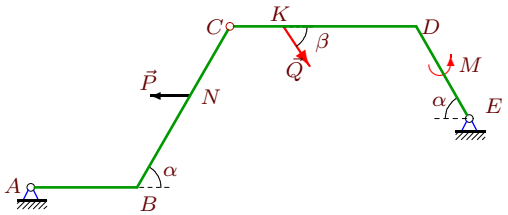
Составная конструкция

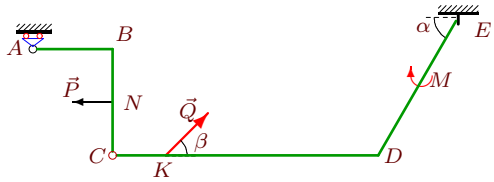
Определить реакции опор конструкции (в кН), состоящей из двух тел. Конструкция расположена в вертикальной плоскости. Дан погонный вес ρ.

Задача S7.1. 2



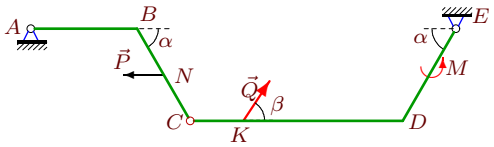
$P = 7$ кН, $Q = 3$ кН, $M = 9$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 7$ м, $CD = 7$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.2. 2



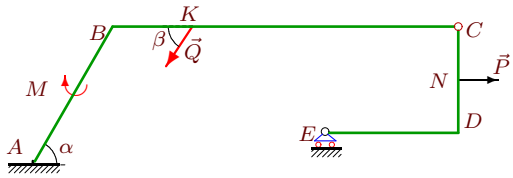
$P = 6$ кН, $Q = 7$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 3$ м, $BC = 4$ м, $CD = 10$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.3. 2



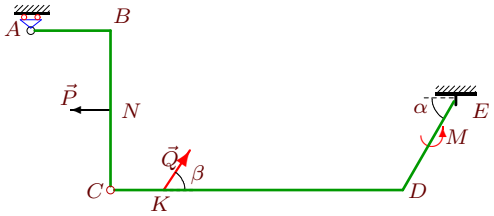
$P = 6$ кН, $Q = 5$ кН, $M = 7$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 4$ м, $BC = 4$ м, $CD = 8$ м,
$DE = 4$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.4. 2



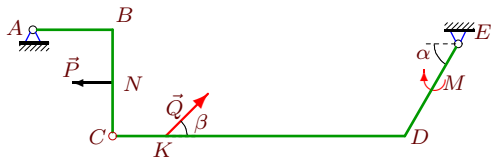
$P = 9$ кН, $Q = 2$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 13$ м, $CD = 4$ м,
$DE = 5$ м, $CN = 2$ м, $BK = 3$ м.

Задача S7.5. 2



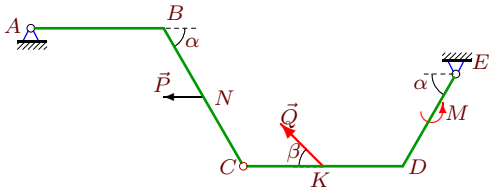
$P = 9$ кН, $Q = 9$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 3$ м, $BC = 6$ м, $CD = 11$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.6. 2



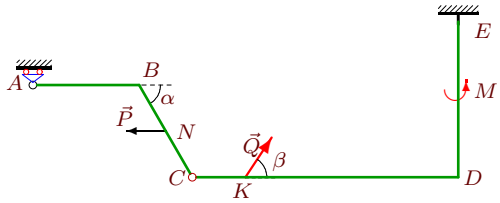
$P = 5$ кН, $Q = 8$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 3$ м, $BC = 4$ м, $CD = 11$ м,
$DE = 4$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.7. 2



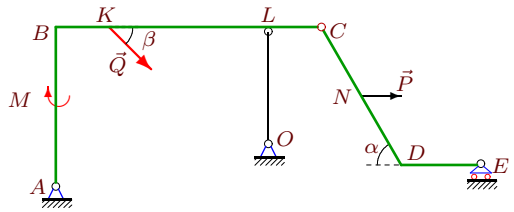
$P = 5$ кН, $Q = 6$ кН, $M = 5$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 5$ м, $BC = 6$ м, $CD = 6$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 3$ м.

