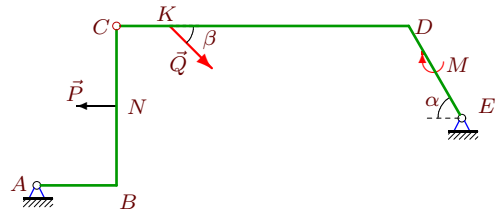
Составная конструкция

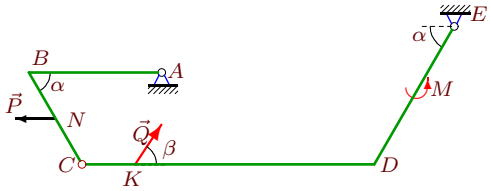
Определить реакции опор конструкции (в кН), состоящей из двух тел. Конструкция расположена в вертикальной плоскости. Дан погонный вес ρ.

Задача S7.1. 8



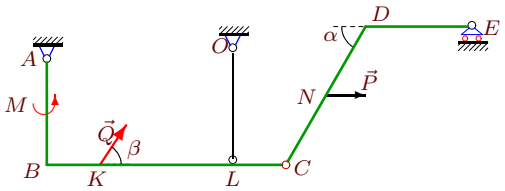
$P = 5$ кН, $Q = 8$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 3$ м, $BC = 6$ м, $CD = 11$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.2. 8



$P = 7$ кН, $Q = 3$ кН, $M = 9$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 5$ м, $BC = 4$ м, $CD = 11$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.3. 8



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

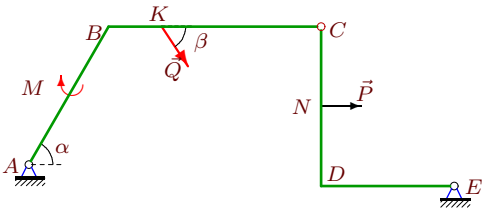
Задача S7.4. 8

$P = 6$ кН, $Q = 6$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 5$ м, $BC = 4$ м, $CD = 12$ м,
$DE = 4$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.5. 8

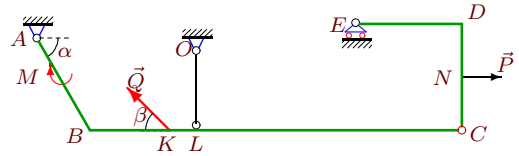
$P = 8$ кН, $Q = 7$ кН, $M = 9$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 14$ м, $CD = 4$ м,
$DE = 5$ м, $CN = 2$ м, $BK = 3$ м. $LC = 10$ м.

Задача S7.6. 8



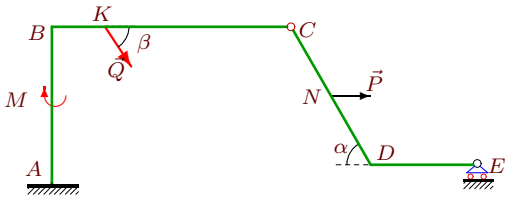
$P = 7$ кН, $Q = 1$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 8$ м, $CD = 6$ м,
$DE = 5$ м, $CN = 3$ м, $BK = 2$ м.

Задача S7.7. 8



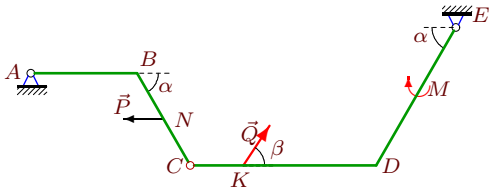
$P = 6$ кН, $Q = 1$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 14$ м, $CD = 4$ м,
$DE = 4$ м, $CN = 2$ м, $BK = 3$ м. $LC = 10$ м.

Задача S7.8. 8



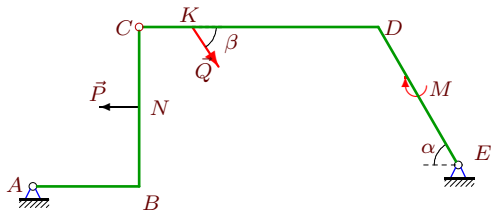
$P = 9$ кН, $Q = 8$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 9$ м, $CD = 6$ м,
$DE = 4$ м, $CN = 3$ м, $BK = 2$ м.

Задача S7.9.



