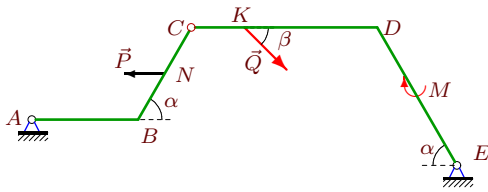


## Составная конструкция

Определить реакции опор конструкции (в кН), состоящей из двух тел. Конструкция расположена в вертикальной плоскости. Дан погонный вес  $\rho$ .

### Задача S7.1.

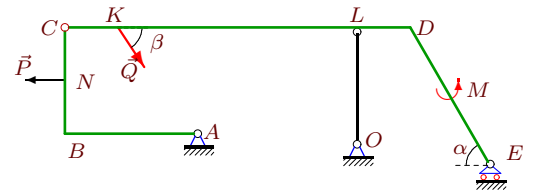
4



$P = 4$  кН,  $Q = 4$  кН,  $M = 3$  кНм,  
 $\rho = 1$  кН/м,  $\alpha = 60^\circ$ ,  $\beta = 30^\circ$ ,  
 $AB = 4$  м,  $BC = 4$  м,  $CD = 7$  м,  
 $DE = 6$  м,  $CN = 2$  м,  $CK = 2$  м.

### Задача S7.2.

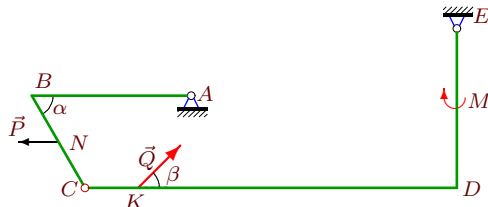
4



$P = 8$  кН,  $Q = 8$  кН,  $M = 9$  кНм,  
 $\rho = 2$  кН/м,  $\alpha = 60^\circ$ ,  $\beta = 75^\circ$ ,  
 $AB = 5$  м,  $BC = 4$  м,  $CD = 13$  м,  
 $DE = 6$  м,  $CN = 2$  м,  $CK = 2$  м.  $LD = 2$  м

### Задача S7.3.

4



$P = 5$  кН,  $Q = 2$  кН,  $M = 3$  кНм,  
 $\rho = 1$  кН/м,  $\alpha = 60^\circ$ ,  $\beta = 45^\circ$ ,  
 $AB = 6$  м,  $BC = 4$  м,  $CD = 14$  м,  
 $DE = 6$  м,  $CN = 2$  м,  $CK = 2$  м.

### Задача S7.4.

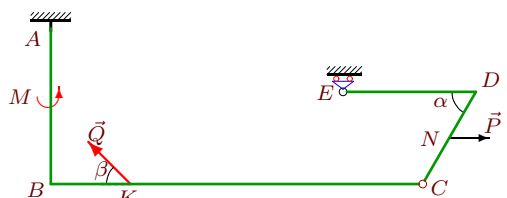
4



$P = 9$  кН,  $Q = 9$  кН,  $M = 9$  кНм,  
 $\rho = 3$  кН/м,  $\alpha = 60^\circ$ ,  $\beta = 75^\circ$ ,  
 $AB = 4$  м,  $BC = 14$  м,  $CD = 4$  м,  
 $DE = 5$  м,  $CN = 2$  м,  $BK = 3$  м.

### Задача S7.5.

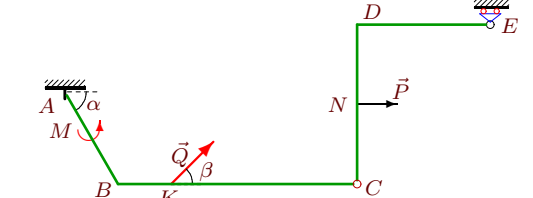
4



$P = 7$  кН,  $Q = 7$  кН,  $M = 5$  кНм,  
 $\rho = 3$  кН/м,  $\alpha = 60^\circ$ ,  $\beta = 45^\circ$ ,  
 $AB = 6$  м,  $BC = 14$  м,  $CD = 4$  м,  
 $DE = 5$  м,  $CN = 2$  м,  $BK = 3$  м.