Задача S7.8. 2



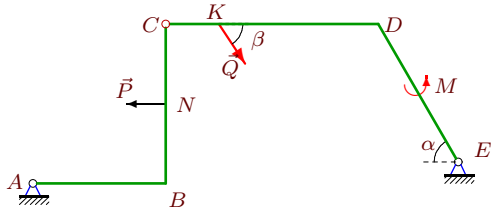
$P = 9$ кН, $Q = 2$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 4$ м, $CD = 10$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.9.



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

Задача S7.10.

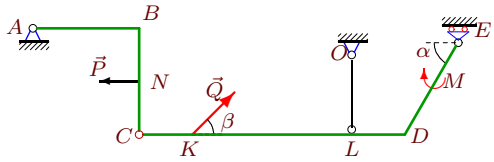


$P = 6$ кН, $Q = 7$ кН, $M = 7$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 5$ м, $BC = 6$ м, $CD = 8$ м,
$DE = 6$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.11.

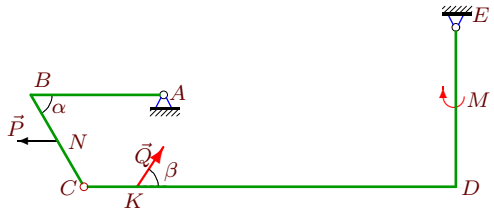
$P = 9$ кН, $Q = 7$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 4$ м, $CD = 14$ м,
$DE = 4$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.12.



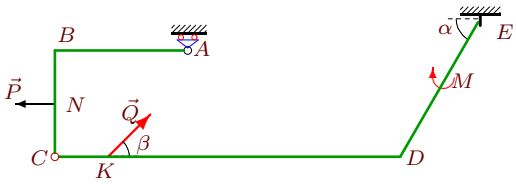
$P = 5$ кН, $Q = 7$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 4$ м, $BC = 4$ м, $CD = 10$ м,
$DE = 4$ м, $CN = 2$ м, $CK = 2$ м. $LD = 2$ м

Задача S7.13.



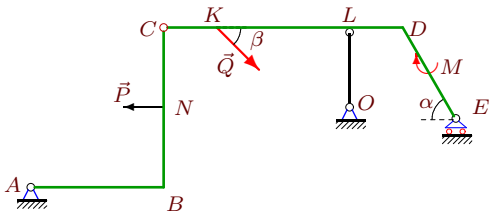
$P = 6$ кН, $Q = 2$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 5$ м, $BC = 4$ м, $CD = 14$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.14.



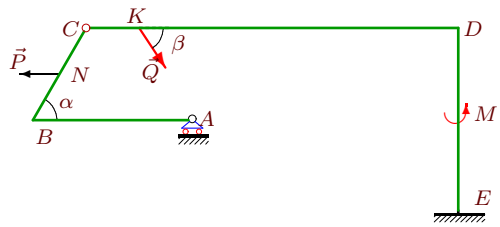
$P = 6$ кН, $Q = 7$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 5$ м, $BC = 4$ м, $CD = 13$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.15.



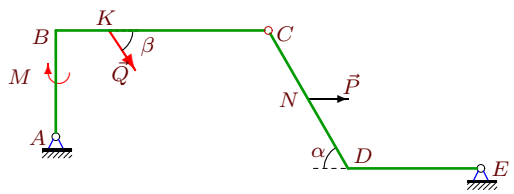
$P = 6$ кН, $Q = 7$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 5$ м, $BC = 6$ м, $CD = 9$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м. $LD = 2$ м

Задача S7.16.



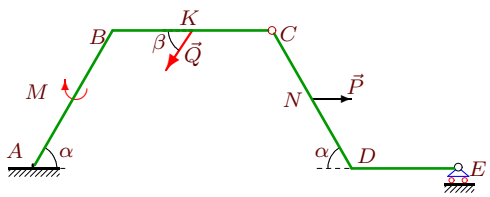
$P = 8$ кН, $Q = 1$ кН, $M = 7$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 6$ м, $BC = 4$ м, $CD = 14$ м,
$DE = 7$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.17.



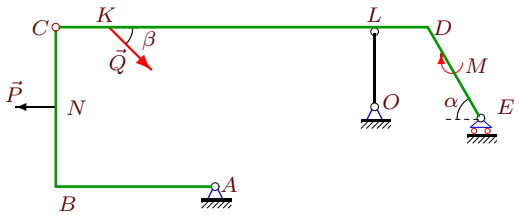
$P = 7$ кН, $Q = 6$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 8$ м, $CD = 6$ м,
$DE = 5$ м, $CN = 3$ м, $BK = 2$ м.

