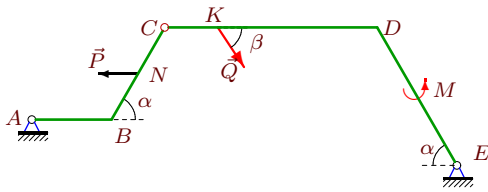


Составная конструкция

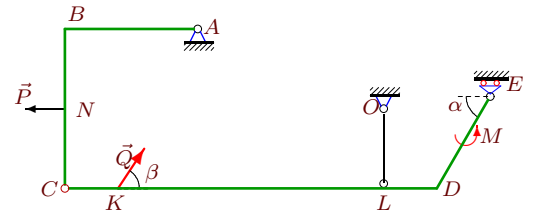
Определить реакции опор конструкции (в кН), состоящей из двух тел. Конструкция расположена в вертикальной плоскости. Дан погонный вес ρ .

Задача S7.1.



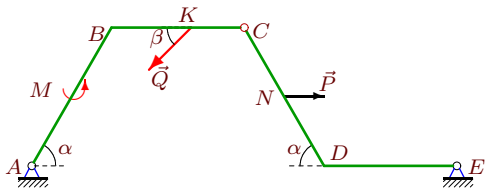
$P = 7$ кН, $Q = 6$ кН, $M = 9$ кНм,
 $\rho = 1$ кН/м, $\alpha = 60^\circ$, $\beta = 75^\circ$,
 $AB = 3$ м, $BC = 4$ м, $CD = 8$ м,
 $DE = 6$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.2.



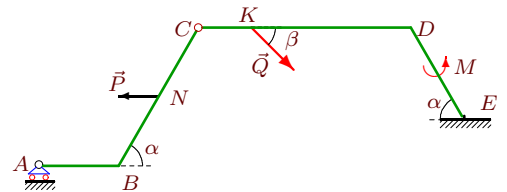
$P = 8$ кН, $Q = 7$ кН, $M = 9$ кНм,
 $\rho = 2$ кН/м, $\alpha = 60^\circ$, $\beta = 75^\circ$,
 $AB = 5$ м, $BC = 6$ м, $CD = 14$ м,
 $DE = 4$ м, $CN = 3$ м, $CK = 2$ м. $LD = 2$ м

Задача S7.3.



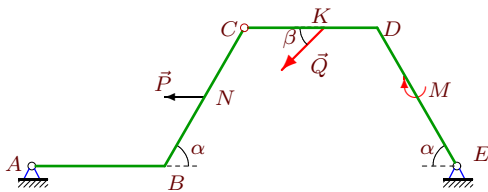
$P = 5$ кН, $Q = 3$ кН, $M = 5$ кНм,
 $\rho = 1$ кН/м, $\alpha = 60^\circ$, $\beta = 45^\circ$,
 $AB = 6$ м, $BC = 5$ м, $CD = 6$ м,
 $DE = 5$ м, $CN = 3$ м, $BK = 3$ м.

Задача S7.4.



$P = 7$ кН, $Q = 6$ кН, $M = 5$ кНм,
 $\rho = 3$ кН/м, $\alpha = 60^\circ$, $\beta = 45^\circ$,
 $AB = 3$ м, $BC = 6$ м, $CD = 8$ м,
 $DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.5.



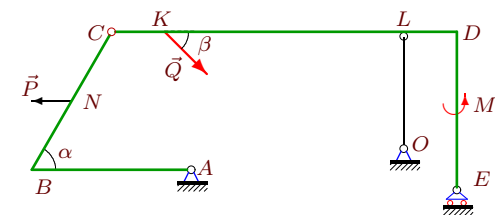
$P = 4$ кН, $Q = 4$ кН, $M = 3$ кНм,
 $\rho = 1$ кН/м, $\alpha = 60^\circ$, $\beta = 30^\circ$,
 $AB = 5$ м, $BC = 6$ м, $CD = 5$ м,
 $DE = 6$ м, $CN = 3$ м, $CK = 3$ м.

