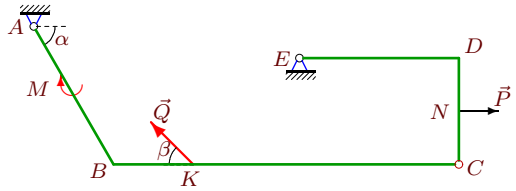
Составная конструкция

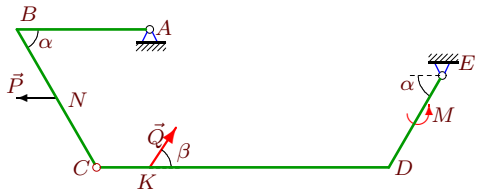
Определить реакции опор конструкции (в кН), состоящей из двух тел. Конструкция расположена в вертикальной плоскости. Дан погонный вес ρ.

Задача S7.1.



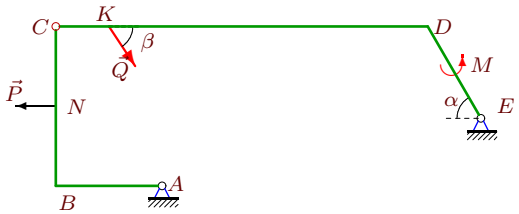
$P = 4$ кН, $Q = 1$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 6$ м, $BC = 13$ м, $CD = 4$ м,
$DE = 6$ м, $CN = 2$ м, $BK = 3$ м.

Задача S7.2.



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

Задача S7.3.

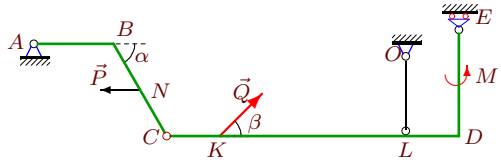


$P = 6$ кН, $Q = 7$ кН, $M = 7$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 4$ м, $BC = 6$ м, $CD = 14$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.4.

$P = 7$ кН, $Q = 8$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 13$ м, $CD = 6$ м,
$DE = 4$ м, $CN = 3$ м, $BK = 3$ м.

Задача S7.5.

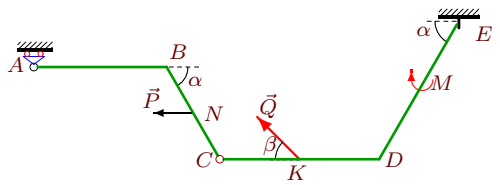


$P = 5$ кН, $Q = 1$ кН, $M = 3$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 3$ м, $BC = 4$ м, $CD = 11$ м,
$DE = 4$ м, $CN = 2$ м, $CK = 2$ м. $LD = 2$ м

Задача S7.6.

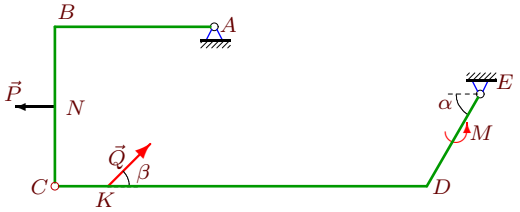
$P = 8$ кН, $Q = 8$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 4$ м, $BC = 4$ м, $CD = 14$ м,
$DE = 4$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.7.



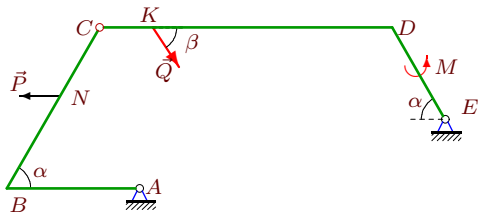
$P = 6$ кН, $Q = 5$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 5$ м, $BC = 4$ м, $CD = 6$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 3$ м.

Задача S7.8.



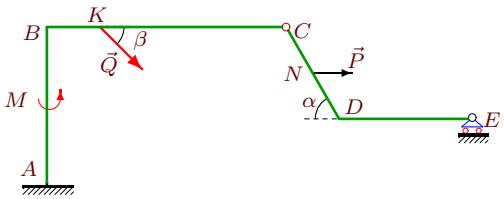
$P = 5$ кН, $Q = 7$ кН, $M = 5$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 6$ м, $BC = 6$ м, $CD = 14$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.9.



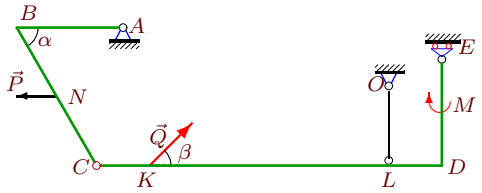
$P = 7$ кН, $Q = 6$ кН, $M = 9$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 5$ м, $BC = 7$ м, $CD = 11$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.10.



