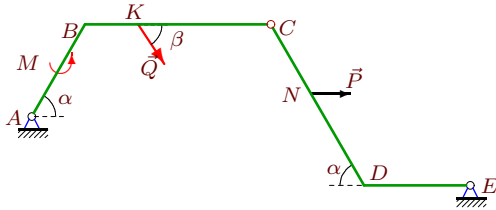# Составная конструкция

Определить реакции опор конструкции (в кН), состоящей из двух тел. Конструкция расположена в вертикальной плоскости. Дан погонный вес ρ.
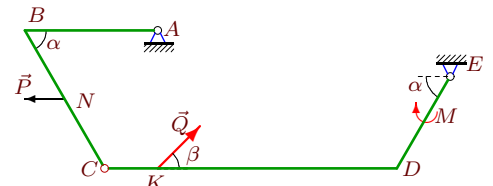
Задача S7.1.

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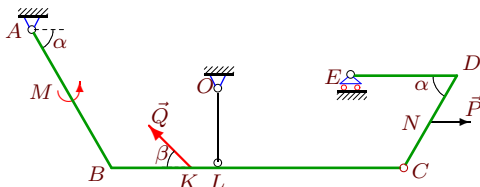$DE = 4$ м, $CN = 3$ м, $BK = 2$ м.

Задача S7.2.

$P = 4$ кН, $Q = 6$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 5$ м, $BC = 6$ м, $CD = 11$ м,
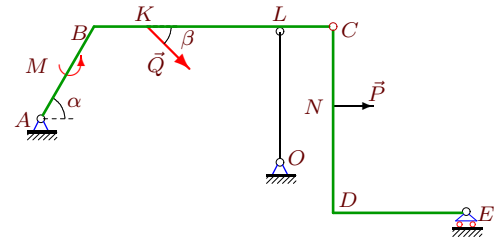$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.3.

$P = 5$ кН, $Q = 6$ кН, $M = 3$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 6$ м, $BC = 11$ м, $CD = 4$ м,
$DE = 4$ м, $CN = 2$ м, $BK = 3$ м. $LC = 7$ м.

Задача S7.4.

$P = 6$ кН, $Q = 1$ кН, $M = 5$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 9$ м, $CD = 7$ м,
$DE = 5$ м, $CN = 3$ м, $BK = 2$ м. $LC = 2$ м.

Задача S7.5.

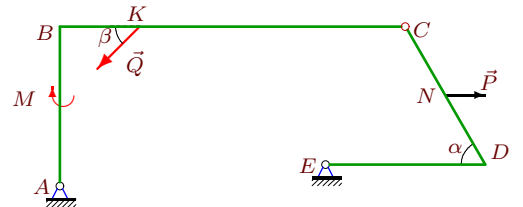$P = 5$ кН, $Q = 3$ кН, $M = 5$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 12$ м, $CD = 4$ м,
$DE = 4$ м, $CN = 2$ м, $BK = 3$ м.

Задача S7.6.

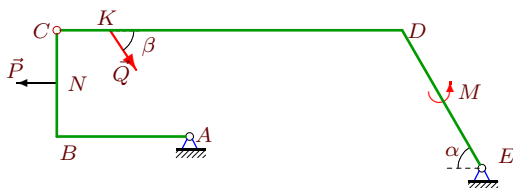$P = 4$ кН, $Q = 6$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 6$ м, $BC = 13$ м, $CD = 6$ м,
$DE = 6$ м, $CN = 3$ м, $BK = 3$ м.

Задача S7.7.
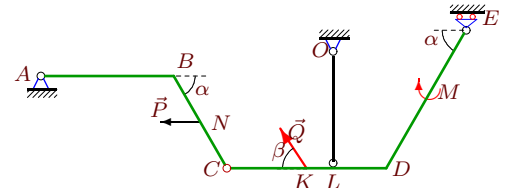

$P = 6$ кН, $Q = 9$ кН, $M = 7$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 5$ м, $BC = 4$ м, $CD = 13$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.8.

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

Задача S7.9.

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

Задача S7.10.