Задача S7.18.



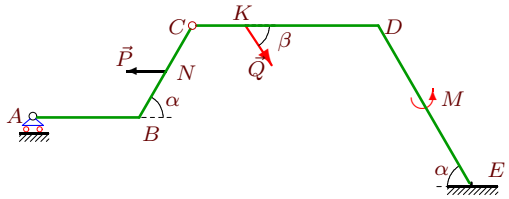
$P = 8$ кН, $Q = 4$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 6$ м, $BC = 6$ м, $CD = 6$ м,
$DE = 4$ м, $CN = 3$ м, $BK = 3$ м.

Задача S7.19.



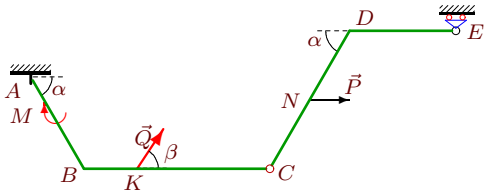
$P = 5$ кН, $Q = 7$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 6$ м, $BC = 6$ м, $CD = 14$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м. $LD = 2$ м

Задача S7.20.



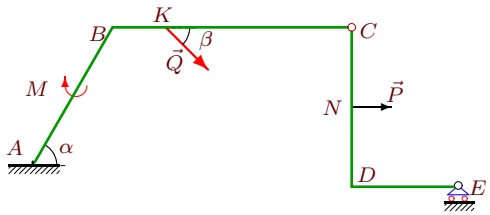
$P = 8$ кН, $Q = 5$ кН, $M = 7$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 4$ м, $BC = 4$ м, $CD = 7$ м,
$DE = 7$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.21.



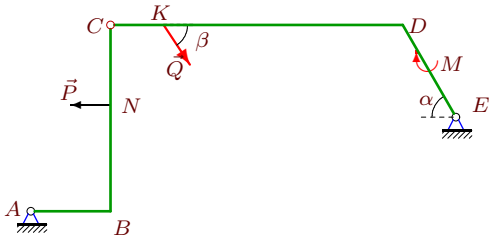
$P = 9$ кН, $Q = 3$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 7$ м, $CD = 6$ м,
$DE = 4$ м, $CN = 3$ м, $BK = 2$ м.

Задача S7.22.



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

Задача S7.23.

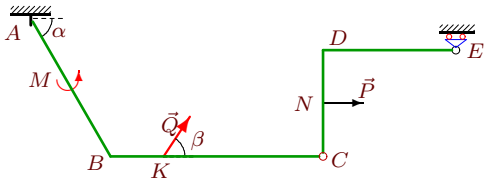


$P = 6$ кН, $Q = 8$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 3$ м, $BC = 7$ м, $CD = 11$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.24.

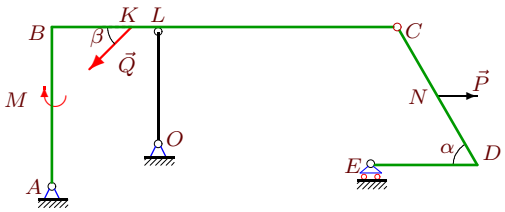
$P = 6$ кН, $Q = 8$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 6$ м, $BC = 14$ м, $CD = 4$ м,
$DE = 4$ м, $CN = 2$ м, $BK = 3$ м.

Задача S7.25.



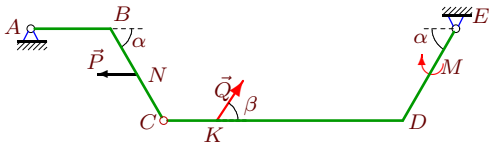
$P = 8$ кН, $Q = 1$ кН, $M = 7$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 6$ м, $BC = 8$ м, $CD = 4$ м,
$DE = 5$ м, $CN = 2$ м, $BK = 2$ м.

Задача S7.26.



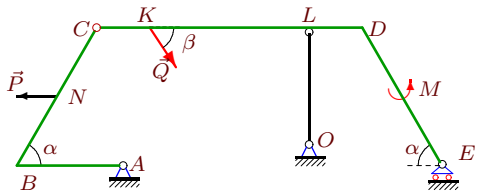
$P = 5$ кН, $Q = 8$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 6$ м, $BC = 13$ м, $CD = 6$ м,
$DE = 4$ м, $CN = 3$ м, $BK = 3$ м. $LC = 9$ м.

Задача S7.27.