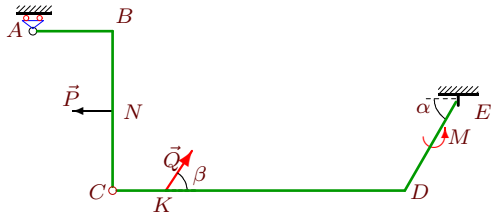
$P = 7$ кН, $Q = 7$ кН, $M = 5$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 6$ м, $BC = 9$ м, $CD = 4$ м,
$DE = 5$ м, $CN = 2$ м, $BK = 2$ м.

Задача S7.11.



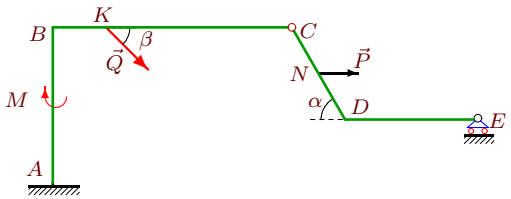
$P = 6$ кН, $Q = 1$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 6$ м, $CD = 13$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м. $LD = 2$ м

Задача S7.12.



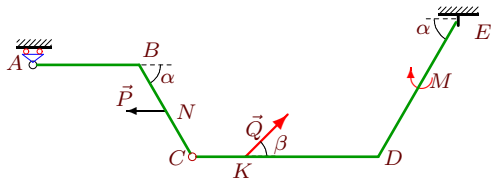
$P = 9$ кН, $Q = 7$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 3$ м, $BC = 6$ м, $CD = 11$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.13.



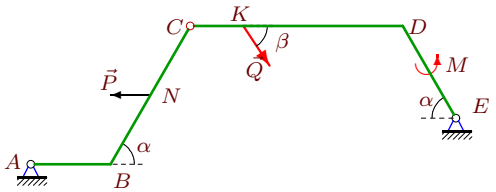
$P = 6$ кН, $Q = 7$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 6$ м, $BC = 9$ м, $CD = 4$ м,
$DE = 5$ м, $CN = 2$ м, $BK = 2$ м.

Задача S7.14.



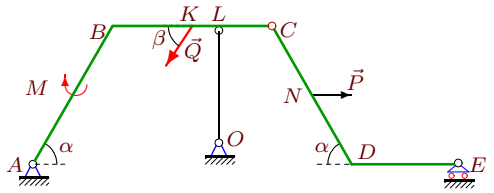
$P = 7$ кН, $Q = 5$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 4$ м, $CD = 7$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.15.



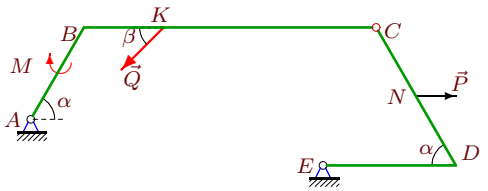
$P = 6$ кН, $Q = 4$ кН, $M = 7$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 3$ м, $BC = 6$ м, $CD = 8$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.16.



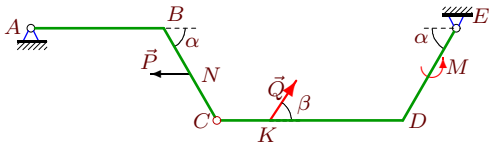
$P = 7$ кН, $Q = 5$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 6$ м, $BC = 6$ м, $CD = 6$ м,
$DE = 4$ м, $CN = 3$ м, $BK = 3$ м. $LC = 2$ м.

Задача S7.17.



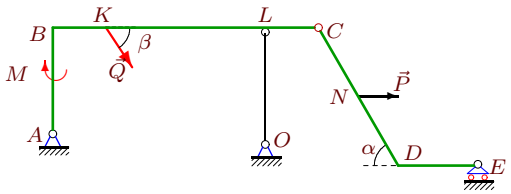
$P = 5$ кН, $Q = 6$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 11$ м, $CD = 6$ м,
$DE = 5$ м, $CN = 3$ м, $BK = 3$ м.

Задача S7.18.



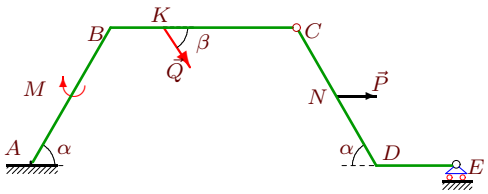
$P = 6$ кН, $Q = 4$ кН, $M = 7$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 5$ м, $BC = 4$ м, $CD = 7$ м,
$DE = 4$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.19.