$P = 9$ кН, $Q = 8$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 10$ м, $CD = 6$ м,
$DE = 3$ м, $CN = 3$ м, $BK = 2$ м.

Задача S7.11.
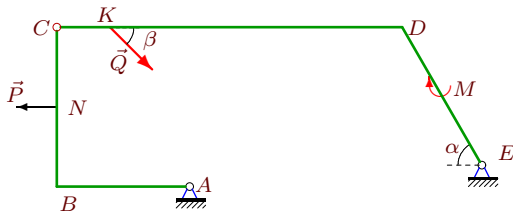
$P = 4$ кН, $Q = 8$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 5$ м, $BC = 6$ м, $CD = 13$ м,
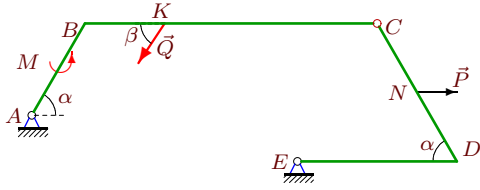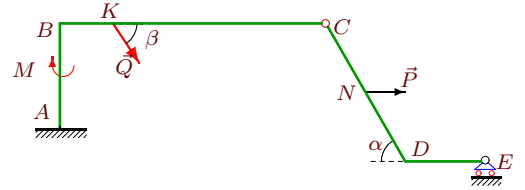$DE = 6$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.12.
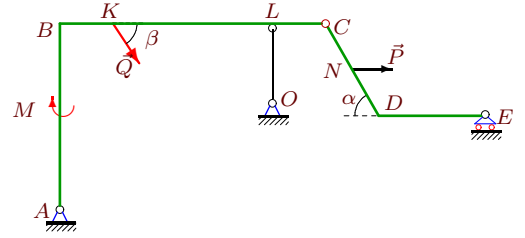
$P = 7$ кН, $Q = 8$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 7$ м, $BC = 10$ м, $CD = 4$ м,
$DE = 4$ м, $CN = 2$ м, $BK = 2$ м. $LC = 2$ м.

Задача S7.13.

$P = 7$ кН, $Q = 2$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 4$ м, $CD = 14$ м,
$DE = 4$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.14.

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

Задача S7.15.
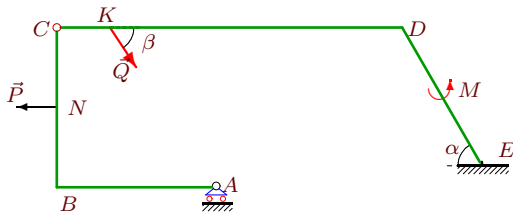
$P = 9$ кН, $Q = 8$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 6$ м, $CD = 13$ м,
$DE = 6$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.16.
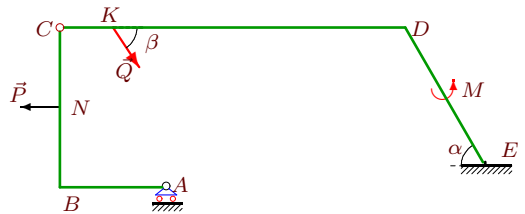
$P = 9$ кН, $Q = 7$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 6$ м, $CD = 13$ м,
$DE = 6$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.17.
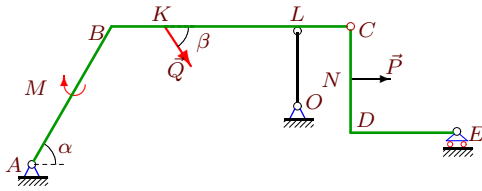
$P = 8$ кН, $Q = 1$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 9$ м, $CD = 4$ м,
$DE = 4$ м, $CN = 2$ м, $BK = 2$ м. $LC = 2$ м.

Задача S7.18.