### Задача S7.6.

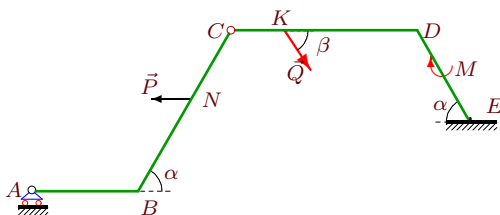
4



$P = 7$  кН,  $Q = 2$  кН,  $M = 5$  кНм,  
 $\rho = 3$  кН/м,  $\alpha = 60^\circ$ ,  $\beta = 45^\circ$ ,  
 $AB = 4$  м,  $BC = 9$  м,  $CD = 6$  м,  
 $DE = 5$  м,  $CN = 3$  м,  $BK = 2$  м.

### Задача S7.7.

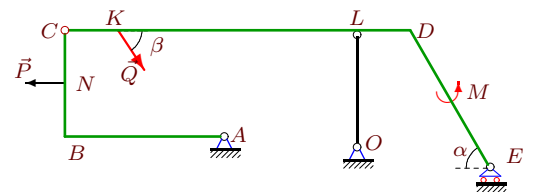
4



$P = 8$  кН,  $Q = 4$  кН,  $M = 9$  кНм,  
 $\rho = 3$  кН/м,  $\alpha = 60^\circ$ ,  $\beta = 60^\circ$ ,  
 $AB = 4$  м,  $BC = 7$  м,  $CD = 7$  м,  
 $DE = 4$  м,  $CN = 3$  м,  $CK = 2$  м.

### Задача S7.8.

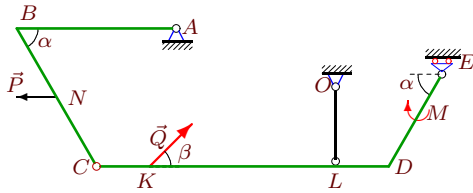
4



$P = 7$  кН,  $Q = 7$  кН,  $M = 7$  кНм,  
 $\rho = 2$  кН/м,  $\alpha = 60^\circ$ ,  $\beta = 60^\circ$ ,  
 $AB = 6$  м,  $BC = 4$  м,  $CD = 13$  м,  
 $DE = 6$  м,  $CN = 2$  м,  $CK = 2$  м.  $LD = 2$  м

**Задача S7.9.**

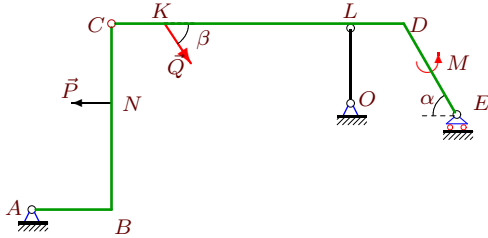
4



$P = 6 \text{ кН}, Q = 3 \text{ кН}, M = 6 \text{ кНм},$   
 $\rho = 2 \text{ кН/м}, \alpha = 60^\circ, \beta = 45^\circ,$   
 $AB = 6 \text{ м}, BC = 6 \text{ м}, CD = 11 \text{ м},$   
 $DE = 4 \text{ м}, CN = 3 \text{ м}, CK = 2 \text{ м}. LD = 2 \text{ м}$

**Задача S7.11.**

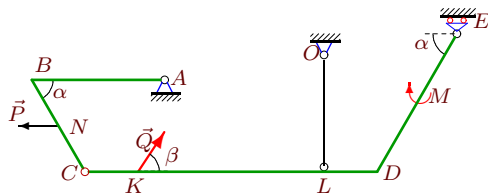
4



$P = 7 \text{ кН}, Q = 9 \text{ кН}, M = 7 \text{ кНм},$   
 $\rho = 2 \text{ кН/м}, \alpha = 60^\circ, \beta = 60^\circ,$   
 $AB = 3 \text{ м}, BC = 7 \text{ м}, CD = 11 \text{ м},$   
 $DE = 4 \text{ м}, CN = 3 \text{ м}, CK = 2 \text{ м}. LD = 2 \text{ м}$

**Задача S7.13.**

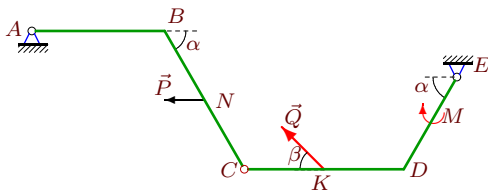
4



$P = 8 \text{ кН}, Q = 5 \text{ кН}, M = 6 \text{ кНм},$   
 $\rho = 2 \text{ кН/м}, \alpha = 60^\circ, \beta = 75^\circ,$   
 $AB = 5 \text{ м}, BC = 4 \text{ м}, CD = 11 \text{ м},$   
 $DE = 6 \text{ м}, CN = 2 \text{ м}, CK = 2 \text{ м}. LD = 2 \text{ м}$

