  $AB = 12$ ,  $BC = 2$ ,  
 $DE = 5$ ,  $BD = 6\sqrt{2}$ ,  $\cos \alpha = 0.6$ ,  $\beta = 45^\circ$ .

**Задача 23.10.**

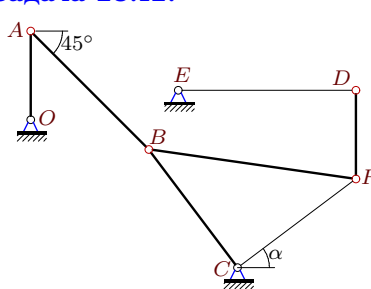
14



$\omega_{OA} = 30$  рад/с,  $OA = 3$ ,  $AB=AF=10$ ,  
 $BC = 5$ ,  $DF=18$ ,  $DE=3$ ,  $\cos \alpha=0.8$ ,  $AB \perp AF$ .

**Задача 23.12.**

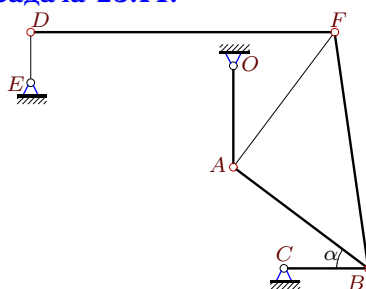
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$\omega_{OA} = 4$  рад/с,  $OA = 3$ ,  $DF=3$ ,  $BC=CF=5$ ,  
 $AB = 4\sqrt{2}$ ,  $DE=6$ ,  $\cos \alpha=0.8$ ,  $CB \perp CF$ .

**Задача 23.14.**

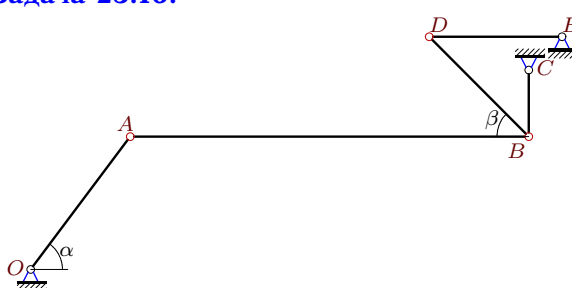
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$\omega_{OA} = 15$  рад/с,  $OA = 6$ ,  $AB=AF=10$ ,  
 $BC = 5$ ,  $DF=18$ ,  $DE=3$ ,  $\cos \alpha=0.8$ ,  $AB \perp AF$ .

**Задача 23.16.**

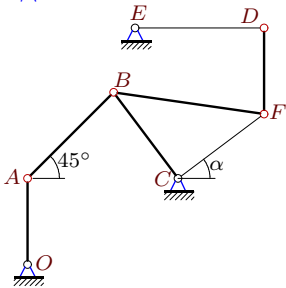
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$\omega_{OA} = 12$  рад/с,  $OA = 5$ ,  $AB = 12$ ,  $BC = 2$ ,  
 $DE = 4$ ,  $BD = 3\sqrt{2}$ ,  $\cos \alpha = 0.6$ ,  $\beta = 45^\circ$ .

**Задача 23.17.**

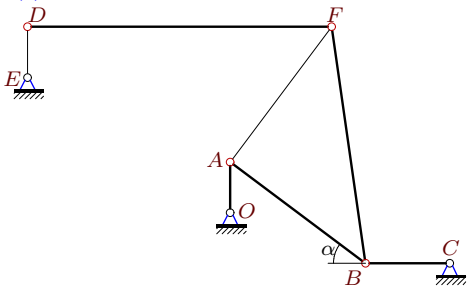
14



$\omega_{OA} = 21$  рад/с,  $OA = 4$ ,  $DF=4$ ,  $BC=CF=5$ ,  
 $AB = 4\sqrt{2}$ ,  $DE=6$ ,  $\cos \alpha=0.8$ ,  $CB \perp CF$ .

