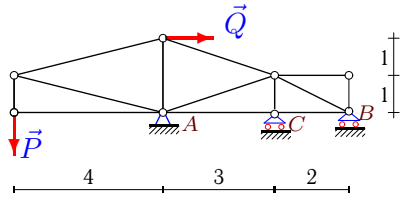
Расчет статически неопределимой фермы

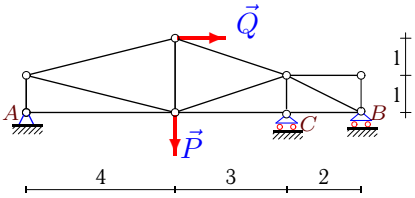
Найти реакции опор фермы.

Задача М8.1. 2



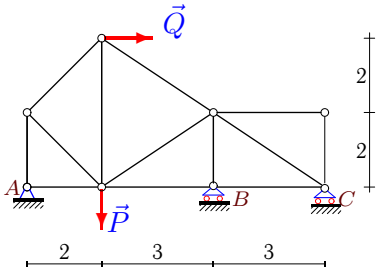
$P = 11$ кН,
$Q = 8$ кН.

Задача М8.2. 2



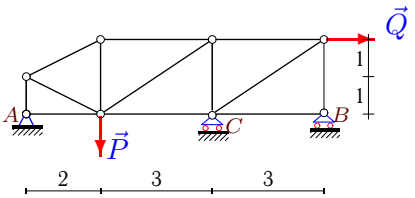
$P = 5$ кН,
$Q = 3$ кН.

Задача М8.3. 2



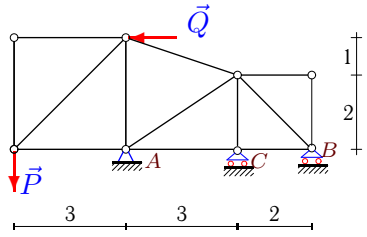
$P = 6$ кН,
$Q = 9$ кН.

Задача М8.4. 2



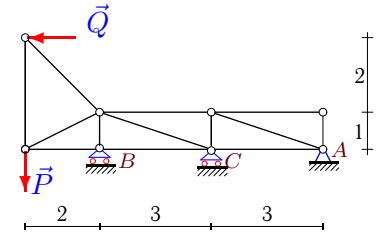
$P = 11$ кН,
$Q = 6$ кН.

Задача М8.5. 2



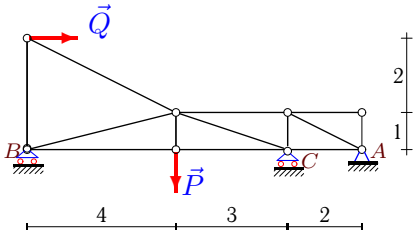
$P = 9$ кН,
$Q = 7$ кН.

Задача М8.6. 2



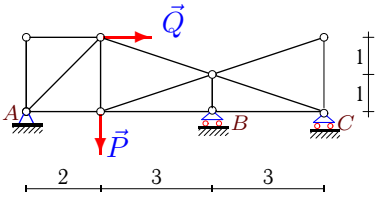
$P = 6$ кН,
$Q = 5$ кН.

Задача М8.7. 2



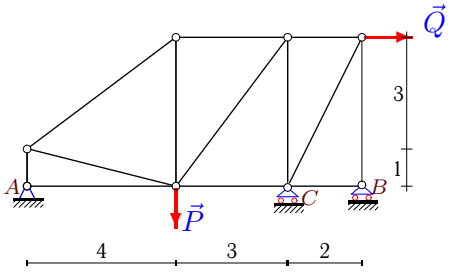
$P = 11$ кН,
$Q = 9$ кН.

Задача М8.8. 2



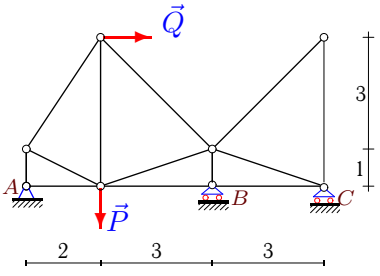
$P = 9$ кН,
$Q = 3$ кН.