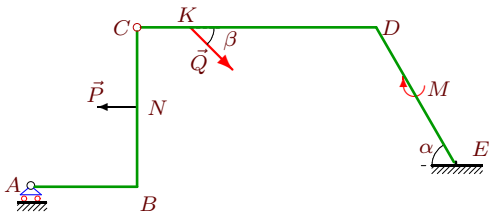
$P = 7$ кН, $Q = 4$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 3$ м, $BC = 4$ м, $CD = 9$ м,
$DE = 4$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.28.



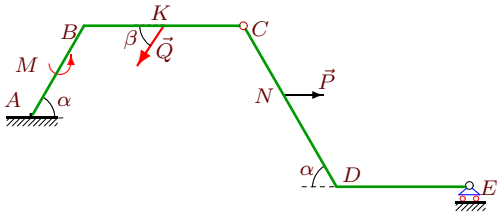
$P = 8$ кН, $Q = 5$ кН, $M = 9$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 6$ м, $CD = 10$ м,
$DE = 6$ м, $CN = 3$ м, $CK = 2$ м. $LD = 2$ м

Задача S7.29.



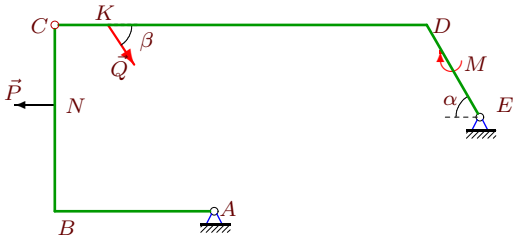
$P = 6$ кН, $Q = 8$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 4$ м, $BC = 6$ м, $CD = 9$ м,
$DE = 6$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.30.



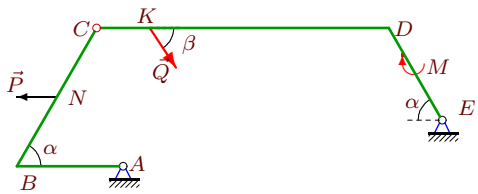
$P = 8$ кН, $Q = 6$ кН, $M = 7$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 4$ м, $BC = 6$ м, $CD = 7$ м,
$DE = 5$ м, $CN = 3$ м, $BK = 3$ м.

Задача S7.31.



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

Задача S7.32.



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

S7 **Ответы.**
Составная конструкция 04.03.2012

	X_A	Y_A	X_E	Y_E	S_{OL}	M
1	16.116	15.168	-9.893	9.729	–	
2	–	8.500	-0.062	57.000	–	-382.323
3	-4.501	7.664	8.001	8.006	–	
4	-8.482	74.832	–	11.100	–	716.567
5	–	13.500	6.671	49.807	–	-325.266
6	-2.487	8.149	1.830	8.194	–	
7	-2.803	8.007	12.046	8.750	–	
8	–	12.598	8.482	57.470	–	-206.670
9	-10.243	10.975	–	4.902	38.365	
10	14.821	16.685	-12.321	14.377	–	
11	–	1.500	7.188	69.739	–	-639.438
12	-1.062	7.562	–	-19.126	52.063	
13	22.203	21.674	-17.203	5.594	–	
14	–	5.100	-0.062	75.400	–	-690.223
15	1.050	2.660	–	-43.782	94.071	
16	–	4.964	7.500	88.902	–	-714.395
17	7.811	15.877	-16.364	12.918	–	
18	-6.000	60.005	–	9.459	–	380.827
19	-1.062	9.562	–	-79.563	133.501	
20	–	7.691	5.500	62.640	–	-432.147
21	-9.776	44.333	–	15.769	–	219.122
22	-7.732	74.500	–	1.500	–	625.677
23	10.508	20.018	-8.508	11.910	–	
24	0.928	88.804	–	-0.804	–	656.685
25	-8.500	57.434	–	10.700	–	318.803
26	1.928	-76.129	–	-13.010	151.139	
27	-2.029	6.731	7.994	9.406	–	
28	6.706	-40.060	–	-107.292	204.182	
29	–	1.500	-0.928	77.500	–	-597.677
30	-5.000	58.730	–	12.467	–	326.569
31	-23.434	33.840	28.364	4.888	–	
32	-3.113	21.363	9.337	6.535	–	