**Задача 23.19.**

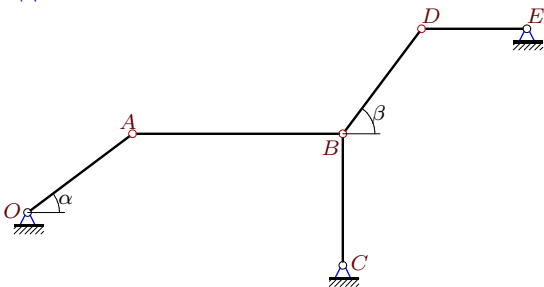
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$\omega_{OA} = 30$  рад/с,  $OA = 3$ ,  $AB=AF=10$ ,  
 $BC = 5$ ,  $DF=18$ ,  $DE=3$ ,  $\cos \alpha=0.8$ ,  $AB \perp AF$ .

**Задача 23.21.**

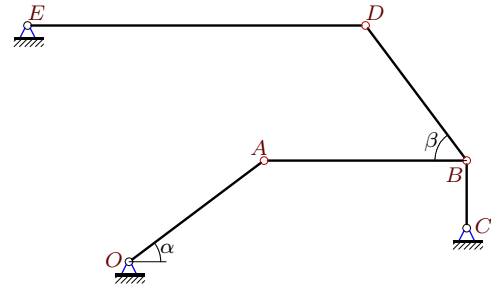
14



$\omega_{OA} = 80$  рад/с,  $OA = 5$ ,  $AB = 8$ ,  $BC = 5$ ,  
 $DE = 4$ ,  $BD = 5$ ,  $\cos \alpha = 0.8$ ,  $\cos \beta = 0.6$ .

**Задача 23.23.**

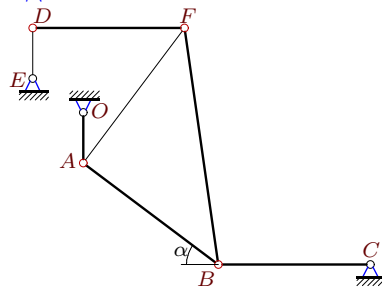
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$\omega_{OA} = 120$  рад/с,  $OA = 5$ ,  $AB = 6$ ,  $BC = 2$ ,  
 $DE = 10$ ,  $BD = 5$ ,  $\cos \alpha = 0.8$ ,  $\cos \beta = 0.6$ .

**Задача 23.18.**

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$\omega_{OA} = 18$  рад/с,  $OA = 3$ ,  $AB=AF=10$ ,  
 $BC = 9$ ,  $DF=9$ ,  $DE=3$ ,  $\cos \alpha=0.8$ ,  $AB \perp AF$ .

**Задача 23.20.**

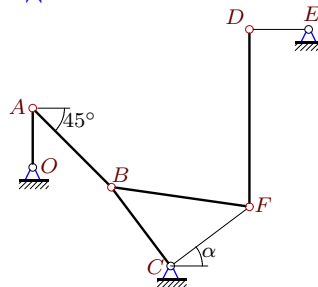
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$\omega_{OA} = 30$  рад/с,  $OA = 5$ ,  $AB = 12$ ,  $BC = 2$ ,  
 $DE = 5$ ,  $BD = 3\sqrt{2}$ ,  $\cos \alpha = 0.8$ ,  $\beta = 45^\circ$ .

**Задача 23.22.**

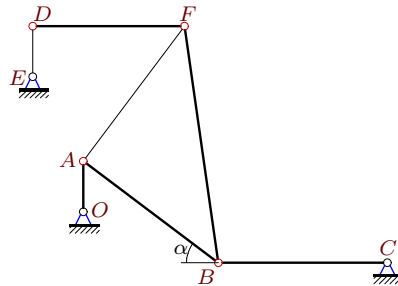
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$\omega_{OA} = 4$  рад/с,  $OA = 3$ ,  $DF=9$ ,  $BC=CF=5$ ,  
 $AB = 4\sqrt{2}$ ,  $DE=3$ ,  $\cos \alpha=0.8$ ,  $CB \perp CF$ .