**Задача S7.15.**

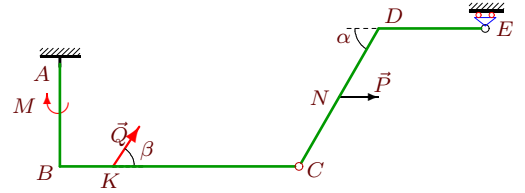
4



$P = 4 \text{ кН}, Q = 3 \text{ кН}, M = 3 \text{ кНм},$   
 $\rho = 1 \text{ кН/м}, \alpha = 60^\circ, \beta = 30^\circ,$   
 $AB = 5 \text{ м}, BC = 6 \text{ м}, CD = 6 \text{ м},$   
 $DE = 4 \text{ м}, CN = 3 \text{ м}, CK = 3 \text{ м}.$

**Задача S7.10.**

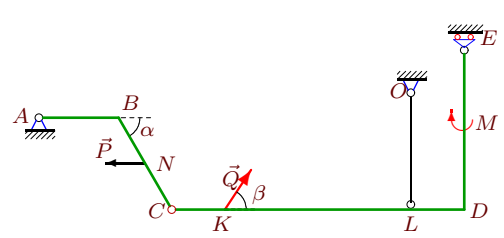
4



$P = 8 \text{ кН}, Q = 8 \text{ кН}, M = 9 \text{ кНм},$   
 $\rho = 3 \text{ кН/м}, \alpha = 60^\circ, \beta = 60^\circ,$   
 $AB = 4 \text{ м}, BC = 9 \text{ м}, CD = 6 \text{ м},$   
 $DE = 4 \text{ м}, CN = 3 \text{ м}, BK = 2 \text{ м}.$

**Задача S7.12.**

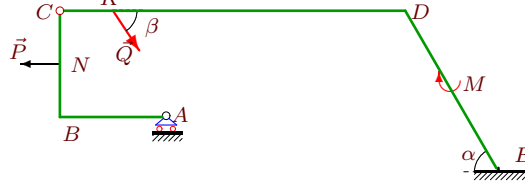
4



$P = 8 \text{ кН}, Q = 2 \text{ кН}, M = 6 \text{ кНм},$   
 $\rho = 2 \text{ кН/м}, \alpha = 60^\circ, \beta = 75^\circ,$   
 $AB = 3 \text{ м}, BC = 4 \text{ м}, CD = 11 \text{ м},$   
 $DE = 6 \text{ м}, CN = 2 \text{ м}, CK = 2 \text{ м}. LD = 2 \text{ м}$

**Задача S7.14.**

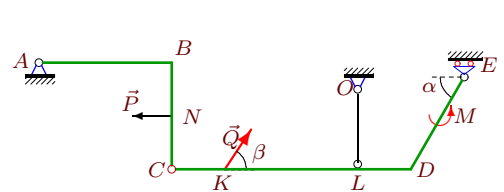
4



$P = 9 \text{ кН}, Q = 6 \text{ кН}, M = 9 \text{ кНм},$   
 $\rho = 3 \text{ кН/м}, \alpha = 60^\circ, \beta = 75^\circ,$   
 $AB = 4 \text{ м}, BC = 4 \text{ м}, CD = 13 \text{ м},$   
 $DE = 7 \text{ м}, CN = 2 \text{ м}, CK = 2 \text{ м}.$

**Задача S7.16.**

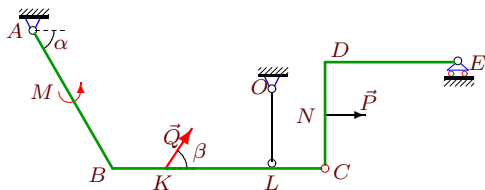
4



$P = 7 \text{ кН}, Q = 8 \text{ кН}, M = 7 \text{ кНм},$   
 $\rho = 2 \text{ кН/м}, \alpha = 60^\circ, \beta = 60^\circ,$   
 $AB = 5 \text{ м}, BC = 4 \text{ м}, CD = 9 \text{ м},$   
 $DE = 4 \text{ м}, CN = 2 \text{ м}, CK = 2 \text{ м}. LD = 2 \text{ м}$