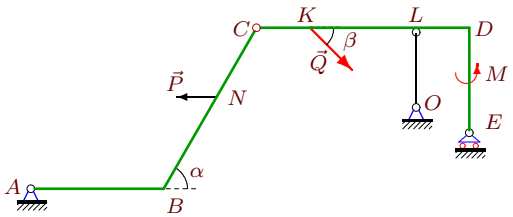
$P = 8$ кН, $Q = 8$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 10$ м, $CD = 6$ м,
$DE = 3$ м, $CN = 3$ м, $BK = 2$ м. $LC = 2$ м.

Задача S7.20.



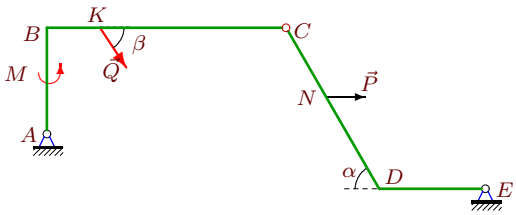
$P = 9$ кН, $Q = 4$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 7$ м, $CD = 6$ м,
$DE = 3$ м, $CN = 3$ м, $BK = 2$ м.

Задача S7.21.



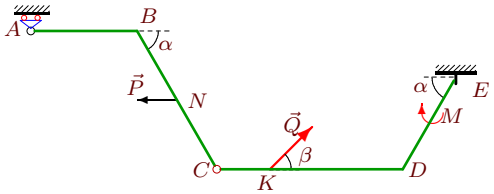
$P = 5$ кН, $Q = 2$ кН, $M = 3$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 5$ м, $BC = 7$ м, $CD = 8$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м. $LD = 2$ м

Задача S7.22.



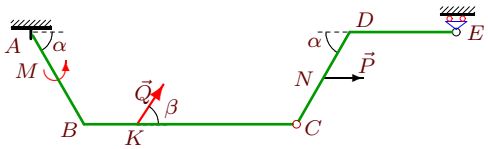
$P = 7$ кН, $Q = 8$ кН, $M = 9$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 9$ м, $CD = 7$ м,
$DE = 4$ м, $CN = 3$ м, $BK = 2$ м.

Задача S7.23.



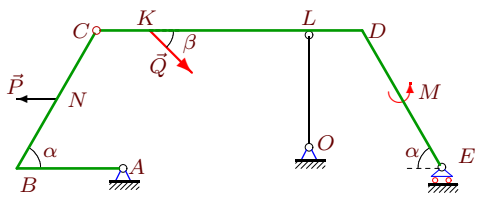
$P = 6$ кН, $Q = 4$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 4$ м, $BC = 6$ м, $CD = 7$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.

Задача S7.24.



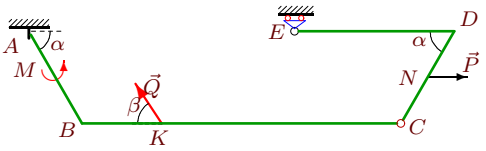
$P = 9$ кН, $Q = 3$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 8$ м, $CD = 4$ м,
$DE = 4$ м, $CN = 2$ м, $BK = 2$ м.

Задача S7.25.



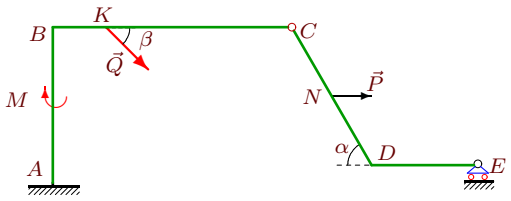
$P = 5$ кН, $Q = 6$ кН, $M = 3$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 4$ м, $BC = 6$ м, $CD = 10$ м,
$DE = 6$ м, $CN = 3$ м, $CK = 2$ м. $LD = 2$ м

Задача S7.26.



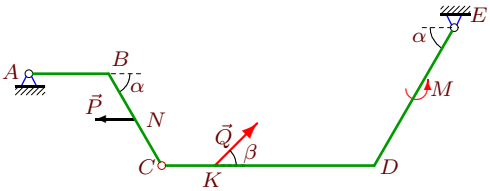
$P = 8$ кН, $Q = 5$ кН, $M = 7$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 4$ м, $BC = 12$ м, $CD = 4$ м,
$DE = 6$ м, $CN = 2$ м, $BK = 3$ м.