Задача S7.6.



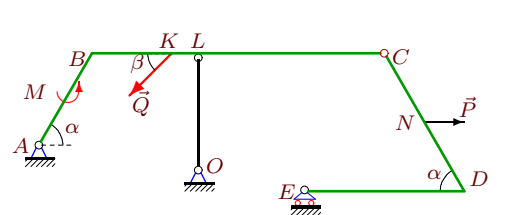
$P = 4$ кН, $Q = 3$ кН, $M = 3$ кНм,
 $\rho = 1$ кН/м, $\alpha = 60^\circ$, $\beta = 30^\circ$,
 $AB = 4$ м, $BC = 12$ м, $CD = 4$ м,
 $DE = 4$ м, $CN = 2$ м, $BK = 3$ м.

Задача S7.7.



$P = 6$ кН, $Q = 1$ кН, $M = 5$ кНм,
 $\rho = 2$ кН/м, $\alpha = 60^\circ$, $\beta = 45^\circ$,
 $AB = 6$ м, $BC = 6$ м, $CD = 13$ м,
 $DE = 6$ м, $CN = 3$ м, $CK = 2$ м. $LD = 2$ м

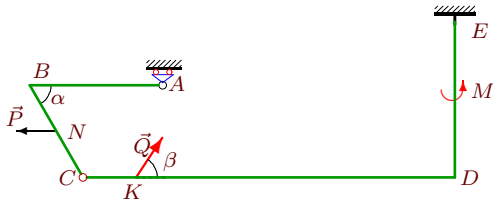
Задача S7.8.



$P = 6$ кН, $Q = 5$ кН, $M = 5$ кНм,
 $\rho = 2$ кН/м, $\alpha = 60^\circ$, $\beta = 45^\circ$,
 $AB = 4$ м, $BC = 11$ м, $CD = 6$ м,
 $DE = 6$ м, $CN = 3$ м, $BK = 3$ м. $LC = 7$ м.

Задача S7.9.

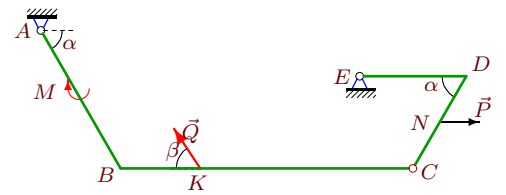
1



$P = 8 \text{ кН}$, $Q = 1 \text{ кН}$, $M = 7 \text{ кНм}$,
 $\rho = 3 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 60^\circ$,
 $AB = 5 \text{ м}$, $BC = 4 \text{ м}$, $CD = 14 \text{ м}$,
 $DE = 6 \text{ м}$, $CN = 2 \text{ м}$, $CK = 2 \text{ м}$.

Задача S7.10.

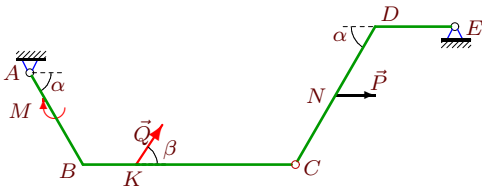
1



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

Задача S7.11.

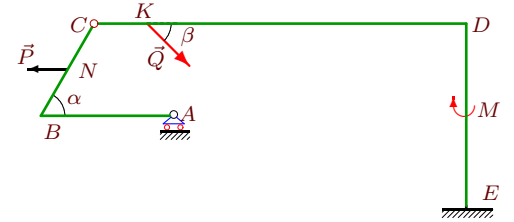
1



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

Задача S7.12.