**Задача S7.17.**

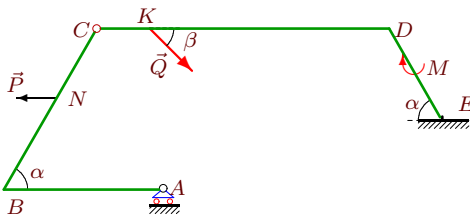
4



$P = 8 \text{ кН}, Q = 2 \text{ кН}, M = 9 \text{ кНм},$   
 $\rho = 2 \text{ кН/м}, \alpha = 60^\circ, \beta = 75^\circ,$   
 $AB = 6 \text{ м}, BC = 8 \text{ м}, CD = 4 \text{ м},$   
 $DE = 5 \text{ м}, CN = 2 \text{ м}, BK = 2 \text{ м}. LC = 2 \text{ м}.$

**Задача S7.19.**

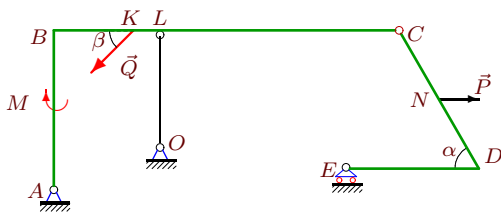
4



$P = 7 \text{ кН}, Q = 6 \text{ кН}, M = 9 \text{ кНм},$   
 $\rho = 3 \text{ кН/м}, \alpha = 60^\circ, \beta = 45^\circ,$   
 $AB = 6 \text{ м}, BC = 7 \text{ м}, CD = 11 \text{ м},$   
 $DE = 4 \text{ м}, CN = 3 \text{ м}, CK = 2 \text{ м}.$

**Задача S7.21.**

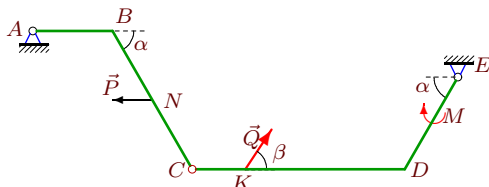
4



$P = 5 \text{ кН}, Q = 6 \text{ кН}, M = 6 \text{ кНм},$   
 $\rho = 2 \text{ кН/м}, \alpha = 60^\circ, \beta = 30^\circ,$   
 $AB = 6 \text{ м}, BC = 13 \text{ м}, CD = 6 \text{ м},$   
 $DE = 5 \text{ м}, CN = 3 \text{ м}, BK = 3 \text{ м}. LC = 9 \text{ м}.$

**Задача S7.23.**

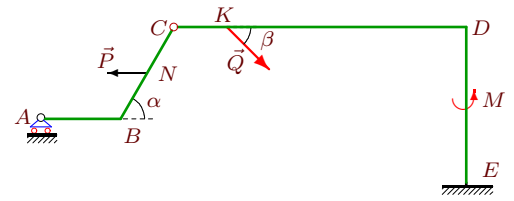
4



$P = 7 \text{ кН}, Q = 4 \text{ кН}, M = 3 \text{ кНм},$   
 $\rho = 1 \text{ кН/м}, \alpha = 60^\circ, \beta = 75^\circ,$   
 $AB = 3 \text{ м}, BC = 6 \text{ м}, CD = 8 \text{ м},$   
 $DE = 4 \text{ м}, CN = 3 \text{ м}, CK = 2 \text{ м}.$

**Задача S7.18.**

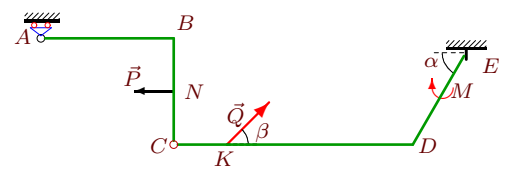
4



$P = 6 \text{ кН}, Q = 1 \text{ кН}, M = 3 \text{ кНм},$   
 $\rho = 3 \text{ кН/м}, \alpha = 60^\circ, \beta = 30^\circ,$   
 $AB = 3 \text{ м}, BC = 4 \text{ м}, CD = 11 \text{ м},$   
 $DE = 6 \text{ м}, CN = 2 \text{ м}, CK = 2 \text{ м}.$