Задача S7.27.



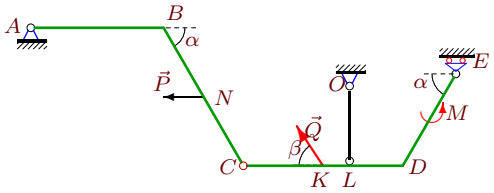
$P = 7$ кН, $Q = 6$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 6$ м, $BC = 9$ м, $CD = 6$ м,
$DE = 4$ м, $CN = 3$ м, $BK = 2$ м.

Задача S7.28.



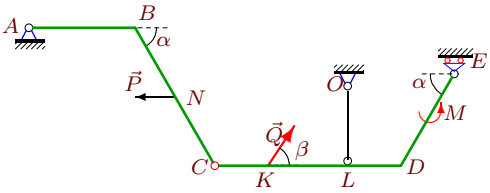
$P = 5$ кН, $Q = 6$ кН, $M = 5$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 3$ м, $BC = 4$ м, $CD = 8$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.29.



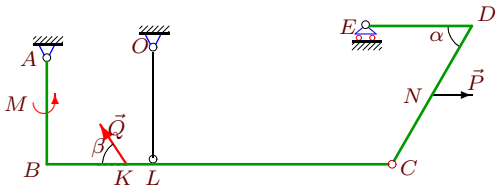
$P = 7$ кН, $Q = 4$ кН, $M = 7$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 5$ м, $BC = 6$ м, $CD = 6$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 3$ м. $LD = 2$ м

Задача S7.30.



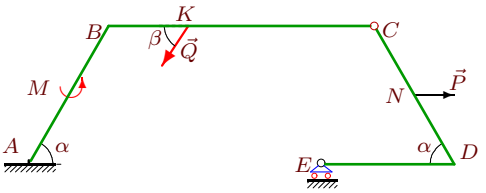
$P = 8$ кН, $Q = 6$ кН, $M = 9$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 6$ м, $CD = 7$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м. $LD = 2$ м

Задача S7.31.



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

Задача S7.32.



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

S7 Ответы.
Составная конструкция 04.03.2012

	X_A	Y_A	X_E	Y_E	S_{OL}	M
1	42.483	-3.578	-45.617	32.078	–	
2	11.640	16.697	-8.140	4.972	–	
3	-13.953	27.429	16.453	6.633	–	
4	4.198	3.033	-9.127	16.239	–	
5	4.134	4.668	–	-72.244	111.076	
6	–	2.000	4.000	69.072	–	-622.149
7	–	12.842	10.330	47.658	–	-184.747
8	19.905	20.405	-19.855	4.645	–	
9	-6.643	27.472	12.090	5.324	–	
10	-11.950	67.325	–	9.625	–	354.472
11	5.293	-14.086	–	-231.790	299.168	
12	–	13.500	7.188	51.739	–	-344.723
13	-12.062	65.627	–	9.873	–	364.020
14	–	12.021	3.464	47.444	–	-228.007
15	14.768	13.941	-10.768	10.523	–	
16	-4.500	3.475	–	5.688	39.168	
17	-8.895	8.356	8.137	21.887	–	
18	-5.678	8.080	9.678	8.455	–	
19	-10.071	12.019	–	4.036	37.672	
20	-10.035	62.511	–	7.353	–	440.434
21	3.268	10.744	–	-51.269	89.526	
22	5.383	17.903	-14.454	13.825	–	
23	–	14.655	2.536	46.345	–	-233.816
24	-9.776	44.504	–	12.598	–	215.561
25	-0.196	-11.990	–	-58.985	125.975	
26	-5.500	75.634	–	-1.964	–	699.794
27	-11.243	69.412	–	9.830	–	387.967
28	-4.208	7.547	4.965	9.210	–	
29	9.000	5.553	–	-14.331	47.315	
30	6.447	6.469	–	-14.067	43.802	
31	-2.500	-150.368	–	-44.187	240.761	
32	-7.706	91.388	–	-5.559	–	828.281