Задача М8.9. 2



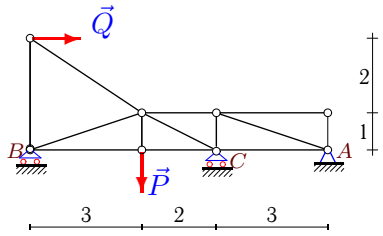
$P = 10$ кН,
$Q = 9$ кН.

Задача М8.10. 2



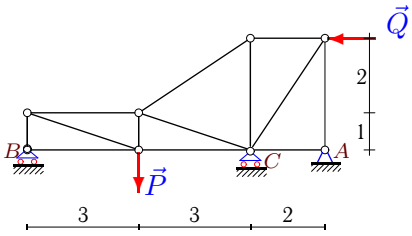
$P = 11$ кН,
$Q = 4$ кН.

Задача М8.11.



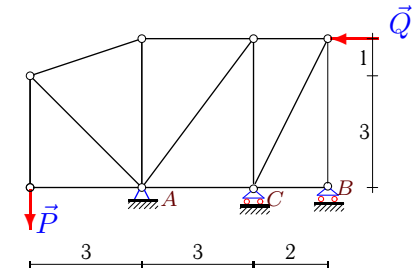
$P = 7$ кН,
$Q = 4$ кН.

Задача М8.12.



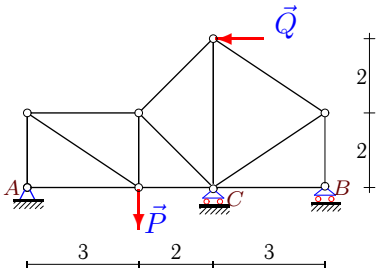
$P = 8$ кН,
$Q = 4$ кН.

Задача М8.13.



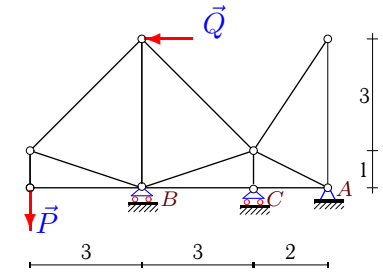
$P = 10$ кН,
$Q = 9$ кН.

Задача М8.14.



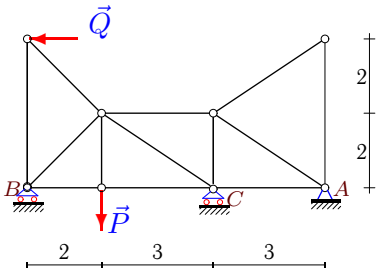
$P = 8$ кН,
$Q = 7$ кН.

Задача М8.15.



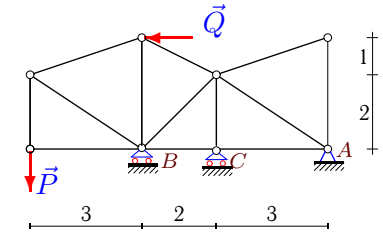
$P = 7$ кН,
$Q = 8$ кН.

Задача М8.16.



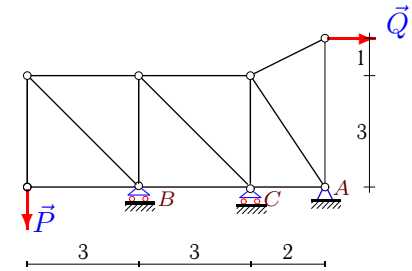
$P = 8$ кН,
$Q = 5$ кН.

Задача М8.17.



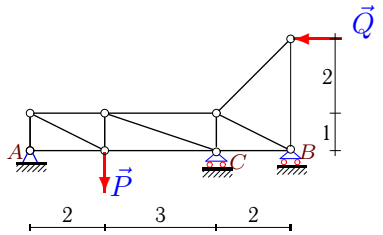
$P = 6$ кН,
$Q = 4$ кН.

Задача М8.18.