**Задача S7.20.**

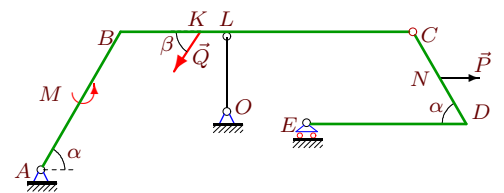
4



$P = 7 \text{ кН}, Q = 8 \text{ кН}, M = 9 \text{ кНм},$   
 $\rho = 3 \text{ кН/м}, \alpha = 60^\circ, \beta = 45^\circ,$   
 $AB = 5 \text{ м}, BC = 4 \text{ м}, CD = 9 \text{ м},$   
 $DE = 4 \text{ м}, CN = 2 \text{ м}, CK = 2 \text{ м}.$

**Задача S7.22.**

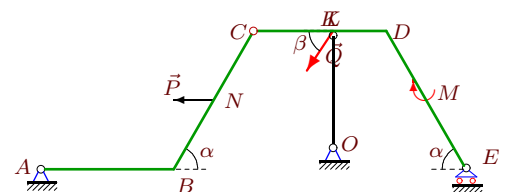
4



$P = 8 \text{ кН}, Q = 3 \text{ кН}, M = 9 \text{ кНм},$   
 $\rho = 2 \text{ кН/м}, \alpha = 60^\circ, \beta = 75^\circ,$   
 $AB = 6 \text{ м}, BC = 11 \text{ м}, CD = 4 \text{ м},$   
 $DE = 6 \text{ м}, CN = 2 \text{ м}, BK = 3 \text{ м}. LC = 7 \text{ м}.$

**Задача S7.24.**

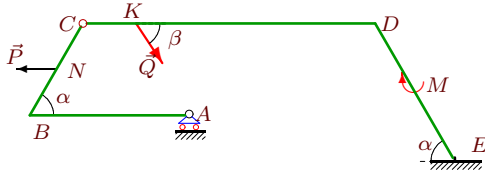
4



$P = 7 \text{ кН}, Q = 4 \text{ кН}, M = 6 \text{ кНм},$   
 $\rho = 2 \text{ кН/м}, \alpha = 60^\circ, \beta = 60^\circ,$   
 $AB = 5 \text{ м}, BC = 6 \text{ м}, CD = 5 \text{ м},$   
 $DE = 6 \text{ м}, CN = 3 \text{ м}, CK = 3 \text{ м}. LD = 2 \text{ м}.$

**Задача S7.25.**

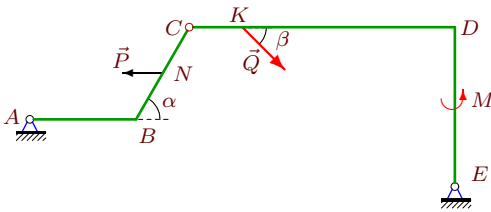
4



$P = 9 \text{ кН}$ ,  $Q = 5 \text{ кН}$ ,  $M = 9 \text{ кНм}$ ,  
 $\rho = 3 \text{ кН/м}$ ,  $\alpha = 60^\circ$ ,  $\beta = 75^\circ$ ,  
 $AB = 6 \text{ м}$ ,  $BC = 4 \text{ м}$ ,  $CD = 11 \text{ м}$ ,  
 $DE = 6 \text{ м}$ ,  $CN = 2 \text{ м}$ ,  $CK = 2 \text{ м}$ .

**Задача S7.27.**

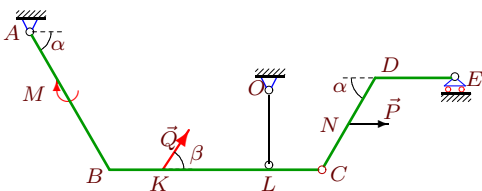
4



$P = 4 \text{ кН}$ ,  $Q = 1 \text{ кН}$ ,  $M = 3 \text{ кНм}$ ,  
 $\rho = 1 \text{ кН/м}$ ,  $\alpha = 60^\circ$ ,  $\beta = 30^\circ$ ,  
 $AB = 4 \text{ м}$ ,  $BC = 4 \text{ м}$ ,  $CD = 10 \text{ м}$ ,  
 $DE = 6 \text{ м}$ ,  $CN = 2 \text{ м}$ ,  $CK = 2 \text{ м}$ .