$P = 8$ кН, $Q = 2$ кН, $M = 9$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 9$ м, $CD = 4$ м,
$DE = 4$ м, $CN = 2$ м, $BK = 2$ м. $LC = 2$ м.
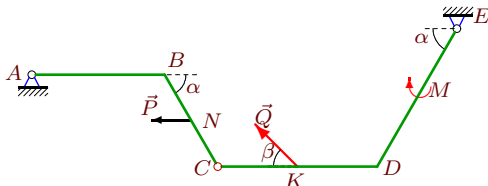
Задача S7.19.

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

Задача S7.20.

$P = 4$ кН, $Q = 5$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 6$ м, $BC = 5$ м, $CD = 6$ м,
$DE = 5$ м, $CN = 3$ м, $BK = 3$ м.
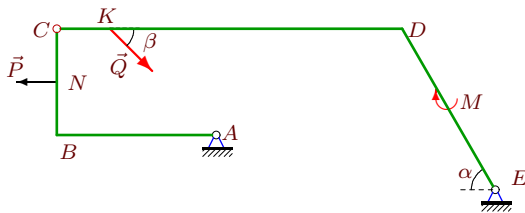
Задача S7.21.

$P = 5$ кН, $Q = 8$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 6$ м, $BC = 4$ м, $CD = 13$ м,
$DE = 7$ м, $CN = 2$ м, $CK = 2$ м.
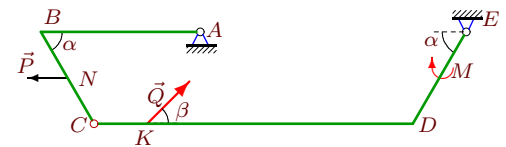
Задача S7.22.

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

Задача S7.23.

$P = 5$ кН, $Q = 7$ кН, $M = 3$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 6$ м, $BC = 10$ м, $CD = 4$ м,
$DE = 4$ м, $CN = 2$ м, $BK = 2$ м. $LC = 2$ м.
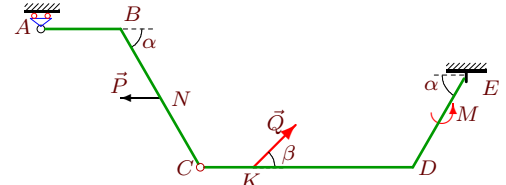
Задача S7.24.

$P = 6$ кН, $Q = 3$ кН, $M = 3$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 3$ м, $BC = 6$ м, $CD = 8$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.
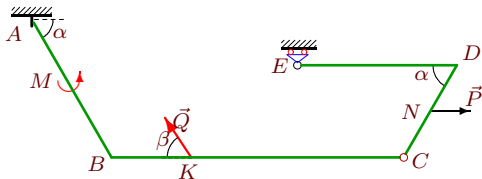
$P = 8$ кН, $Q = 6$ кН, $M = 7$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 6$ м, $BC = 11$ м, $CD = 4$ м,
$DE = 6$ м, $CN = 2$ м, $BK = 3$ м.

$P = 5$ кН, $Q = 7$ кН, $M = 5$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 6$ м, $BC = 6$ м, $CD = 14$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.
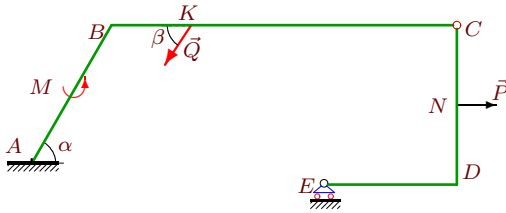
$P = 8$ кН, $Q = 2$ кН, $M = 7$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 6$ м, $BC = 13$ м, $CD = 6$ м,
$DE = 5$ м, $CN = 3$ м, $BK = 3$ м.
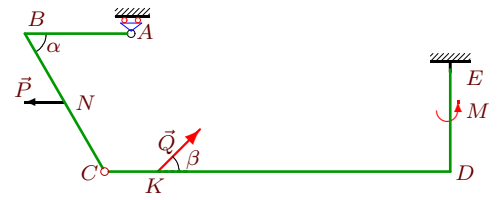
$P = 7$ кН, $Q = 1$ кН, $M = 5$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 6$ м, $CD = 13$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