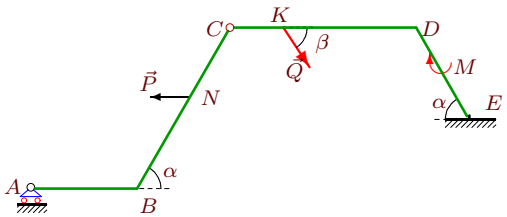
$P = 6$ кН, $Q = 6$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 4$ м, $BC = 4$ м, $CD = 7$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.10.



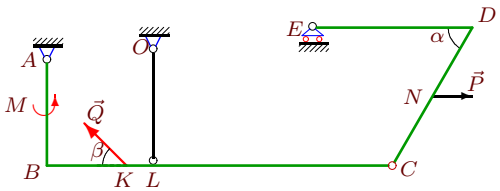
$P = 7$ кН, $Q = 6$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 6$ м, $CD = 9$ м,
$DE = 6$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.11.



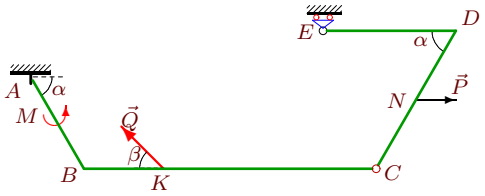
$P = 9$ кН, $Q = 3$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 7$ м, $CD = 7$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.12.



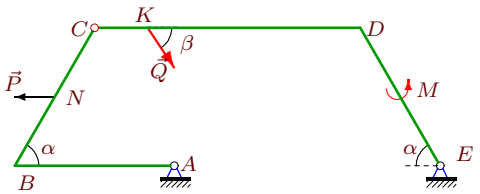
$P = 5$ кН, $Q = 7$ кН, $M = 3$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 4$ м, $BC = 13$ м, $CD = 6$ м,
$DE = 6$ м, $CN = 3$ м, $BK = 3$ м. $LC = 9$ м.

Задача S7.13.



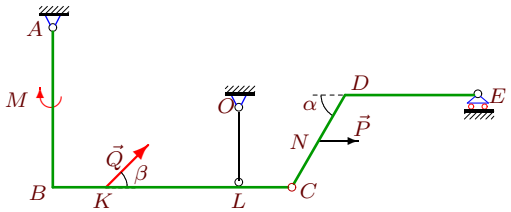
$P = 7$ кН, $Q = 3$ кН, $M = 5$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 11$ м, $CD = 6$ м,
$DE = 5$ м, $CN = 3$ м, $BK = 3$ м.

Задача S7.14.



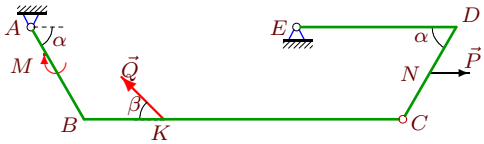
$P = 7$ кН, $Q = 3$ кН, $M = 9$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 6$ м, $CD = 10$ м,
$DE = 6$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.15.



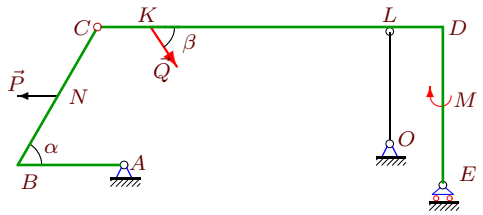
$P = 6$ кН, $Q = 8$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 6$ м, $BC = 9$ м, $CD = 4$ м,
$DE = 5$ м, $CN = 2$ м, $BK = 2$ м. $LC = 2$ м.

Задача S7.16.



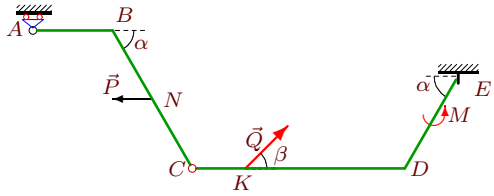
$P = 5$ кН, $Q = 3$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 12$ м, $CD = 4$ м,
$DE = 6$ м, $CN = 2$ м, $BK = 3$ м.

Задача S7.17.



$P = 7$ кН, $Q = 2$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 4$ м, $BC = 6$ м, $CD = 13$ м,
$DE = 6$ м, $CN = 3$ м, $CK = 2$ м. $LD = 2$ м

Задача S7.18.

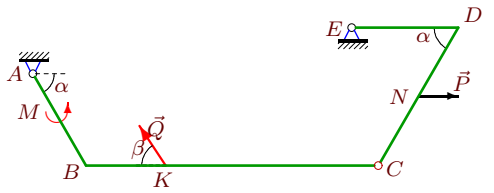


$P = 7$ кН, $Q = 6$ кН, $M = 5$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 3$ м, $BC = 6$ м, $CD = 8$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.19.