**Задача S7.29.**

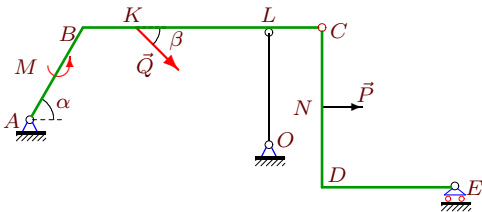
4



$P = 8 \text{ кН}$ ,  $Q = 6 \text{ кН}$ ,  $M = 6 \text{ кНм}$ ,  
 $\rho = 2 \text{ кН/м}$ ,  $\alpha = 60^\circ$ ,  $\beta = 75^\circ$ ,  
 $AB = 6 \text{ м}$ ,  $BC = 8 \text{ м}$ ,  $CD = 4 \text{ м}$ ,  
 $DE = 3 \text{ м}$ ,  $CN = 2 \text{ м}$ ,  $BK = 2 \text{ м}$ ,  $LC = 2 \text{ м}$ .

**Задача S7.31.**

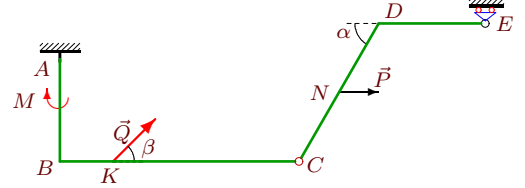
4



$P = 6 \text{ кН}$ ,  $Q = 1 \text{ кН}$ ,  $M = 5 \text{ кНм}$ ,  
 $\rho = 2 \text{ кН/м}$ ,  $\alpha = 60^\circ$ ,  $\beta = 45^\circ$ ,  
 $AB = 4 \text{ м}$ ,  $BC = 9 \text{ м}$ ,  $CD = 6 \text{ м}$ ,  
 $DE = 5 \text{ м}$ ,  $CN = 3 \text{ м}$ ,  $BK = 2 \text{ м}$ ,  $LC = 2 \text{ м}$ .

**Задача S7.26.**

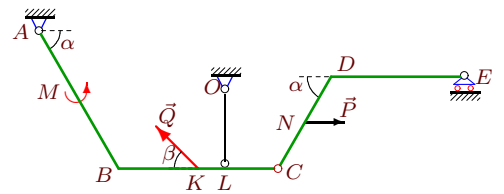
4



$P = 7 \text{ кН}$ ,  $Q = 9 \text{ кН}$ ,  $M = 9 \text{ кНм}$ ,  
 $\rho = 3 \text{ кН/м}$ ,  $\alpha = 60^\circ$ ,  $\beta = 45^\circ$ ,  
 $AB = 4 \text{ м}$ ,  $BC = 9 \text{ м}$ ,  $CD = 6 \text{ м}$ ,  
 $DE = 4 \text{ м}$ ,  $CN = 3 \text{ м}$ ,  $BK = 2 \text{ м}$ .

**Задача S7.28.**

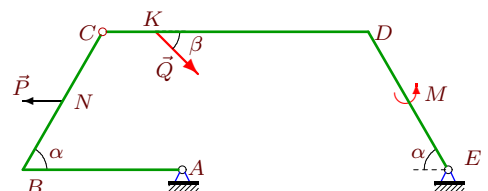
4



$P = 5 \text{ кН}$ ,  $Q = 5 \text{ кН}$ ,  $M = 3 \text{ кНм}$ ,  
 $\rho = 2 \text{ кН/м}$ ,  $\alpha = 60^\circ$ ,  $\beta = 30^\circ$ ,  
 $AB = 6 \text{ м}$ ,  $BC = 6 \text{ м}$ ,  $CD = 4 \text{ м}$ ,  
 $DE = 5 \text{ м}$ ,  $CN = 2 \text{ м}$ ,  $BK = 3 \text{ м}$ ,  $LC = 2 \text{ м}$ .

**Задача S7.30.**

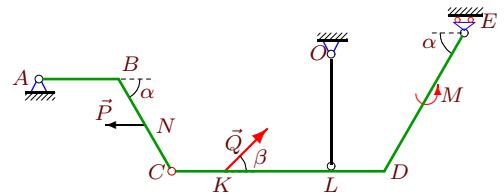
4



$P = 5 \text{ кН}$ ,  $Q = 5 \text{ кН}$ ,  $M = 5 \text{ кНм}$ ,  
 $\rho = 1 \text{ кН/м}$ ,  $\alpha = 60^\circ$ ,  $\beta = 45^\circ$ ,  
 $AB = 6 \text{ м}$ ,  $BC = 6 \text{ м}$ ,  $CD = 10 \text{ м}$ ,  
 $DE = 6 \text{ м}$ ,  $CN = 3 \text{ м}$ ,  $CK = 2 \text{ м}$ .