$P = 7$ кН, $Q = 3$ кН, $M = 5$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 6$ м, $CD = 11$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.
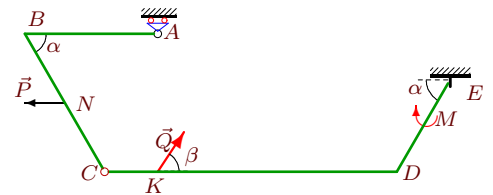
$P = 8$ кН, $Q = 6$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 5$ м, $BC = 6$ м, $CD = 11$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

$P = 5$ кН, $Q = 5$ кН, $M = 3$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 7$ м, $BC = 7$ м, $CD = 4$ м,
$DE = 4$ м, $CN = 2$ м, $BK = 2$ м. $LC = 2$ м.
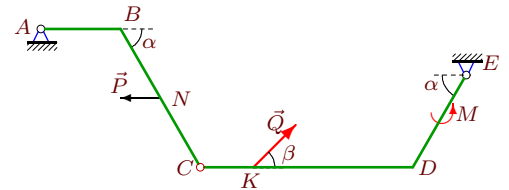
$P = 4$ кН, $Q = 3$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 3$ м, $BC = 6$ м, $CD = 8$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

	X_A	Y_A	X_E	Y_E	S_{OL}	M
1	6.355	11.334	-14.131	13.564	—	
2	11.215	18.192	-12.411	4.808	—	
3	0.196	-19.761	—	-8.330	75.092	
4	-6.707	5.456	—	1.400	43.851	
5	10.354	5.289	-13.233	16.590	—	
6	-13.292	8.442	14.488	25.558	—	
7	-42.349	38.779	43.849	-2.985	—	
8	10.000	4.355	—	-2.677	35.126	
9	-18.125	7.775	12.677	25.020	—	
10	-11.071	69.375	—	7.353	—	415.208
11	-19.129	27.855	16.201	6.145	—	
12	-11.000	13.483	—	4.646	38.800	
13	13.372	15.098	-6.889	8.970	—	
14	-11.704	9.432	2.204	6.505	—	
15	—	13.500	6.929	87.227	—	-910.690
16	—	12.750	7.188	81.011	—	-814.512
17	-8.259	7.092	—	0.000	39.874	
18	-8.518	17.460	—	8.000	18.608	
19	-0.447	5.244	9.689	11.513	—	
20	11.365	14.069	-11.035	10.431	—	
21	-61.827	45.885	61.170	-10.228	—	
22	25.270	20.220	-23.099	2.952	—	
23	-11.062	23.574	—	8.110	12.816	
24	—	13.848	3.402	47.652	—	-266.735
25	-5.000	77.768	—	-1.964	—	690.840
26	-24.607	30.107	24.657	4.843	—	
27	-7.000	79.432	—	12.300	—	768.465
28	—	-57.187	6.293	137.479	—	-1358.975
29	—	-57.187	4.879	130.065	—	-1357.690
30	—	-27.642	5.000	100.446	—	-964.372
31	-9.330	5.634	—	5.223	35.643	
32	-6.048	10.719	7.450	8.781	—	