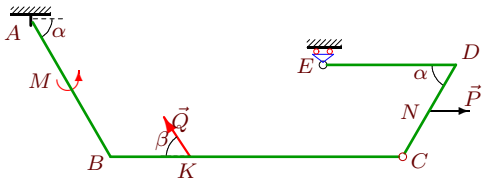
$P = 5$ кН, $Q = 3$ кН, $M = 5$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 12$ м, $CD = 4$ м,
$DE = 5$ м, $CN = 2$ м, $BK = 3$ м.

Задача S7.20.



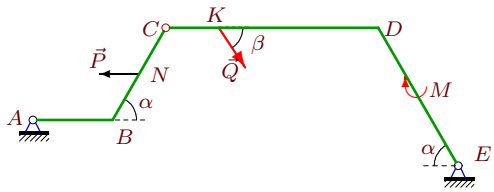
$P = 6$ кН, $Q = 4$ кН, $M = 7$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 4$ м, $BC = 11$ м, $CD = 6$ м,
$DE = 4$ м, $CN = 3$ м, $BK = 3$ м.

Задача S7.21.



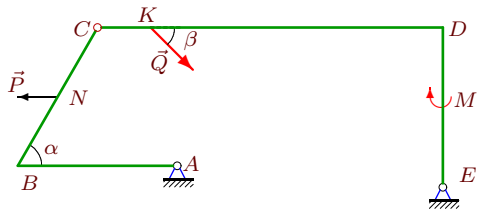
$P = 9$ кН, $Q = 4$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 11$ м, $CD = 4$ м,
$DE = 5$ м, $CN = 2$ м, $BK = 3$ м.

Задача S7.22.



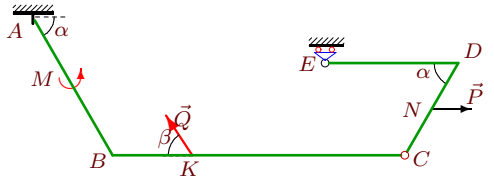
$P = 6$ кН, $Q = 4$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 3$ м, $BC = 4$ м, $CD = 8$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.23.



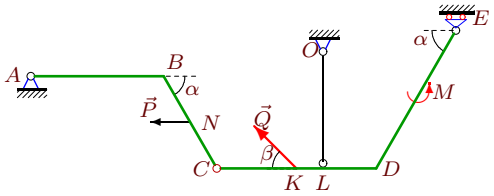
$P = 4$ кН, $Q = 1$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 6$ м, $BC = 6$ м, $CD = 13$ м,
$DE = 6$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.24.



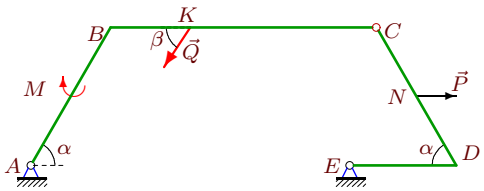
$P = 9$ кН, $Q = 4$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 11$ м, $CD = 4$ м,
$DE = 5$ м, $CN = 2$ м, $BK = 3$ м.

Задача S7.25.



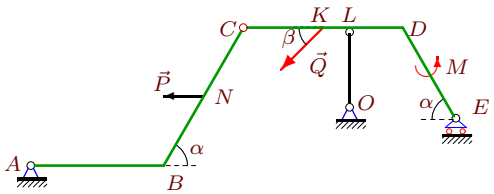
$P = 6$ кН, $Q = 6$ кН, $M = 5$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 5$ м, $BC = 4$ м, $CD = 6$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 3$ м. $LD = 2$ м

Задача S7.26.



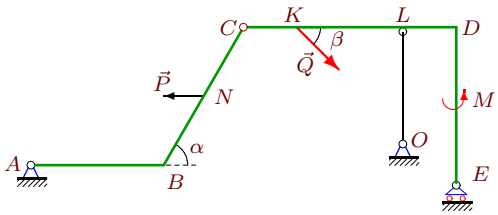
$P = 7$ кН, $Q = 4$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 10$ м, $CD = 6$ м,
$DE = 4$ м, $CN = 3$ м, $BK = 3$ м.

Задача S7.27.



