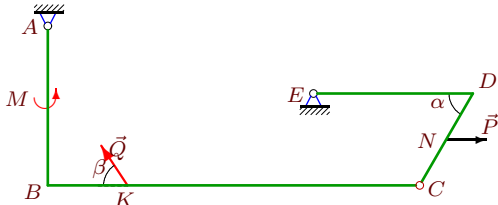# Составная конструкция

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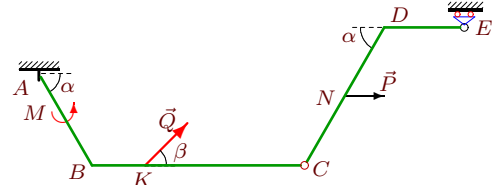
Задача S7.1.

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

Задача S7.2.
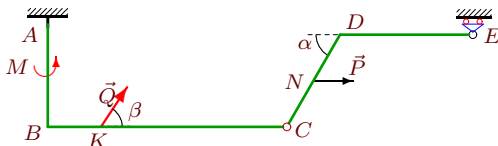

$P = 6$ кН, $Q = 5$ кН, $M = 3$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 30°$,
$AB = 4$ м, $BC = 8$ м, $CD = 6$ м,
$DE = 3$ м, $CN = 3$ м, $BK = 2$ м.

Задача S7.3.
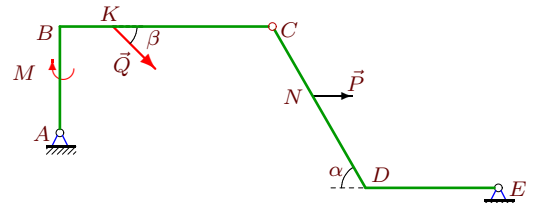

$P = 8$ кН, $Q = 9$ кН, $M = 7$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 4$ м, $BC = 9$ м, $CD = 4$ м,
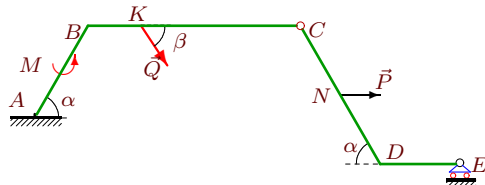$DE = 5$ м, $CN = 2$ м, $BK = 2$ м.

Задача S7.4.

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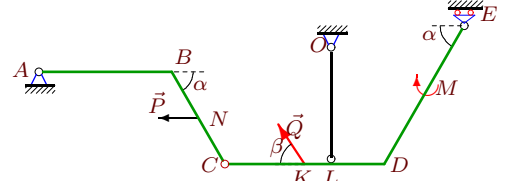$DE = 5$ м, $CN = 3$ м, $BK = 2$ м.

Задача S7.5.

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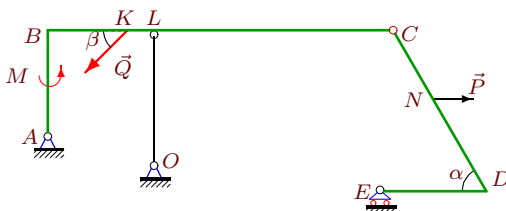$DE = 3$ м, $CN = 3$ м, $BK = 2$ м.

Задача S7.6.

$P = 7$ кН, $Q = 5$ 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 S7.7.

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

Задача S7.8.

$P = 9$ кН, $Q = 4$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 4$ м, $CD = 12$ м,
$DE = 4$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.9.

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

Задача S7.10.

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

Задача S7.11.