S7 файл   o7s6B

1	$6.06 \cdot X_E + 7.5 \cdot Y_E - 16.06 = 0;\quad 2.6 \cdot X_E + 16.5 \cdot Y_E - 187.1 = 0.$
2	$-5.2 \cdot X_A + 2 \cdot Y_A + 21.9 = 0;\quad -1.73 \cdot X_A - 11 \cdot Y_A + 219.54 = 0.$
3	$2 \cdot Y_E = -8.66 - 8;\; 7 \cdot Y_A = 5 \cdot Y_E - 5.2 - 424.66;$
4	$-5 \cdot Y_E = 18 - 25;\; 9 \cdot Y_A = 7 \cdot Y_E + 3.46 - 440.78;$
5	$-3.46 \cdot X_E - 2 \cdot Y_E - 12.66 = 0;\quad 0 \cdot X_E + 12 \cdot Y_E - 199.08 = 0.$
6	$5.2 \cdot X_E - 3 \cdot Y_E + 1.4 = 0;\quad -0.8 \cdot X_E + 10 \cdot Y_E - 243.93 = 0.$
7	$4 \cdot X_A + 5 \cdot Y_A - 24.5 = 0;\quad -1.2 \cdot X_A - 11 \cdot Y_A + 375.91 = 0.$
8	$16 \cdot Y_E + 11 \cdot S - 343.56 = 0;\quad 9 \cdot Y_E + 4 \cdot S - 116.41 = 0.$
9	$5.2 \cdot X_E - 3 \cdot Y_E + 9.19 = 0;\quad 1.73 \cdot X_E + 10 \cdot Y_E - 272.16 = 0.$
10	$-6 \cdot Y_E = 23.38 - 67.5;\; M_A = 532.85 - 16 \cdot Y_E;$
11	$6 \cdot X_A + 5 \cdot Y_A - 24.5 = 0;\quad 0.8 \cdot X_A - 11 \cdot Y_A + 321.78 = 0.$
12	$-6 \cdot Y_E = 12.12 - 40;\; 8 \cdot Y_A = 8 \cdot Y_E + 7 - 384.73;$
13	$-3.46 \cdot X_A + 2 \cdot Y_A + 16.12 = 0;\quad 0.54 \cdot X_A - 12 \cdot Y_A + 174.01 = 0.$
14	$-3.46 \cdot X_E + 5 \cdot Y_E - 24.9 = 0;\quad 0.54 \cdot X_E + 16 \cdot Y_E - 105.27 = 0.$
15	$Y_A = -81/(-6);\; M_E = -1045.69 + Y_A(10)$
16	$Y_A = -51/(-4);\; M_E = -967.51 + Y_A(12)$
17	$-4 \cdot Y_E = 16 - 16;\; 10 \cdot Y_A = 6 \cdot Y_E + 5.2 - 398.74;$
18	$-4 \cdot Y_E = -16 - 16;\; 10 \cdot Y_A = 6 \cdot Y_E - 5.2 - 358.34;$
19	$-3.46 \cdot X_A - 7 \cdot Y_A + 35.16 = 0;\quad 1.73 \cdot X_A - 16 \cdot Y_A + 84.68 = 0.$
20	$5.2 \cdot X_E + 8 \cdot Y_E - 26.1 = 0;\quad -0 \cdot X_E + 16 \cdot Y_E - 166.9 = 0.$
21	$4 \cdot X_A + 6 \cdot Y_A - 28 = 0;\quad -2.06 \cdot X_A - 10.5 \cdot Y_A + 354.3 = 0.$
22	$-3.46 \cdot X_A + 4 \cdot Y_A + 6.66 = 0;\quad 0 \cdot X_A - 10 \cdot Y_A + 202.2 = 0.$
23	$-6 \cdot Y_E = -8.66 - 40;\; 8 \cdot Y_A = 8 \cdot Y_E - 6 - 298.66;$
24	$Y_A = 83.09/(6);\; M_E = -488.3 + Y_A(16)$
25	$4 \cdot Y_E = -13.86 + 6;\; M_A = 671.2 - 10 \cdot Y_E;$
26	$6 \cdot X_A + 6 \cdot Y_A - 33 = 0;\quad 2.54 \cdot X_A - 10 \cdot Y_A + 363.47 = 0.$
27	$5 \cdot Y_E = 24 + 37.5;\; M_A = 903.77 - 11 \cdot Y_E;$
28	$Y_A = 57.19/(-1);\; M_E = -672.74 + Y_A(12)$
29	$Y_A = 57.19/(-1);\; M_E = -671.45 + Y_A(12)$
30	$Y_A = 55.28/(-2);\; M_E = -660.3 + Y_A(11)$
31	$-6 \cdot Y_E = 8.66 - 40;\; 8.5 \cdot Y_A = 8 \cdot Y_E + 6.06 - 389.15;$
32	$-5.2 \cdot X_A - 6 \cdot Y_A + 32.9 = 0;\quad -1.73 \cdot X_A - 16 \cdot Y_A + 161.04 = 0.$