$P = 5$ кН, $Q = 3$ кН, $M = 3$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 5$ м, $BC = 6$ м, $CD = 6$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 3$ м. $LD = 2$ м

Задача S7.28.

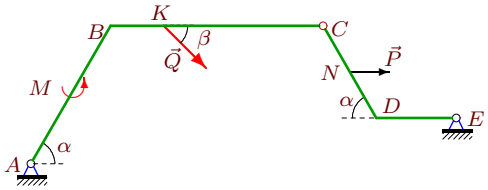


$P = 6$ кН, $Q = 2$ кН, $M = 5$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 5$ м, $BC = 6$ м, $CD = 8$ м,
$DE = 6$ м, $CN = 3$ м, $CK = 2$ м. $LD = 2$ м

Задача S7.29.

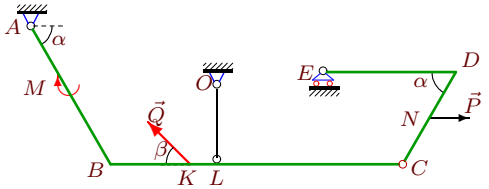
$P = 6$ кН, $Q = 6$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 4$ м, $BC = 9$ м, $CD = 4$ м,
$DE = 3$ м, $CN = 2$ м, $BK = 2$ м.

Задача S7.30.



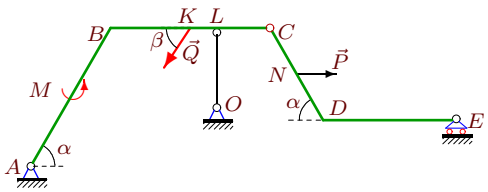
$P = 4$ кН, $Q = 6$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 6$ м, $BC = 8$ м, $CD = 4$ м,
$DE = 3$ м, $CN = 2$ м, $BK = 2$ м.

Задача S7.31.



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

Задача S7.32.



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

S7 Ответы.
Составная конструкция 04.03.2012

	X_A	Y_A	X_E	Y_E	S_{OL}	M
1	10.384	17.268	-11.041	12.389	–	
2	21.329	20.087	-15.105	3.015	–	
3	-9.812	13.993	–	11.255	13.991	
4	–	-4.964	0.804	76.964	–	-699.713
5	-6.188	-65.299	–	-5.619	118.156	
6	6.344	11.342	-13.603	14.624	–	
7	-5.293	-30.395	–	1.000	80.688	
8	-11.071	73.639	–	9.088	–	400.584
9	-2.159	6.312	5.159	9.492	–	
10	13.742	17.363	-8.295	13.433	–	
11	–	10.582	8.224	58.315	–	-369.031
12	1.062	-86.680	–	-10.330	151.510	
13	-4.879	102.222	–	-26.343	–	998.456
14	-16.074	30.903	22.297	-0.005	–	
15	-11.657	20.967	–	9.056	12.320	
16	25.496	0.971	-28.375	22.908	–	
17	6.000	-38.990	–	-375.741	474.464	
18	–	14.281	2.757	44.476	–	-244.696
19	16.633	3.735	-19.512	19.144	–	
20	4.582	5.532	-8.582	16.004	–	
21	-7.965	80.832	–	-6.696	–	705.678
22	14.194	10.655	-10.194	13.809	–	
23	-15.486	27.286	18.620	4.214	–	
24	-7.965	80.832	–	-6.696	–	705.678
25	10.243	3.987	–	-5.362	39.132	
26	-9.313	7.281	3.348	22.582	–	
27	7.598	12.436	–	-7.689	38.752	
28	4.586	10.155	–	-44.863	86.123	
29	-11.196	46.222	–	10.778	–	258.152
30	5.247	12.479	-14.444	11.521	–	
31	-3.172	-16.657	–	-4.464	70.292	
32	-4.000	6.441	–	5.839	34.915	