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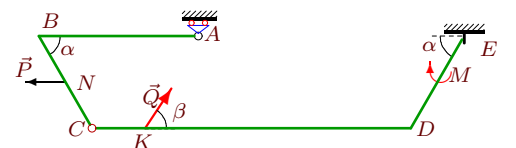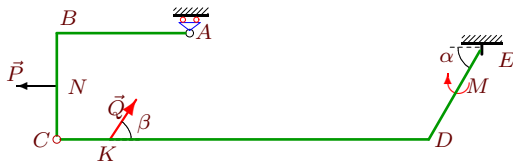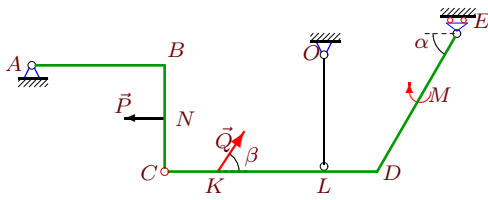$DE = 6$ м, $CN = 2$ м, $CK = 2$ м. $LD = 2$ м

Задача S7.12.

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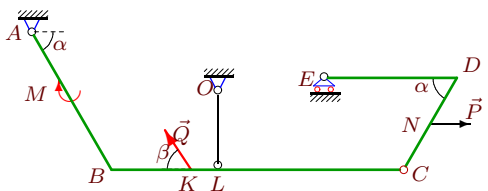
Задача S7.13.

$P = 8$ кН, $Q = 5$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 11$ м, $CD = 4$ м,
$DE = 5$ м, $CN = 2$ м, $BK = 3$ м. $LC = 7$ м.

Задача S7.14.

$P = 7$ кН, $Q = 5$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 12$ м, $CD = 4$ м,
$DE = 5$ м, $CN = 2$ м, $BK = 3$ м.
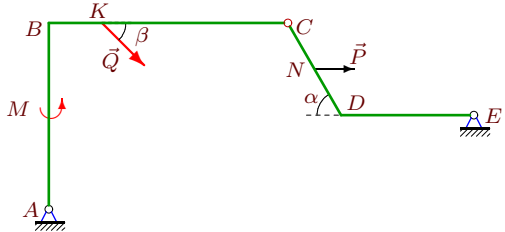
Задача S7.15.

$P = 5$ кН, $Q = 7$ кН, $M = 5$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 7$ м, $BC = 9$ м, $CD = 4$ м,
$DE = 5$ м, $CN = 2$ м, $BK = 2$ м.
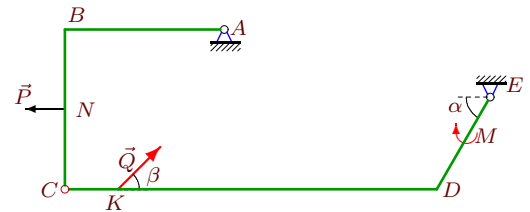
Задача S7.16.

$P = 5$ кН, $Q = 6$ кН, $M = 3$ 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 S7.17.
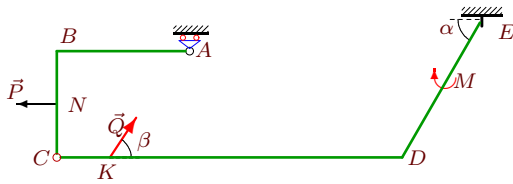
$P = 8$ кН, $Q = 7$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 5$ м, $BC = 4$ м, $CD = 13$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.

Задача S7.18.

$P = 6$ кН, $Q = 4$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 60°$,
$AB = 4$ м, $BC = 11$ м, $CD = 6$ м,
$DE = 6$ м, $CN = 3$ м, $BK = 3$ м.
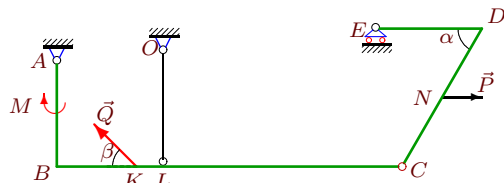
Задача S7.19.

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

Задача S7.20.

$P = 9$ кН, $Q = 8$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 4$ м, $CD = 13$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.
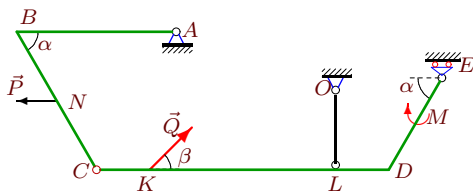
Задача S7.21.