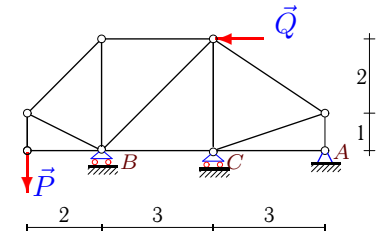
$P = 9$ кН,
$Q = 7$ кН.

Задача М8.19.



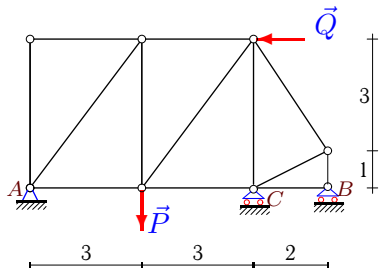
$P = 7$ кН,
$Q = 5$ кН.

Задача М8.20.



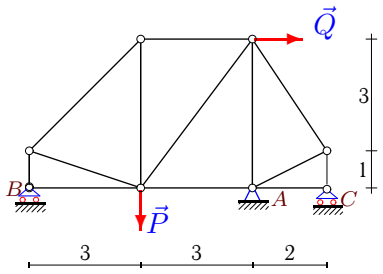
$P = 8$ кН,
$Q = 8$ кН.

Задача М8.21.



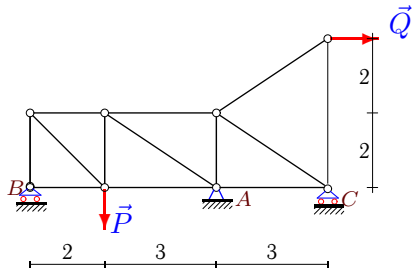
$P = 5$ кН,
$Q = 8$ кН.

Задача М8.22.



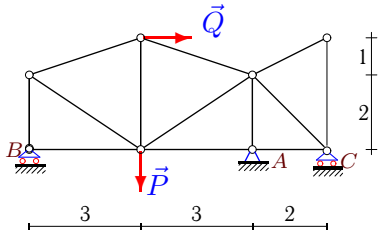
$P = 6$ кН,
$Q = 9$ кН.

Задача М8.23.



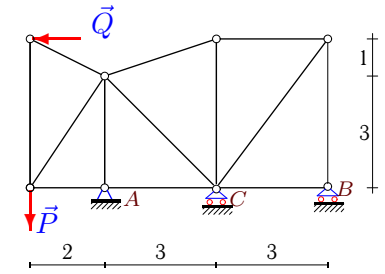
$P = 9$ кН,
$Q = 4$ кН.

Задача М8.24.



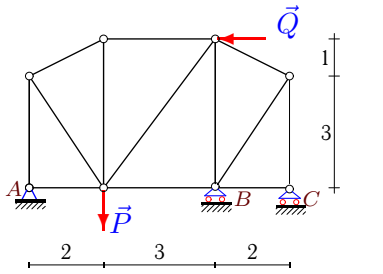
$P = 12$ кН,
$Q = 4$ кН.

Задача М8.25.



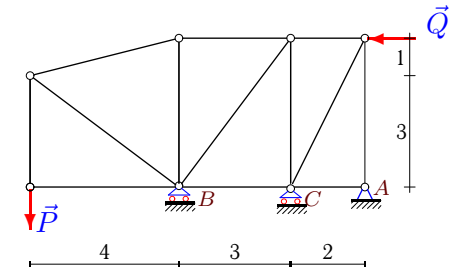
$P = 6$ кН,
$Q = 5$ кН.

Задача М8.26.



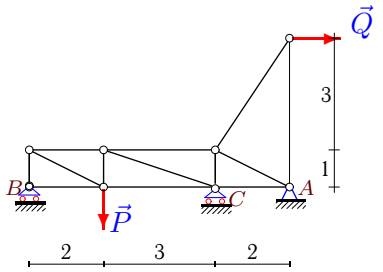
$P = 11$ кН,
$Q = 4$ кН.

Задача М8.27.