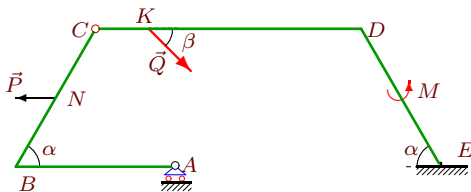
1



$P = 6 \text{ кН}$, $Q = 2 \text{ кН}$, $M = 9 \text{ кНм}$,
 $\rho = 3 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 30^\circ$,
 $AB = 5 \text{ м}$, $BC = 4 \text{ м}$, $CD = 14 \text{ м}$,
 $DE = 7 \text{ м}$, $CN = 2 \text{ м}$, $CK = 2 \text{ м}$.

Задача S7.13.

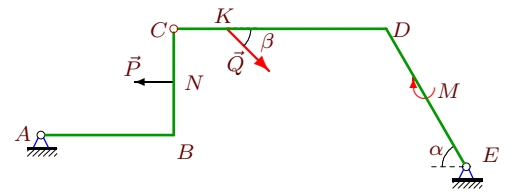
1



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

Задача S7.14.

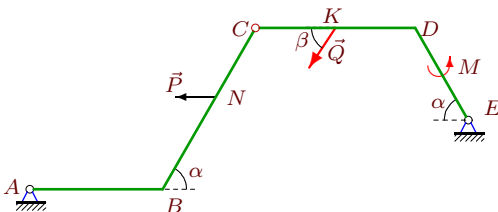
1



$P = 4 \text{ кН}$, $Q = 8 \text{ кН}$, $M = 3 \text{ кНм}$,
 $\rho = 1 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 30^\circ$,
 $AB = 5 \text{ м}$, $BC = 4 \text{ м}$, $CD = 8 \text{ м}$,
 $DE = 6 \text{ м}$, $CN = 2 \text{ м}$, $CK = 2 \text{ м}$.

Задача S7.15.

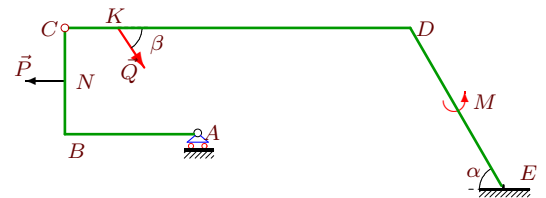
1



$P = 6 \text{ кН}$, $Q = 6 \text{ кН}$, $M = 7 \text{ кНм}$,
 $\rho = 1 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 60^\circ$,
 $AB = 5 \text{ м}$, $BC = 7 \text{ м}$, $CD = 6 \text{ м}$,
 $DE = 4 \text{ м}$, $CN = 3 \text{ м}$, $CK = 3 \text{ м}$.

Задача S7.16.

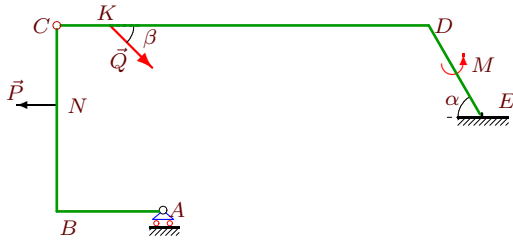
1



$P = 9 \text{ кН}$, $Q = 7 \text{ кН}$, $M = 9 \text{ кНм}$,
 $\rho = 3 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 75^\circ$,
 $AB = 5 \text{ м}$, $BC = 4 \text{ м}$, $CD = 13 \text{ м}$,
 $DE = 7 \text{ м}$, $CN = 2 \text{ м}$, $CK = 2 \text{ м}$.

Задача S7.17.

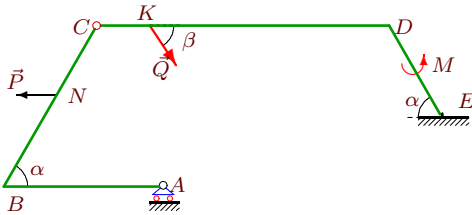
1



$P = 6 \text{ кН}$, $Q = 8 \text{ кН}$, $M = 3 \text{ кНм}$,
 $\rho = 3 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 30^\circ$,
 $AB = 4 \text{ м}$, $BC = 7 \text{ м}$, $CD = 14 \text{ м}$,
 $DE = 4 \text{ м}$, $CN = 3 \text{ м}$, $CK = 2 \text{ м}$.