**Задача 23.24.**

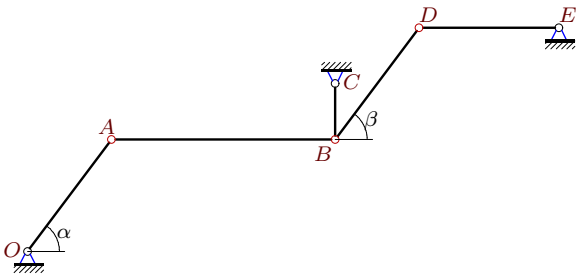
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$\omega_{OA} = 30$  рад/с,  $OA = 3$ ,  $AB=AF=10$ ,  
 $BC = 10$ ,  $DF=9$ ,  $DE=3$ ,  $\cos \alpha=0.8$ ,  $AB \perp AF$ .

**Задача 23.25.**

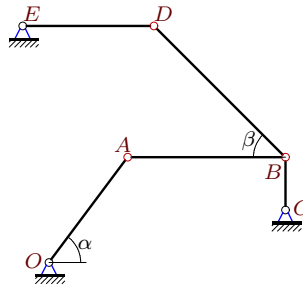
14



$\omega_{OA} = 40$  рад/с,  $OA = 5$ ,  $AB = 8$ ,  $BC = 2$ ,  $DE = 5$ ,  $BD = 5$ ,  $\cos \alpha = 0.6$ ,  $\cos \beta = 0.6$ .

**Задача 23.26.**

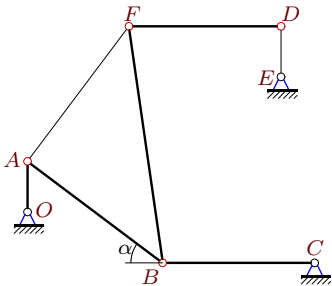
14



$\omega_{OA} = 10$  рад/с,  $OA = 5$ ,  $AB = 6$ ,  $BC = 2$ ,  $DE = 5$ ,  $BD = 5\sqrt{2}$ ,  $\cos \alpha = 0.6$ ,  $\beta = 45^\circ$ .

**Задача 23.27.**

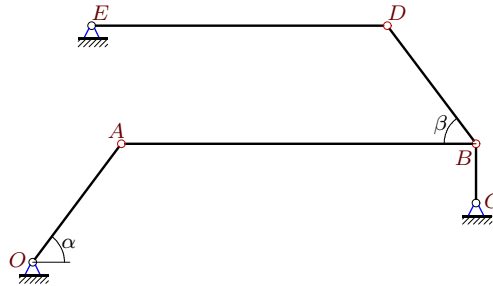
14



$\omega_{OA} = 18$  рад/с,  $OA = 3$ ,  $AB = AF = 10$ ,  $BC = 9$ ,  $DF = 9$ ,  $DE = 3$ ,  $\cos \alpha = 0.8$ ,  $AB \perp AF$ .

**Задача 23.28.**

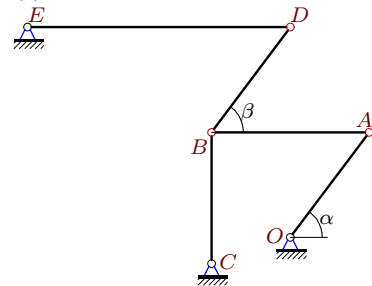
14



$\omega_{OA} = 20$  рад/с,  $OA = 5$ ,  $AB = 12$ ,  $BC = 2$ ,  $DE = 10$ ,  $BD = 5$ ,  $\cos \alpha = 0.6$ ,  $\cos \beta = 0.6$ .

**Задача 23.29.**

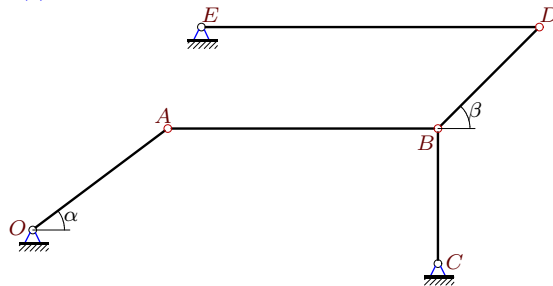
14



$\omega_{OA} = 10$  рад/с,  $OA = 5$ ,  $AB = 6$ ,  $BC = 5$ ,  $DE = 10$ ,  $BD = 5$ ,  $\cos \alpha = 0.6$ ,  $\cos \beta = 0.6$ .