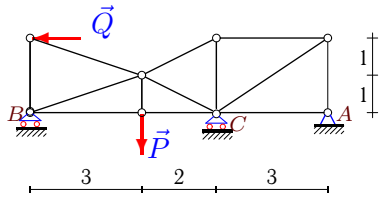
$P = 5$ кН,
$Q = 5$ кН.

Задача М8.28.



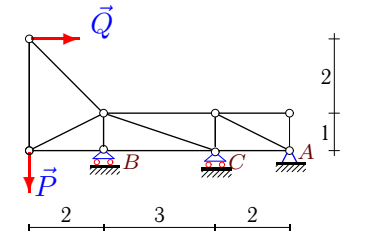
$P = 9$ кН,
$Q = 7$ кН.

Задача М8.29.



$P = 7$ кН,
$Q = 8$ кН.

Задача М8.30.



$P = 9$ кН,
$Q = 5$ кН.

M8 Ответы.

Расчет статически неопределимой фермы

16.06.2012

	δ_{11}	Δ_{1P}	X_A	Y_A	Y_B	Y_C
1	17.285	92.960	-8.000	18.751	-2.373	-5.378
2	26.809	-94.405	-3.000	1.329	0.150	3.521
3	41.045	-68.897	-9.000	-2.593	6.914	1.679
4	13.980	-59.101	-6.000	5.165	1.608	4.227
5	7.711	41.385	7.000	20.747	-6.380	-5.367
6	29.811	96.000	5.000	-2.890	12.110	-3.220
7	30.021	-421.999	-9.000	-3.044	-0.013	14.057
8	113.723	-19.762	-3.000	4.304	4.522	0.174
9	8.052	-48.406	-9.000	0.220	3.769	6.012
10	118.477	-17.533	-4.000	3.489	7.363	0.148
11	42.669	-319.558	-4.000	-0.556	0.067	7.489
12	12.448	-183.711	4.000	-9.568	2.811	14.758
13	5.792	18.084	9.000	24.449	-11.327	-3.122
14	10.596	-110.367	7.000	4.594	-7.010	10.416
15	17.285	183.827	8.000	-4.219	21.854	-10.635
16	13.779	-21.741	5.000	-1.486	7.908	1.578
17	7.711	39.729	4.000	-3.939	15.091	-5.152
18	5.593	29.271	-7.000	3.340	10.894	-5.234
19	21.709	-187.937	5.000	4.669	-6.327	8.657
20	7.385	-3.434	8.000	-6.899	14.434	0.465
21	7.103	-19.858	8.000	6.426	-4.222	2.796
22	12.239	-87.624	-9.000	-0.546	-0.614	7.159
23	36.713	-124.511	-4.000	1.374	4.235	3.391
24	18.257	-34.778	-4.000	5.460	4.635	1.905
25	5.875	3.724	5.000	11.650	-5.016	-0.634
26	11.539	23.033	4.000	9.002	3.995	-1.996
27	5.792	6.733	5.000	-7.303	13.465	-1.162
28	21.709	171.724	-7.000	12.222	4.689	-7.910
29	21.765	-118.591	8.000	-2.780	4.332	5.449
30	16.805	12.155	-5.000	-0.166	9.889	-0.723

M8 файл o8m2A

В первой строке — усилия от действия основной нагрузки, во второй — от единичной вертикальной силы в опоре C.