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

Задача S7.22.

$P = 7$ кН, $Q = 3$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 4$ м, $CD = 12$ м,
$DE = 4$ м, $CN = 2$ м, $CK = 2$ м.
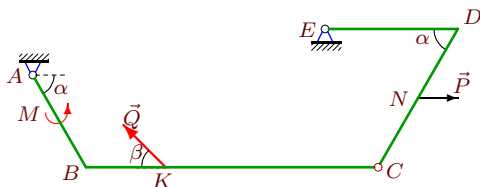
Задача S7.23.

$P = 5$ кН, $Q = 4$ кН, $M = 5$ 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.
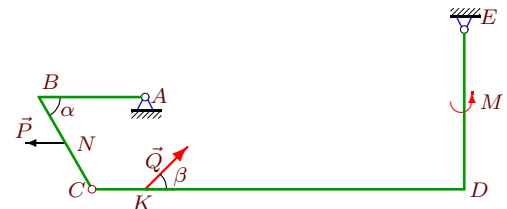
Задача S7.24.

$P = 5$ кН, $Q = 1$ кН, $M = 5$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 4$ м, $CD = 14$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.
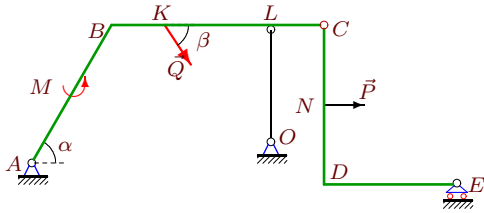
$P = 8$ кН, $Q = 1$ кН, $M = 9$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 6$ м, $BC = 8$ м, $CD = 6$ м,
$DE = 5$ м, $CN = 3$ м, $BK = 2$ м. $LC = 2$ м.

$P = 8$ кН, $Q = 2$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 14$ м, $CD = 4$ м,
$DE = 4$ м, $CN = 2$ м, $BK = 3$ м. $LC = 10$ м.
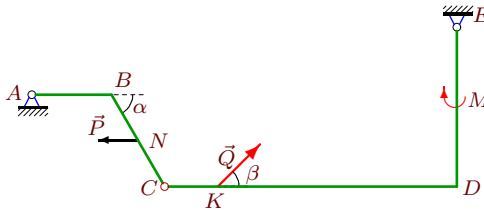
$P = 5$ кН, $Q = 1$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 3$ м, $BC = 4$ м, $CD = 11$ м,
$DE = 6$ м, $CN = 2$ м, $CK = 2$ м.

$P = 5$ кН, $Q = 4$ кН, $M = 5$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 6$ м, $BC = 6$ м, $CD = 11$ м,
$DE = 4$ м, $CN = 3$ м, $CK = 2$ м.
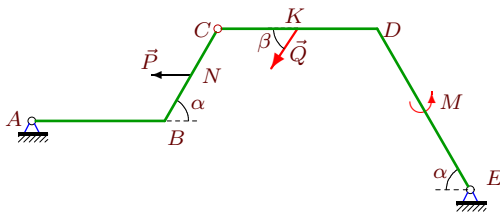
$P = 7$ кН, $Q = 5$ кН, $M = 9$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 5$ м, $BC = 4$ м, $CD = 6$ м,
$DE = 7$ м, $CN = 2$ м, $CK = 3$ м.