**Задача S7.32.**

4



$P = 6 \text{ кН}$ ,  $Q = 3 \text{ кН}$ ,  $M = 5 \text{ кНм}$ ,  
 $\rho = 2 \text{ кН/м}$ ,  $\alpha = 60^\circ$ ,  $\beta = 45^\circ$ ,  
 $AB = 3 \text{ м}$ ,  $BC = 4 \text{ м}$ ,  $CD = 8 \text{ м}$ ,  
 $DE = 6 \text{ м}$ ,  $CN = 2 \text{ м}$ ,  $CK = 2 \text{ м}$ ,  $LD = 2 \text{ м}$ .

**S7 Ответы.**  
**Составная конструкция**

04.03.2012

|    | $X_A$   | $Y_A$   | $X_E$   | $Y_E$   | $S_{OL}$ | $M$      |
|----|---------|---------|---------|---------|----------|----------|
| 1  | 11.714  | 8.942   | -11.178 | 14.058  | —        |          |
| 2  | 5.929   | 3.456   | —       | -62.705 | 122.976  |          |
| 3  | 35.894  | 29.420  | -32.308 | -0.834  | —        |          |
| 4  | -6.671  | 79.003  | —       | -6.696  | —        | 721.984  |
| 5  | -2.050  | 87.592  | —       | -5.541  | —        | 717.430  |
| 6  | -8.414  | 58.886  | —       | 11.700  | —        | 381.995  |
| 7  | —       | 10.929  | 6.000   | 58.535  | —        | -362.175 |
| 8  | 3.500   | 6.000   | —       | -58.112 | 116.174  |          |
| 9  | 3.879   | -4.478  | —       | -72.113 | 128.470  |          |
| 10 | -12.000 | 46.674  | —       | 15.398  | —        | 200.063  |
| 11 | 2.500   | 1.833   | —       | -69.515 | 125.476  |          |
| 12 | 7.482   | 3.387   | —       | -64.495 | 107.176  |          |
| 13 | 6.706   | 2.125   | —       | -27.614 | 72.660   |          |
| 14 | —       | 10.500  | 7.447   | 79.296  | —        | -769.681 |
| 15 | -4.821  | 8.993   | 11.419  | 10.507  | —        |          |
| 16 | 3.000   | 5.400   | —       | -20.390 | 52.062   |          |
| 17 | -8.518  | 16.437  | —       | 8.200   | 19.431   |          |
| 18 | —       | 6.622   | 5.134   | 65.878  | —        | -377.967 |
| 19 | —       | -11.025 | 2.757   | 99.268  | —        | -957.051 |
| 20 | —       | 10.300  | 1.343   | 50.043  | —        | -306.636 |
| 21 | 0.196   | -65.467 | —       | -5.005  | 133.471  |          |
| 22 | -7.224  | -14.484 | —       | 4.464   | 66.918   |          |
| 23 | -1.618  | 8.182   | 7.583   | 8.954   | —        |          |
| 24 | 9.000   | 12.697  | —       | 3.018   | 31.748   |          |
| 25 | —       | 5.397   | 7.706   | 80.433  | —        | -740.937 |
| 26 | -13.364 | 47.609  | —       | 15.027  | —        | 199.076  |
| 27 | 11.383  | 8.751   | -8.249  | 15.749  | —        |          |
| 28 | -0.670  | 9.085   | —       | 8.809   | 21.606   |          |
| 29 | -9.553  | 14.622  | —       | 8.571   | 13.011   |          |
| 30 | -16.120 | 29.251  | 17.585  | 2.285   | —        |          |
| 31 | -6.707  | 5.900   | —       | 1.400   | 41.407   |          |
| 32 | 3.879   | 5.191   | —       | -7.873  | 42.561   |          |