Задача S7.19.

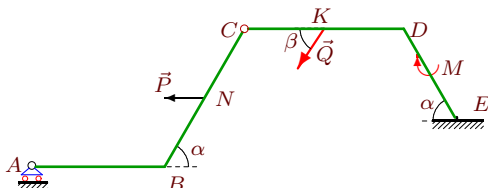
1



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

Задача S7.21.

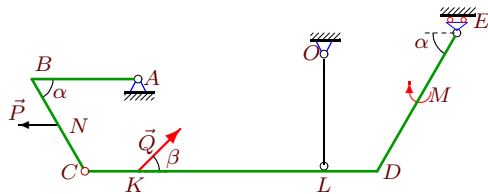
1



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

Задача S7.23.

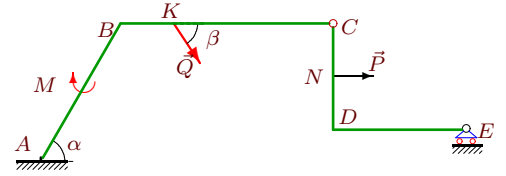
1



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

Задача S7.18.

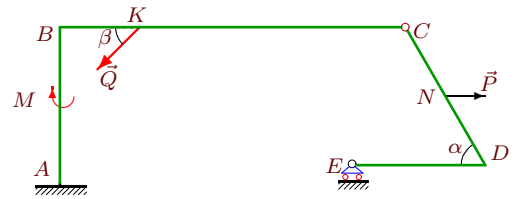
1



$P = 8 \text{ кН}$, $Q = 2 \text{ кН}$, $M = 9 \text{ кНм}$,
 $\rho = 3 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 60^\circ$,
 $AB = 6 \text{ м}$, $BC = 8 \text{ м}$, $CD = 4 \text{ м}$,
 $DE = 5 \text{ м}$, $CN = 2 \text{ м}$, $BK = 2 \text{ м}$.

Задача S7.20.

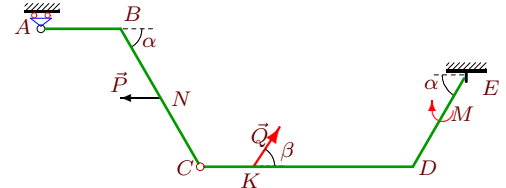
1



$P = 7 \text{ кН}$, $Q = 8 \text{ кН}$, $M = 9 \text{ кНм}$,
 $\rho = 3 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 45^\circ$,
 $AB = 6 \text{ м}$, $BC = 13 \text{ м}$, $CD = 6 \text{ м}$,
 $DE = 5 \text{ м}$, $CN = 3 \text{ м}$, $BK = 3 \text{ м}$.

Задача S7.22.

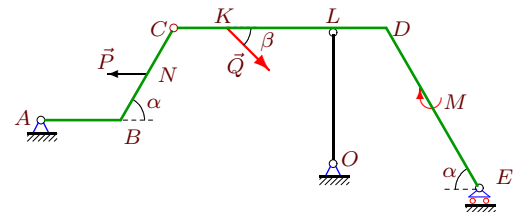
1



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

Задача S7.24.

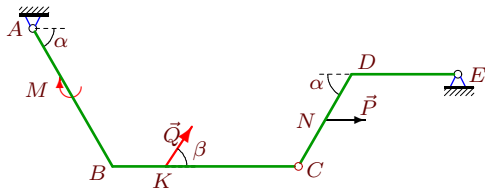
1



$P = 6 \text{ кН}$, $Q = 6 \text{ кН}$, $M = 6 \text{ кНм}$,
 $\rho = 2 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 45^\circ$,
 $AB = 3 \text{ м}$, $BC = 4 \text{ м}$, $CD = 8 \text{ м}$,
 $DE = 7 \text{ м}$, $CN = 2 \text{ м}$, $CK = 2 \text{ м}$, $LD = 2 \text{ м}$

Задача S7.25.