	U_1	U_2	U_3	V_1	V_2	V_3	V_4	O_1	O_2	O_3	D_1	D_2	D_3
1	0.000	-11.200	-11.200	11.000	-10.167	0.000	0.000	22.677	14.757	0.000	-22.677	-2.951	12.522
	0.000	-1.200	-1.200	0.000	0.000	-1.000	0.000	-0.000	-0.000	0.000	0.000	1.265	1.342
2	3.000	5.778	5.778	-2.111	3.463	0.000	0.000	-4.352	-7.613	-0.000	4.352	1.523	-6.460
	0.000	-1.556	-1.556	0.222	-0.259	-1.000	0.000	0.458	0.468	-0.000	-0.458	1.171	1.739
3	9.000	-0.000	-0.000	3.600	3.000	-9.600	-0.000	2.546	-8.653	0.000	-2.546	8.653	0.000
	0.000	1.500	1.500	-0.600	0.500	1.600	0.000	-0.424	-0.361	0.000	0.424	-1.442	-1.803
4	6.000	6.375	0.000	-6.750	3.375	-4.250	-4.250	-7.547	-6.750	-0.375	7.547	7.662	7.662
	0.000	-0.938	0.000	0.375	-0.188	-0.375	0.625	0.419	0.375	0.938	-0.419	0.676	-1.127
5	-9.000	-9.600	-9.600	0.000	-14.333	0.000	0.000	0.000	16.865	-0.000	12.728	-7.692	13.576
	0.000	-0.600	-0.600	0.000	0.000	-1.000	0.000	0.000	-0.000	-0.000	-0.000	0.721	0.849
6	-22.000	-22.000	-8.500	-5.000	-10.500	-4.500	0.000	7.071	13.500	0.000	24.597	14.230	14.230
	0.000	0.000	-1.500	0.000	0.500	-0.500	0.000	0.000	1.500	0.000	-0.000	-1.581	1.581
7	30.444	30.444	6.778	4.500	11.000	7.889	0.000	-10.062	-15.778	0.000	-31.381	-24.947	-17.640
	-0.889	-0.889	-1.556	0.000	0.000	-0.778	0.000	0.000	1.556	-0.000	0.916	-0.703	1.739
8	7.200	-0.000	-0.000	-0.000	6.600	-4.800	0.000	0.000	-7.589	0.000	-5.940	7.589	0.000
	0.600	3.000	3.000	-0.000	0.800	1.600	0.000	0.000	-0.632	0.000	-0.849	-2.530	-3.162
9	9.000	4.222	0.000	-1.556	1.167	-8.444	-8.444	-1.944	-1.556	4.778	1.603	10.556	9.441
	0.000	-0.389	0.000	0.222	-0.167	-0.222	0.778	0.278	0.222	0.389	-0.229	0.278	-0.870
10	4.000	-0.000	-0.000	-3.400	8.250	-7.600	-0.000	-3.065	-8.061	0.000	1.901	6.008	0.000
	0.000	3.000	3.000	-0.600	0.750	1.600	0.000	-0.541	-0.424	-0.000	0.335	-2.846	-3.162
11	16.625	16.625	8.375	2.667	7.000	4.125	-0.000	-4.807	-12.375	0.000	-17.524	-9.224	-13.044
	-1.125	-1.125	-1.875	0.000	0.000	-0.625	0.000	0.000	1.875	0.000	1.186	-0.839	1.976
12	0.000	19.500	4.000	-6.500	1.500	3.333	-1.500	-19.500	-6.009	-5.000	20.555	-15.284	1.803
	0.000	-0.750	-0.000	0.250	0.250	-0.333	0.750	0.750	0.601	0.500	-0.791	0.264	-0.901
13	0.000	-6.600	-0.000	10.000	-2.500	13.200	13.200	7.906	7.500	-2.400	-10.607	-16.500	-14.758
	0.000	-0.300	-0.000	0.000	-0.000	-0.400	0.600	0.000	0.000	0.300	-0.000	0.500	-0.671
14	-7.000	5.750	0.000	-8.500	-0.500	6.375	0.500	-12.750	-9.369	0.451	15.324	-8.662	-0.451
	0.000	-0.563	-0.000	0.375	0.375	-0.781	0.625	0.563	0.663	0.563	-0.676	0.133	-0.563
15	0.000	-13.200	-13.200	7.000	-18.500	0.000	-0.000	7.425	18.738	0.000	-5.534	8.380	23.702
	0.000	-1.200	-1.200	0.000	0.000	-1.000	0.000	0.000	0.000	0.000	0.000	1.265	1.342