S7 файл о7s4B

|    |  |
|----|--|
| 1  | $3.46 \cdot X_A - 6 \cdot Y_A + 13.07 = 0;$ $-1.73 \cdot X_A - 16 \cdot Y_A + 163.36 = 0.$ |
| 2  | $11 \cdot Y_E + 6 \cdot S - 48.1 = 0;$ $16 \cdot Y_E + 11 \cdot S - 349.45 = 0.$           |
| 3  | $-3.46 \cdot X_A + 4 \cdot Y_A + 6.66 = 0;$ $2.54 \cdot X_A - 10 \cdot Y_A + 203.17 = 0.$  |
| 4  | $3 \cdot Y_E = -15.59 - 4.5;$ $M_A = 648.33 - 11 \cdot Y_E;$                               |
| 5  | $3 \cdot Y_E = -12.12 - 4.5;$ $M_A = 656.47 - 11 \cdot Y_E;$                               |
| 6  | $-5 \cdot Y_E = -21 - 37.5;$ $M_A = 569.2 - 16 \cdot Y_E;$                                 |
| 7  | $Y_A = 81.97/(7.5);$ $M_E = -542.5 + Y_A(16.5)$  |
| 8  | $10 \cdot Y_E + 5 \cdot S + 0.25 = 0;$ $16 \cdot Y_E + 11 \cdot S - 348.12 = 0.$           |
| 9  | $10 \cdot Y_E + 6 \cdot S - 49.69 = 0;$ $13 \cdot Y_E + 9 \cdot S - 218.76 = 0.$           |
| 10 | $-7 \cdot Y_E = -20.78 - 87;$ $M_A = 446.43 - 16 \cdot Y_E;$                               |
| 11 | $16 \cdot Y_E + 12 \cdot S - 393.47 = 0;$ $13 \cdot Y_E + 9 \cdot S - 225.59 = 0.$         |
| 12 | $16 \cdot Y_E + 14 \cdot S - 468.54 = 0;$ $11 \cdot Y_E + 9 \cdot S - 255.14 = 0.$         |
| 13 | $11 \cdot Y_E + 6 \cdot S - 132.2 = 0;$ $14 \cdot Y_E + 9 \cdot S - 267.34 = 0.$           |
| 14 | $Y_A = -42/(-4);$ $M_E = -900.93 + Y_A(12.5)$  |
| 15 | $-5.2 \cdot X_A - 8 \cdot Y_A + 46.9 = 0;$ $-1.73 \cdot X_A - 16 \cdot Y_A + 135.54 = 0.$  |
| 16 | $16 \cdot Y_E + 12 \cdot S - 298.5 = 0;$ $11 \cdot Y_E + 7 \cdot S - 140.14 = 0.$          |
| 17 | $-5 \cdot Y_E = -16 - 25;$ $9 \cdot Y_A = 7 \cdot Y_E - 5.2 - 350.34;$                     |
| 18 | $Y_A = 33.1/(5);$ $M_E = -483.91 + Y_A(16)$  |
| 19 | $Y_A = 27.56/(-2.5);$ $M_E = -841.28 + Y_A(10.5)$  |
| 20 | $Y_A = 51.5/(5);$ $M_E = -471.44 + Y_A(16)$  |
| 21 | $2 \cdot Y_E = 13 - 23;$ $4 \cdot Y_A = 7 \cdot Y_E + 6 - 478.83;$                         |
| 22 | $4 \cdot Y_E = 13.86 + 4;$ $7 \cdot Y_A = 3 \cdot Y_E + 5.2 - 513.06;$                     |
| 23 | $-5.2 \cdot X_A - 6 \cdot Y_A + 40.69 = 0;$ $-1.73 \cdot X_A - 16 \cdot Y_A + 128.11 = 0.$ |
| 24 | $16 \cdot Y_E + 11 \cdot S - 397.53 = 0;$ $8 \cdot Y_E + 3 \cdot S - 119.4 = 0.$           |
| 25 | $Y_A = -21.59/(-4);$ $M_E = -794.9 + Y_A(10)$  |
| 26 | $-7 \cdot Y_E = -18.19 - 87;$ $M_A = 439.5 - 16 \cdot Y_E;$                                |
| 27 | $3.46 \cdot X_A - 6 \cdot Y_A + 13.07 = 0;$ $-2.54 \cdot X_A - 16 \cdot Y_A + 168.88 = 0.$ |
| 28 | $-7 \cdot Y_E = -8.66 - 53;$ $7 \cdot Y_A = 9 \cdot Y_E - 5.2 - 295.66;$                   |
| 29 | $-5 \cdot Y_E = -13.86 - 29;$ $9 \cdot Y_A = 7 \cdot Y_E - 5.2 - 303.88;$                  |
| 30 | $5.2 \cdot X_A + 3 \cdot Y_A - 4 = 0;$ $0 \cdot X_A - 10 \cdot Y_A + 292.51 = 0.$          |
| 31 | $-5 \cdot Y_E = 18 - 25;$ $9 \cdot Y_A = 7 \cdot Y_E + 3.46 - 412.07;$                     |
| 32 | $16 \cdot Y_E + 11 \cdot S - 342.2 = 0;$ $11 \cdot Y_E + 6 \cdot S - 168.76 = 0.$          |