$P = 9$ кН, $Q = 5$ кН, $M = 9$ кНм,
$\rho = 3$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 4$ м, $BC = 4$ м, $CD = 12$ м,
$DE = 4$ м, $CN = 2$ м, $CK = 2$ м.
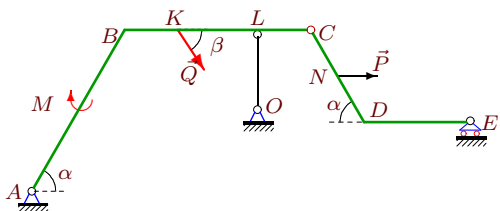
$P = 8$ кН, $Q = 6$ кН, $M = 6$ кНм,
$\rho = 2$ кН/м, $\alpha = 60°$, $\beta = 75°$,
$AB = 7$ м, $BC = 7$ м, $CD = 4$ м,
$DE = 4$ м, $CN = 2$ м, $BK = 2$ м. $LC = 2$ м.
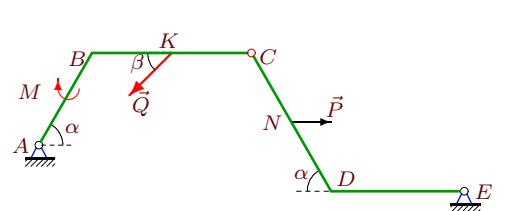
$P = 5$ кН, $Q = 6$ кН, $M = 3$ кНм,
$\rho = 1$ кН/м, $\alpha = 60°$, $\beta = 45°$,
$AB = 4$ м, $BC = 6$ м, $CD = 6$ м,
$DE = 5$ м, $CN = 3$ м, $BK = 3$ м.

	X_A	Y_A	X_E	Y_E	S_{OL}	M
1	34.596	-6.090	-37.096	30.028	–	
2	-10.330	46.652	–	13.848	–	238.735
3	-12.500	44.869	–	13.337	–	171.882
4	5.561	14.648	-16.218	15.009	–	
5	-9.776	58.545	–	7.353	–	388.929
6	9.500	4.602	–	-2.652	35.720	
7	1.062	-160.856	–	-47.019	267.375	
8	–	-2.397	7.965	76.533	–	-670.605
9	–	3.900	7.188	70.339	–	-631.038
10	-9.259	77.466	–	-4.500	–	713.937
11	5.929	3.456	–	-8.070	42.886	
12	5.966	10.645	-13.966	14.819	–	
13	-6.706	-15.474	–	-5.619	68.263	
14	-3.464	77.006	–	-5.541	–	734.901
15	5.164	19.922	-15.114	10.028	–	
16	19.861	20.361	-19.104	5.396	–	
17	–	4.300	4.500	73.638	–	-643.447
18	12.841	2.562	-16.841	20.974	–	
19	2.794	-146.398	–	-38.990	234.888	
20	–	6.000	6.929	73.273	–	-646.310
21	1.536	-7.670	–	-79.507	139.177	
22	12.776	14.066	-6.552	7.036	–	
23	9.772	4.386	-11.944	18.785	–	
24	14.762	19.238	-10.469	8.055	–	
25	-8.259	5.372	–	0.200	45.394	
26	-7.482	-31.002	–	0.000	81.070	
27	-3.775	7.248	8.068	16.045	–	
28	15.964	20.320	-13.792	3.851	–	
29	19.317	11.613	-11.022	15.217	–	
30	–	-13.794	7.706	80.965	–	-753.470
31	-9.553	5.375	–	4.357	40.063	
32	13.714	12.904	-14.472	12.338	–	