S7 файл o7s8B

1	$6 \cdot X_A - 3 \cdot Y_A - 10.5 = 0;\quad 2.54 \cdot X_A - 16 \cdot Y_A + 249.95 = 0.$
2	$-3.46 \cdot X_A + 3 \cdot Y_A + 13.62 = 0;\quad 1.73 \cdot X_A - 11 \cdot Y_A + 184.01 = 0.$
3	$-7 \cdot Y_E = -20.78 - 58;\ 7 \cdot Y_A = 9 \cdot Y_E - 4 - 317.26;$
4	$Y_A = 14.9/(-3);\ M_E = -645.1 + Y_A(11)$
5	$3 \cdot Y_E = -13.86 - 3;\ 4 \cdot Y_A = 7 \cdot Y_E - 4 - 435.57;$
6	$6 \cdot X_E + 5 \cdot Y_E + 8.5 = 0;\quad 0.8 \cdot X_E + 16 \cdot Y_E - 223.05 = 0.$
7	$4 \cdot Y_E = -12 + 16;\ 6 \cdot Y_A = 6 \cdot Y_E - 3.46 - 514.46;$
8	$-7 \cdot Y_E = 23.38 - 87;\ M_A = 546 - 16 \cdot Y_E;$
9	$-3.46 \cdot X_A - 6 \cdot Y_A + 30.4 = 0;\quad 1.73 \cdot X_A - 16 \cdot Y_A + 104.73 = 0.$
10	$6 \cdot X_A - 4 \cdot Y_A - 13 = 0;\quad 0.8 \cdot X_A - 16 \cdot Y_A + 266.76 = 0.$
11	$Y_A = 79.37/(7.5);\ M_E = -543.64 + Y_A(16.5)$
12	$3 \cdot Y_E = -13 - 18;\ 4 \cdot Y_A = 6 \cdot Y_E - 4 - 498.49;$
13	$2 \cdot Y_E = -18.19 - 34.5;\ M_A = 708.68 - 11 \cdot Y_E;$
14	$5.2 \cdot X_A + 3 \cdot Y_A - 9.19 = 0;\quad 0 \cdot X_A - 10 \cdot Y_A + 309.03 = 0.$
15	$-7 \cdot Y_E = -10.4 - 53;\ 7 \cdot Y_A = 9 \cdot Y_E - 6 - 301.08;$
16	$-3.46 \cdot X_E - 4 \cdot Y_E - 6.66 = 0;\quad 0 \cdot X_E + 10 \cdot Y_E - 229.08 = 0.$
17	$12 \cdot Y_E + 10 \cdot S - 235.74 = 0;\quad 13 \cdot Y_E + 11 \cdot S - 334.46 = 0.$
18	$Y_A = 85.69/(6);\ M_E = -473.2 + Y_A(16)$
19	$-3.46 \cdot X_E - 3 \cdot Y_E - 10.16 = 0;\quad 0 \cdot X_E + 11 \cdot Y_E - 210.58 = 0.$
20	$-5.2 \cdot X_E - 1 \cdot Y_E - 28.59 = 0;\quad -1.73 \cdot X_E + 12 \cdot Y_E - 206.91 = 0.$
21	$3 \cdot Y_E = -15.59 - 4.5;\ M_A = 632.02 - 11 \cdot Y_E;$
22	$3.46 \cdot X_A - 5 \cdot Y_A + 4.1 = 0;\quad -1.73 \cdot X_A - 16 \cdot Y_A + 195.07 = 0.$
23	$5.2 \cdot X_A + 3 \cdot Y_A - 1.4 = 0;\quad -0.8 \cdot X_A - 10 \cdot Y_A + 260.41 = 0.$
24	$3 \cdot Y_E = -15.59 - 4.5;\ M_A = 632.02 - 11 \cdot Y_E;$
25	$16 \cdot Y_E + 11 \cdot S - 344.66 = 0;\quad 9 \cdot Y_E + 4 \cdot S - 108.27 = 0.$
26	$5.2 \cdot X_E - 1 \cdot Y_E + 5.19 = 0;\quad -0 \cdot X_E + 12 \cdot Y_E - 270.99 = 0.$
27	$16 \cdot Y_E + 12 \cdot S - 342 = 0;\quad 8 \cdot Y_E + 4 \cdot S - 93.5 = 0.$
28	$16 \cdot Y_E + 14 \cdot S - 487.9 = 0;\quad 8 \cdot Y_E + 6 \cdot S - 157.83 = 0.$
29	$-5 \cdot Y_E = -10.4 - 43.5;\ M_A = 430.6 - 16 \cdot Y_E;$
30	$3.46 \cdot X_E + 5 \cdot Y_E - 7.57 = 0;\quad -1.73 \cdot X_E + 16 \cdot Y_E - 209.36 = 0.$
31	$3 \cdot Y_E = -10.4 - 3;\ 7 \cdot Y_A = 4 \cdot Y_E - 5.2 - 459.42;$
32	$-7 \cdot Y_E = 12.12 - 53;\ 7 \cdot Y_A = 9 \cdot Y_E + 5.2 - 337.84;$