S7 файл o7s7B

1	$-4 \cdot X_E - 6 \cdot Y_E + 10 = 0;\quad 1.2 \cdot X_E + 10 \cdot Y_E - 266.22 = 0.$
2	$-5.2 \cdot X_A + 2 \cdot Y_A + 27.09 = 0;\quad -1.73 \cdot X_A - 11 \cdot Y_A + 203.83 = 0.$
3	$6 \cdot X_A + 4 \cdot Y_A - 26 = 0;\quad 2.54 \cdot X_A - 12 \cdot Y_A + 364.53 = 0.$
4	$-5.2 \cdot X_E - 1 \cdot Y_E - 31.19 = 0;\quad -1.2 \cdot X_E + 12 \cdot Y_E - 205.79 = 0.$
5	$16 \cdot Y_E + 14 \cdot S - 399.16 = 0;\quad 11 \cdot Y_E + 9 \cdot S - 205 = 0.$
6	$Y_A = -8/(-4);\ M_E = -646.15 + Y_A(12)$
7	$Y_A = 89.9/(7);\ M_E = -390.22 + Y_A(16)$
8	$-6 \cdot X_A + 6 \cdot Y_A - 3 = 0;\quad -2.54 \cdot X_A - 10 \cdot Y_A + 254.53 = 0.$
9	$6.06 \cdot X_A + 1.5 \cdot Y_A - 0.94 = 0;\quad 2.6 \cdot X_A - 11.5 \cdot Y_A + 333.18 = 0.$
10	$-7 \cdot Y_E = 12.12 - 79.5;\ M_A = 508.47 - 16 \cdot Y_E;$
11	$12 \cdot Y_E + 10 \cdot S - 210.2 = 0;\quad 13 \cdot Y_E + 11 \cdot S - 277.59 = 0.$
12	$Y_A = 40.5/(3);\ M_E = -560.72 + Y_A(16)$
13	$-7 \cdot Y_E = 10.4 - 79.5;\ M_A = 521.98 - 16 \cdot Y_E;$
14	$Y_A = 72.12/(6);\ M_E = -420.34 + Y_A(16)$
15	$5.2 \cdot X_A - 6 \cdot Y_A + 6.91 = 0;\quad 1.73 \cdot X_A - 16 \cdot Y_A + 197.48 = 0.$
16	$-7 \cdot Y_E = 18.19 - 58;\ 7 \cdot Y_A = 9 \cdot Y_E + 5.2 - 365.18;$
17	$5.2 \cdot X_E - 2 \cdot Y_E + 1.49 = 0;\quad 1.73 \cdot X_E + 11 \cdot Y_E - 254.85 = 0.$
18	$-3.46 \cdot X_A - 7 \cdot Y_A + 36.9 = 0;\quad 0 \cdot X_A - 16 \cdot Y_A + 129.29 = 0.$
19	$-6 \cdot Y_E = 20.78 - 45;\ 8 \cdot Y_A = 8 \cdot Y_E + 4 - 378;$
20	$-6 \cdot Y_E = 23.38 - 67.5;\ M_A = 558.08 - 16 \cdot Y_E;$
21	$16.5 \cdot Y_E + 14.5 \cdot S - 452.18 = 0;\quad 8 \cdot Y_E + 6 \cdot S - 127 = 0.$
22	$6.06 \cdot X_E + 7.5 \cdot Y_E - 16.06 = 0;\quad 2.06 \cdot X_E + 16.5 \cdot Y_E - 198.3 = 0.$
23	$Y_A = 102.59/(7);\ M_E = -468.3 + Y_A(16)$
24	$-6 \cdot Y_E = -15.59 - 60;\ M_A = 417.13 - 16 \cdot Y_E;$
25	$12 \cdot Y_E + 7 \cdot S - 174 = 0;\quad 13 \cdot Y_E + 8 \cdot S - 241 = 0.$
26	$4 \cdot Y_E = -13.86 + 6;\ M_A = 680.15 - 10 \cdot Y_E;$
27	$-7 \cdot Y_E = 18.19 - 87;\ M_A = 545.25 - 16 \cdot Y_E;$
28	$-3.46 \cdot X_A - 5 \cdot Y_A + 23.16 = 0;\quad 1.73 \cdot X_A - 16 \cdot Y_A + 128.04 = 0.$
29	$16 \cdot Y_E + 12 \cdot S - 338.47 = 0;\quad 8 \cdot Y_E + 4 \cdot S - 74.6 = 0.$
30	$16 \cdot Y_E + 12 \cdot S - 300.56 = 0;\quad 9 \cdot Y_E + 5 \cdot S - 92.4 = 0.$
31	$1 \cdot Y_E = -18.19 - 26;\ 4 \cdot Y_A = 8 \cdot Y_E - 4 - 442.8;$
32	$2 \cdot Y_E = 23.38 - 34.5;\ M_A = 767.14 - 11 \cdot Y_E;$