**Задача 23.30.**

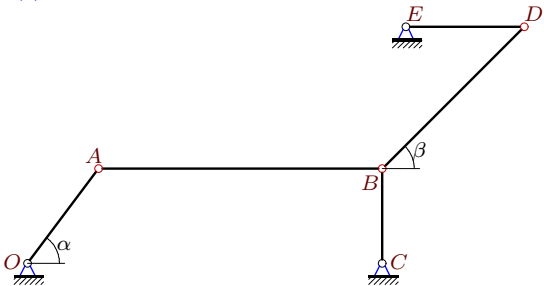
14



$\omega_{OA} = 20$  рад/с,  $OA = 5$ ,  $AB = 8$ ,  $BC = 4$ ,  $DE = 10$ ,  $BD = 3\sqrt{2}$ ,  $\cos \alpha = 0.8$ ,  $\beta = 45^\circ$ .

**Задача 23.31.**

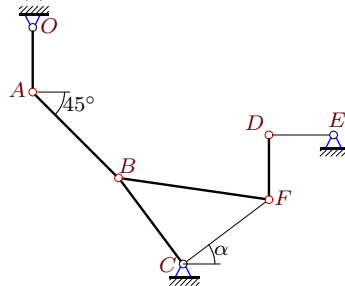
14



$\omega_{OA} = 60$  рад/с,  $OA = 5$ ,  $AB = 12$ ,  $BC = 4$ ,  $DE = 5$ ,  $BD = 6\sqrt{2}$ ,  $\cos \alpha = 0.6$ ,  $\beta = 45^\circ$ .

**Задача 23.32.**

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$\omega_{OA} = 4$  рад/с,  $OA = 3$ ,  $DF = 3$ ,  $BC = CF = 5$ ,  $AB = 4\sqrt{2}$ ,  $DE = 3$ ,  $\cos \alpha = 0.8$ ,  $CB \perp CF$ .

**Кинематический анализ механизма (5 звеньев)**

| №  | $\omega_{AB}$ | $\omega_{BC}$ | $\omega_{DB}$ | $\omega_{DF}$ | $\omega_{DE}$ |
|----|---------------|---------------|---------------|---------------|---------------|
| 1  | 8             | 24            | 12            | —             | 9             |
| 2  | 18            | 16            | —             | 12            | 84            |
| 3  | 5             | 15            | 10            | —             | 6             |
| 4  | 45            | 60            | —             | 60            | 48            |
| 5  | 9             | 12            | —             | 3             | 16            |
| 6  | 2             | 6             | 2             | —             | 3             |
| 7  | 3             | 6             | 4             | —             | 6             |
| 8  | 9             | 8             | —             | 6             | 21            |
| 9  | 18            | 16            | —             | 12            | 84            |
| 10 | 15            | 24            | —             | 5             | 70            |
| 11 | 9             | 12            | —             | 9             | 16            |
| 12 | 9             | 12            | —             | 12            | 8             |
| 13 | 10            | 30            | 15            | —             | 12            |
| 14 | 15            | 24            | —             | 5             | 70            |
| 15 | 15            | 120           | 40            | —             | 48            |
| 16 | 3             | 24            | 16            | —             | 12            |
| 17 | 9             | 12            | —             | 9             | 8             |
| 18 | 9             | 8             | —             | 6             | 42            |
| 19 | 15            | 24            | —             | 5             | 70            |
| 20 | 10            | 45            | 30            | —             | 18            |
| 21 | 40            | 48            | 60            | —             | 45            |
| 22 | 9             | 12            | —             | 4             | 16            |
| 23 | 80            | 180           | 90            | —             | 27            |
| 24 | 15            | 12            | —             | 10            | 70            |
| 25 | 15            | 80            | 40            | —             | 24            |
| 26 | 5             | 20            | 8             | —             | 8             |
| 27 | 9             | 8             | —             | 6             | 42            |
| 28 | 5             | 40            | 20            | —             | 6             |
| 29 | 5             | 8             | 10            | —             | 3             |
| 30 | 10            | 15            | 20            | —             | 6             |
| 31 | 15            | 60            | 40            | —             | 48            |
| 32 | 9             | 12            | —             | 12            | 16            |