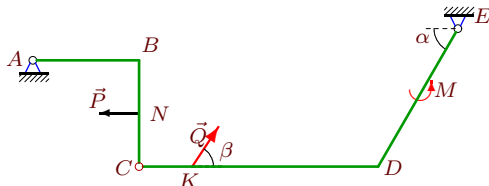
1



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

Задача S7.27.

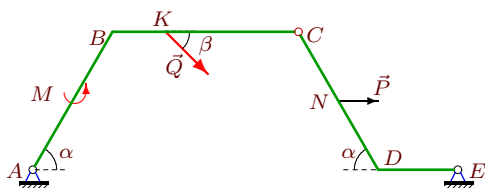
1



$P = 7 \text{ кН}$, $Q = 7 \text{ кН}$, $M = 9 \text{ кНм}$,
 $\rho = 1 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 75^\circ$,
 $AB = 4 \text{ м}$, $BC = 4 \text{ м}$, $CD = 9 \text{ м}$,
 $DE = 6 \text{ м}$, $CN = 2 \text{ м}$, $CK = 2 \text{ м}$.

Задача S7.29.

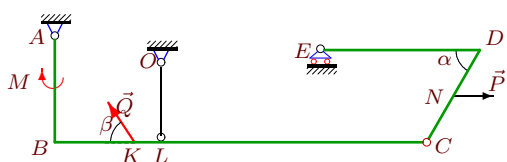
1



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

Задача S7.31.

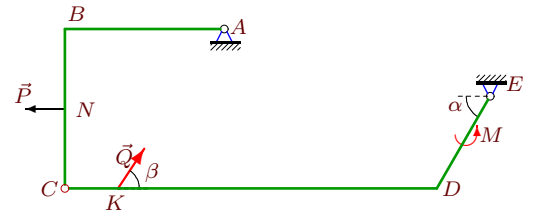
1



$P = 7 \text{ кН}$, $Q = 8 \text{ кН}$, $M = 6 \text{ кНм}$,
 $\rho = 2 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 60^\circ$,
 $AB = 4 \text{ м}$, $BC = 14 \text{ м}$, $CD = 4 \text{ м}$,
 $DE = 6 \text{ м}$, $CN = 2 \text{ м}$, $BK = 3 \text{ м}$, $LC = 10 \text{ м}$.

Задача S7.26.

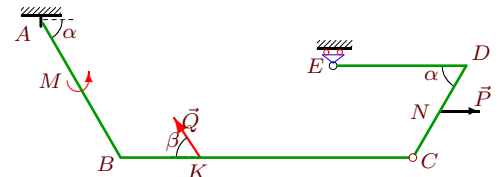
1



$P = 7 \text{ кН}$, $Q = 8 \text{ кН}$, $M = 9 \text{ кНм}$,
 $\rho = 1 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 75^\circ$,
 $AB = 6 \text{ м}$, $BC = 6 \text{ м}$, $CD = 14 \text{ м}$,
 $DE = 4 \text{ м}$, $CN = 3 \text{ м}$, $CK = 2 \text{ м}$.

Задача S7.28.

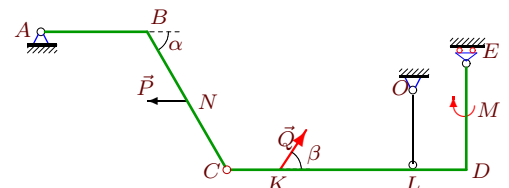
1



$P = 8 \text{ кН}$, $Q = 3 \text{ кН}$, $M = 7 \text{ кНм}$,
 $\rho = 3 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 60^\circ$,
 $AB = 6 \text{ м}$, $BC = 11 \text{ м}$, $CD = 4 \text{ м}$,
 $DE = 5 \text{ м}$, $CN = 2 \text{ м}$, $BK = 3 \text{ м}$.