S7 файл o7s2B

1	$6.06 \cdot X_A - 7.5 \cdot Y_A + 16.06 = 0; \quad 2.6 \cdot X_A - 16.5 \cdot Y_A + 208.4 = 0.$
2	$Y_A = 25.5/(3);\ M_E = -518.32 + Y_A(16)$
3	$-3.46 \cdot X_A - 6 \cdot Y_A + 30.4 = 0; \quad 0 \cdot X_A - 16 \cdot Y_A + 122.63 = 0.$
4	$5 \cdot Y_E = 18 + 37.5;\ M_A = 838.67 - 11 \cdot Y_E;$
5	$Y_A = 40.5/(3);\ M_E = -541.27 + Y_A(16)$
6	$-4 \cdot X_A - 3 \cdot Y_A + 14.5 = 0; \quad -0.54 \cdot X_A - 16 \cdot Y_A + 129.05 = 0.$
7	$-5.2 \cdot X_A - 8 \cdot Y_A + 49.49 = 0; \quad -1.73 \cdot X_A - 16 \cdot Y_A + 123.26 = 0.$
8	$Y_A = 75.59/(6);\ M_E = -408.24 + Y_A(16)$
9	$-6 \cdot Y_E = 15.59 - 45;\ 8 \cdot Y_A = 8 \cdot Y_E + 6 - 385.35;$
10	$6 \cdot X_A - 5 \cdot Y_A - 5.5 = 0; \quad 0.8 \cdot X_A - 16 \cdot Y_A + 255.05 = 0.$
11	$Y_A = -6/(-4);\ M_E = -657.44 + Y_A(12)$
12	$16 \cdot Y_E + 12 \cdot S - 318.75 = 0; \quad 12 \cdot Y_E + 8 \cdot S - 187 = 0.$
13	$-3.46 \cdot X_A + 3 \cdot Y_A + 11.9 = 0; \quad 2.54 \cdot X_A - 11 \cdot Y_A + 182.1 = 0.$
14	$Y_A = -25.5/(-5);\ M_E = -746.32 + Y_A(11)$
15	$16 \cdot Y_E + 12 \cdot S - 428.35 = 0; \quad 11 \cdot Y_E + 7 \cdot S - 176.9 = 0.$
16	$Y_A = -19.86/(-4);\ M_E = -764.04 + Y_A(10)$
17	$5.2 \cdot X_E + 8 \cdot Y_E - 18.31 = 0; \quad 1.2 \cdot X_E + 16 \cdot Y_E - 187.12 = 0.$
18	$-7 \cdot Y_E = 20.78 - 87;\ M_A = 532.18 - 16 \cdot Y_E;$
19	$10 \cdot Y_E + 6 \cdot S - 5.37 = 0; \quad 16 \cdot Y_E + 12 \cdot S - 329 = 0.$
20	$Y_A = 46.14/(6);\ M_E = -559.04 + Y_A(16.5)$
21	$-7 \cdot Y_E = -23.38 - 87;\ M_A = 471.42 - 16 \cdot Y_E;$
22	$-4 \cdot Y_E = 18 - 24;\ M_A = 649.68 - 16 \cdot Y_E;$
23	$7 \cdot X_A - 3 \cdot Y_A - 13.5 = 0; \quad 3.54 \cdot X_A - 16 \cdot Y_A + 283.14 = 0.$
24	$2 \cdot Y_E = 10.4 - 12;\ M_A = 647.04 - 12 \cdot Y_E;$
25	$-5 \cdot Y_E = -16 - 37.5;\ M_A = 490 - 16 \cdot Y_E;$
26	$1 \cdot Y_E = 13 - 26;\ 4 \cdot Y_A = 8 \cdot Y_E + 6 - 448.44;$
27	$-3.46 \cdot X_A - 5 \cdot Y_A + 26.62 = 0; \quad 0 \cdot X_A - 16 \cdot Y_A + 107.69 = 0.$
28	$12 \cdot Y_E + 7 \cdot S - 141.77 = 0; \quad 13 \cdot Y_E + 8 \cdot S - 238.66 = 0.$
29	$Y_A = 6/(4);\ M_E = -621.68 + Y_A(16)$
30	$-8.5 \cdot Y_E = 20.78 - 126.75;\ M_A = 532.27 - 16.5 \cdot Y_E;$
31	$7 \cdot X_A + 6 \cdot Y_A - 39 = 0; \quad 3.54 \cdot X_A - 10 \cdot Y_A + 421.26 = 0.$
32	$5.2 \cdot X_A + 1 \cdot Y_A - 5.19 = 0; \quad 1.73 \cdot X_A - 12 \cdot Y_A + 261.75 = 0.$