S7 файл   o7s9B

1	$-3.46 \cdot X_E - 4 \cdot Y_E - 8.4 = 0; \quad 2.54 \cdot X_E + 10 \cdot Y_E - 206.2 = 0.$
2	$-6 \cdot Y_E = -15.59 - 67.5; \ M_A = 460.3 - 16 \cdot Y_E;$
3	$-7 \cdot Y_E = -13.86 - 79.5; \ M_A = 385.27 - 16 \cdot Y_E;$
4	$6.06 \cdot X_E + 8.5 \cdot Y_E - 29.26 = 0; \quad 2.06 \cdot X_E + 16.5 \cdot Y_E - 214.2 = 0.$
5	$-6 \cdot Y_E = 23.38 - 67.5; \ M_A = 506.58 - 16 \cdot Y_E;$
6	$16 \cdot Y_E + 11 \cdot S - 350.48 = 0; \quad 9 \cdot Y_E + 4 \cdot S - 119 = 0.$
7	$0.5 \cdot Y_E = 13 - 36.5; \ 4 \cdot Y_A = 8.5 \cdot Y_E + 4 - 479.57;$
8	$Y_A = 9.59/(-4); \ M_E = -646.63 + Y_A(10)$
9	$Y_A = -19.5/(-5); \ M_E = -673.94 + Y_A(11)$
10	$-3 \cdot Y_E = 27 - 13.5; \ M_A = 641.94 - 16 \cdot Y_E;$
11	$16 \cdot Y_E + 11 \cdot S - 342.63 = 0; \quad 11 \cdot Y_E + 6 \cdot S - 168.55 = 0.$
12	$6.06 \cdot X_E + 6.5 \cdot Y_E - 11.66 = 0; \quad 2.6 \cdot X_E + 16.5 \cdot Y_E - 208.23 = 0.$
13	$3 \cdot Y_E = -13.86 - 3; \ 7 \cdot Y_A = 4 \cdot Y_E - 5.2 - 450.88;$
14	$3 \cdot Y_E = -12.12 - 4.5; \ M_A = 673.95 - 11 \cdot Y_E;$
15	$3.46 \cdot X_E + 7 \cdot Y_E - 17.84 = 0; \quad -3.54 \cdot X_E + 16 \cdot Y_E - 213.89 = 0.$
16	$-6 \cdot X_A + 6 \cdot Y_A - 3 = 0; \quad -2.54 \cdot X_A - 10 \cdot Y_A + 253.98 = 0.$
17	$Y_A = -21.5/(-5); \ M_E = -690.75 + Y_A(11)$
18	$-5.2 \cdot X_E - 3 \cdot Y_E - 24.59 = 0; \quad -1.73 \cdot X_E + 10 \cdot Y_E - 238.91 = 0.$
19	$1 \cdot Y_E = -13 - 26; \ 4 \cdot Y_A = 8 \cdot Y_E - 4 - 460.49;$
20	$Y_A = -36/(-6); \ M_E = -706.31 + Y_A(10)$
21	$10 \cdot Y_E + 6 \cdot S - 40 = 0; \quad 13 \cdot Y_E + 9 \cdot S - 219 = 0.$
22	$-3.46 \cdot X_A + 2 \cdot Y_A + 16.12 = 0; \quad 0 \cdot X_A - 12 \cdot Y_A + 168.8 = 0.$
23	$-5.2 \cdot X_E - 2 \cdot Y_E - 24.49 = 0; \quad -1.73 \cdot X_E + 11 \cdot Y_E - 227.33 = 0.$
24	$-3.46 \cdot X_A + 2 \cdot Y_A + 12.66 = 0; \quad 2.54 \cdot X_A - 12 \cdot Y_A + 193.42 = 0.$
25	$-5 \cdot Y_E = 24 - 25; \ 9 \cdot Y_A = 7 \cdot Y_E + 5.2 - 418.38;$
26	$4 \cdot Y_E = -16 + 16; \ 6 \cdot Y_A = 6 \cdot Y_E - 3.46 - 512.34;$
27	$-3.46 \cdot X_A - 5 \cdot Y_A + 23.16 = 0; \quad 2.54 \cdot X_A - 16 \cdot Y_A + 125.54 = 0.$
28	$-5.2 \cdot X_A + 3 \cdot Y_A + 22 = 0; \quad -1.73 \cdot X_A - 10 \cdot Y_A + 230.86 = 0.$
29	$3.46 \cdot X_A - 7 \cdot Y_A + 14.38 = 0; \quad -2.6 \cdot X_A - 16.5 \cdot Y_A + 241.8 = 0.$
30	$Y_A = 27.59/(-2); \ M_E = -587.94 + Y_A(12)$
31	$-6 \cdot Y_E = 13.86 - 40; \ 8.5 \cdot Y_A = 8 \cdot Y_E + 6.06 - 412.43;$
32	$5.2 \cdot X_E + 8 \cdot Y_E - 23.51 = 0; \quad 1.73 \cdot X_E + 16 \cdot Y_E - 172.35 = 0.$