Задача S7.30.

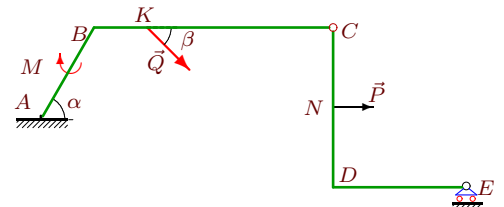
1



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

Задача S7.32.

1



$P = 6 \text{ кН}$, $Q = 1 \text{ кН}$, $M = 9 \text{ кНм}$,
 $\rho = 3 \text{ кН/м}$, $\alpha = 60^\circ$, $\beta = 30^\circ$,
 $AB = 4 \text{ м}$, $BC = 9 \text{ м}$, $CD = 6 \text{ м}$,
 $DE = 5 \text{ м}$, $CN = 3 \text{ м}$, $BK = 2 \text{ м}$.

S7 Ответы.
Составная конструкция

04.03.2012

	X_A	Y_A	X_E	Y_E	S_{OL}	M
1	17.651	12.704	-12.204	14.091	—	
2	6.188	7.626	—	-57.469	101.081	
3	9.022	13.453	-11.901	10.668	—	
4	—	8.219	2.757	59.024	—	-392.304
5	13.873	12.275	-6.409	11.725	—	
6	12.028	4.702	-13.430	17.798	—	
7	5.293	-9.971	—	-239.025	311.703	
8	-2.464	-27.771	—	-0.804	86.111	
9	—	-6.119	7.500	92.253	—	-709.271
10	11.249	2.320	-14.249	17.484	—	
11	-11.224	8.829	3.724	9.573	—	
12	—	1.964	4.268	89.036	—	-677.378
13	—	-3.804	0.804	90.804	—	-824.627
14	12.281	10.725	-15.209	16.275	—	
15	18.437	16.286	-9.437	10.910	—	
16	—	11.100	7.188	82.661	—	-839.718
17	—	10.500	-0.928	80.500	—	-805.785
18	-9.000	66.432	—	4.300	—	509.126
19	—	-9.986	6.500	96.584	—	-954.416
20	-1.343	103.814	—	-8.157	—	822.567
21	—	10.765	10.035	56.099	—	-324.964
22	—	15.147	8.224	44.955	—	-213.859
23	3.172	-3.703	—	-37.305	88.180	
24	1.757	4.939	—	-8.152	51.456	
25	-10.426	11.219	2.649	6.884	—	
26	17.050	16.550	-12.121	5.722	—	
27	-1.217	6.717	6.405	9.522	—	
28	-6.500	81.521	—	-6.119	—	714.800
29	4.812	11.350	-12.276	12.650	—	
30	6.000	6.430	—	-54.665	92.503	
31	-3.000	-68.310	—	-2.031	119.413	
32	-6.866	68.600	—	3.900	—	542.385