16	3.500	3.500	4.250	-5.000	8.000	-0.500	0.000	7.071	0.750	-0.000	-4.950	0.901	0.901
	-0.375	-0.375	-0.938	0.000	0.000	-0.625	0.000	0.000	0.938	0.000	0.530	-0.676	1.127
17	0.000	-5.000	-5.000	6.000	-7.000	0.000	0.000	6.325	11.180	0.000	-7.211	-1.414	10.817
	0.000	-0.600	-0.600	0.000	0.000	-1.000	0.000	-0.000	-0.000	0.000	0.000	0.849	0.721
18	0.000	-9.000	-9.200	9.000	0.200	0.200	-3.500	9.000	9.200	7.826	-12.728	-0.283	3.966
	0.000	0.000	-0.400	0.000	0.400	-0.600	0.000	-0.000	0.400	-0.000	0.000	-0.566	0.721
19	-5.000	9.286	9.714	-7.143	-0.143	-0.143	5.000	-14.286	-14.714	-7.071	15.972	0.452	-10.861
	0.000	-0.571	-1.429	0.286	0.286	-0.714	-0.000	0.571	1.429	-0.000	-0.639	-0.904	1.597
20	0.000	1.333	8.000	8.000	-5.333	2.222	6.667	7.542	5.333	8.012	-5.963	-9.428	-7.027
	0.000	-0.500	-0.000	0.000	0.000	-0.833	0.500	0.000	0.000	0.601	0.000	0.707	-0.527
21	-2.656	-1.062	0.000	0.000	7.125	0.531	2.125	0.000	-5.344	1.915	-8.906	-2.656	-1.188
	-0.187	-0.375	-0.000	-0.000	-0.250	-0.813	0.750	0.000	0.188	0.676	0.313	0.313	-0.419
22	0.000	-9.000	0.000	3.000	-2.250	-9.000	0.000	3.182	2.250	0.000	-2.372	11.250	0.000
	0.000	0.500	-0.000	-0.333	0.250	1.083	-1.000	-0.354	-0.250	-0.901	0.264	-0.417	0.559
23	0.000	2.200	-4.000	-2.200	6.800	-0.000	-2.667	-2.200	8.000	4.807	3.111	-12.259	4.807
	0.000	0.600	1.500	-0.600	-0.600	1.000	0.000	-0.600	-1.500	0.000	0.849	1.082	-1.803
24	0.000	-4.000	-0.000	-4.000	4.000	-8.000	-0.000	-4.216	-8.433	0.000	4.807	9.615	0.000
	0.000	1.000	1.000	-0.333	0.222	1.333	-0.000	-0.351	-0.351	-0.000	0.401	-0.801	-1.414
25	-5.667	-10.667	0.000	-2.500	-11.333	-1.333	5.333	5.590	4.216	4.000	10.216	9.428	-6.667
	0.000	0.000	0.000	0.000	0.500	-0.125	0.500	0.000	0.395	0.375	0.000	-0.530	-0.625
26	-4.000	-0.000	-0.000	-9.800	2.450	-1.200	0.000	-5.478	-4.900	0.000	8.834	1.500	0.000
	0.000	0.500	-0.000	-0.400	0.100	0.650	-1.000	-0.224	-0.200	-0.559	0.361	-0.500	0.901
27	0.000	1.000	5.000	5.000	-1.250	8.000	8.000	5.154	5.000	-1.000	-6.250	-10.000	-8.944
	0.000	-0.300	-0.000	0.000	0.000	-0.400	0.600	-0.000	-0.000	0.300	0.000	0.500	-0.671
28	0.000	4.857	-14.857	-2.429	6.571	6.571	-10.500	-4.857	14.857	12.619	5.430	-20.781	8.785
	0.000	-0.571	-1.429	0.286	0.286	-0.714	0.000	0.571	1.429	0.000	-0.639	-0.904	1.597
29	11.125	11.125	8.000	-2.667	7.000	0.469	-0.625	8.433	-1.048	-0.938	-11.727	-2.446	1.127
	-1.125	-1.125	0.000	0.000	0.000	-0.469	0.625	0.000	1.048	0.938	1.186	0.210	-1.127
30	-8.000	-8.000	-6.200	5.000	-9.600	-0.600	0.000	-7.071	1.200	0.000	8.944	1.897	1.342
	0.000	0.000	-1.200	0.000	0.400	-0.600	0.000	0.000	1.200	0.000	-0.000	-1.265	1.342