S7 файл о7s1B

1	$3.46 \cdot X_A - 5 \cdot Y_A + 2.38 = 0;$ $-1.73 \cdot X_A - 16 \cdot Y_A + 233.84 = 0.$
2	$11 \cdot Y_E + 7 \cdot S - 75.41 = 0;$ $16 \cdot Y_E + 12 \cdot S - 293.48 = 0.$
3	$5.2 \cdot X_E + 8 \cdot Y_E - 23.51 = 0;$ $-0 \cdot X_E + 16 \cdot Y_E - 170.7 = 0.$
4	$Y_A = 49.31/(6); M_E = -523.8 + Y_A(16)$
5	$5.2 \cdot X_A - 8 \cdot Y_A + 26.1 = 0;$ $0 \cdot X_A - 16 \cdot Y_A + 196.4 = 0.$
6	$-3.46 \cdot X_E - 2 \cdot Y_E - 10.93 = 0;$ $0 \cdot X_E + 12 \cdot Y_E - 213.57 = 0.$
7	$10 \cdot Y_E + 8 \cdot S - 103.38 = 0;$ $13 \cdot Y_E + 11 \cdot S - 321.41 = 0.$
8	$3 \cdot Y_E = 15.59 - 18;$ $6 \cdot Y_A = 4 \cdot Y_E + 3.46 - 512.9;$
9	$Y_A = 18.36/(-3); M_E = -641.96 + Y_A(11)$
10	$-3.46 \cdot X_E - 2 \cdot Y_E - 14.4 = 0;$ $1.73 \cdot X_E + 12 \cdot Y_E - 185.13 = 0.$
11	$-5.2 \cdot X_E + 6 \cdot Y_E - 38.09 = 0;$ $-1.73 \cdot X_E + 16 \cdot Y_E - 146.72 = 0.$
12	$Y_A = -5.9/(-3); M_E = -698.98 + Y_A(11)$
13	$Y_A = 11.41/(-3); M_E = -786.59 + Y_A(10)$
14	$4 \cdot X_A - 5 \cdot Y_A + 4.5 = 0;$ $-1.2 \cdot X_A - 16 \cdot Y_A + 186.28 = 0.$
15	$6.06 \cdot X_A - 8.5 \cdot Y_A + 26.66 = 0;$ $2.6 \cdot X_A - 16.5 \cdot Y_A + 220.82 = 0.$
16	$Y_A = -55.5/(-5); M_E = -967.37 + Y_A(11.5)$
17	$Y_A = -42/(-4); M_E = -931.78 + Y_A(12)$
18	$-5 \cdot Y_E = 16 - 37.5; M_A = 577.93 - 16 \cdot Y_E;$
19	$Y_A = 24.97/(-2.5); M_E = -849.56 + Y_A(10.5)$
20	$2 \cdot Y_E = 18.19 - 34.5; M_A = 732.84 - 11 \cdot Y_E;$
21	$Y_A = 86.12/(8); M_E = -497.2 + Y_A(16)$
22	$Y_A = 90.88/(6); M_E = -456.21 + Y_A(16)$
23	$12 \cdot Y_E + 7 \cdot S - 169.6 = 0;$ $14 \cdot Y_E + 9 \cdot S - 271.34 = 0.$
24	$16.5 \cdot Y_E + 11 \cdot S - 431.5 = 0;$ $11.5 \cdot Y_E + 6 \cdot S - 214.99 = 0.$
25	$-3.46 \cdot X_E + 6 \cdot Y_E - 32.12 = 0;$ $1.73 \cdot X_E + 16 \cdot Y_E - 114.73 = 0.$
26	$-6 \cdot X_A + 6 \cdot Y_A + 3 = 0;$ $-2.54 \cdot X_A - 10 \cdot Y_A + 208.74 = 0.$
27	$-4 \cdot X_A - 4 \cdot Y_A + 22 = 0;$ $1.2 \cdot X_A - 16 \cdot Y_A + 108.93 = 0.$
28	$3 \cdot Y_E = -13.86 - 4.5; M_A = 647.5 - 11 \cdot Y_E;$
29	$5.2 \cdot X_E + 6 \cdot Y_E - 12.1 = 0;$ $-0 \cdot X_E + 16 \cdot Y_E - 202.4 = 0.$
30	$16 \cdot Y_E + 14 \cdot S - 420.4 = 0;$ $9 \cdot Y_E + 7 \cdot S - 155.54 = 0.$
31	$4 \cdot Y_E = -12.12 + 4; 4 \cdot Y_A = 6 \cdot Y_E - 4 - 469.34;$
32	$-5 \cdot Y_E = 18 - 37.5; M_A = 604.78 - 16 \cdot Y_E;$