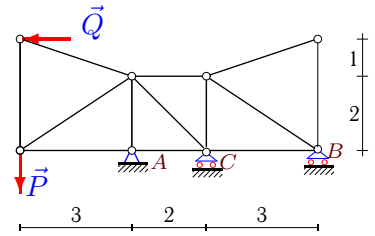
Расчет статически неопределимой фермы

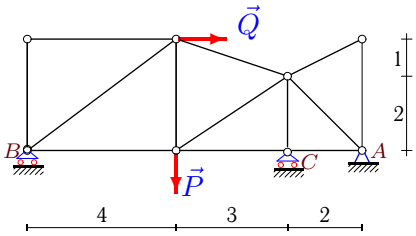
Найти реакции опор фермы.

Задача М8.1.



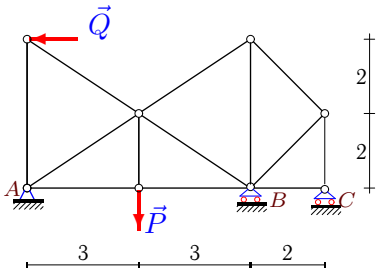
$P = 9$ кН,
$Q = 6$ кН.

Задача М8.2.



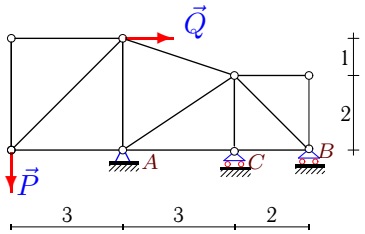
$P = 8$ кН,
$Q = 9$ кН.

Задача М8.3.



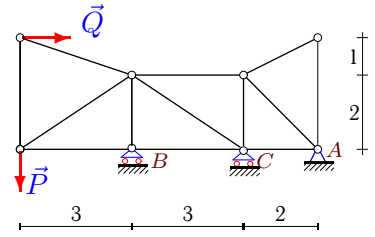
$P = 13$ кН,
$Q = 7$ кН.

Задача М8.4.



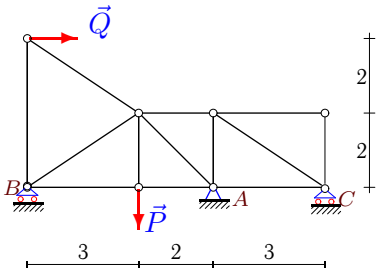
$P = 13$ кН,
$Q = 7$ кН.

Задача М8.5.



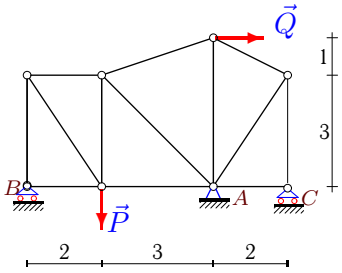
$P = 13$ кН,
$Q = 8$ кН.

Задача М8.6.



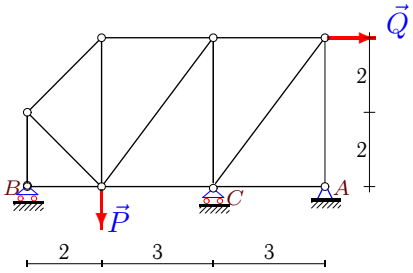
$P = 7$ кН,
$Q = 6$ кН.

Задача М8.7.



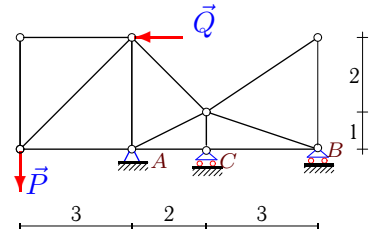
$P = 12$ кН,
$Q = 7$ кН.

Задача М8.8.



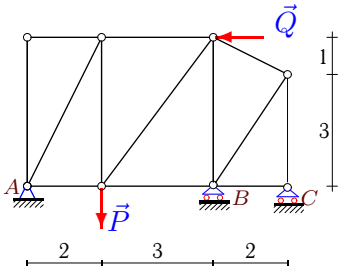
$P = 13$ кН,
$Q = 3$ кН.

Задача М8.9.



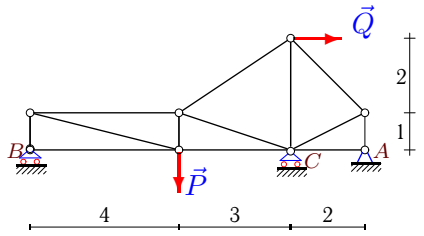
$P = 8$ кН,
$Q = 8$ кН.

Задача М8.10.



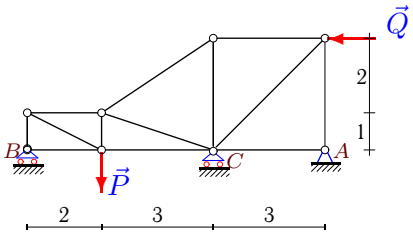
$P = 11$ кН,
$Q = 4$ кН.

Задача М8.11.



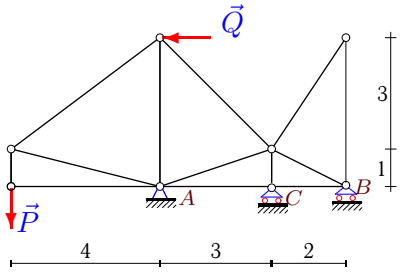
$P = 5$ кН,
$Q = 9$ кН.

Задача М8.12.



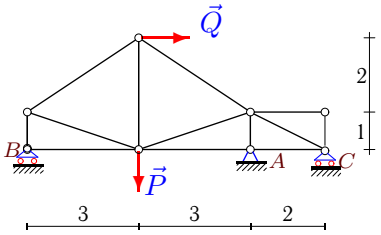
$P = 9$ кН,
$Q = 3$ кН.

Задача М8.13.



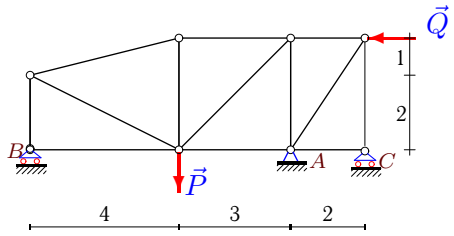
$P = 11$ кН,
$Q = 5$ кН.

Задача М8.14.



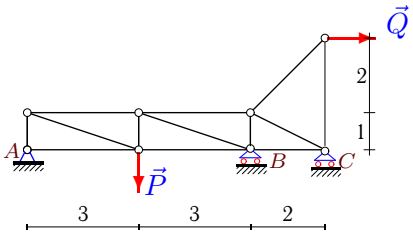
$P = 10$ кН,
$Q = 8$ кН.

Задача М8.15.



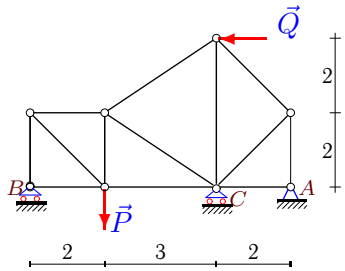
$P = 12$ кН,
$Q = 3$ кН.

Задача М8.16.



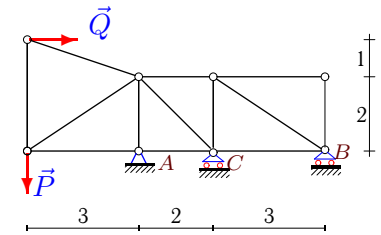
$P = 11$ кН,
$Q = 6$ кН.

Задача М8.17.



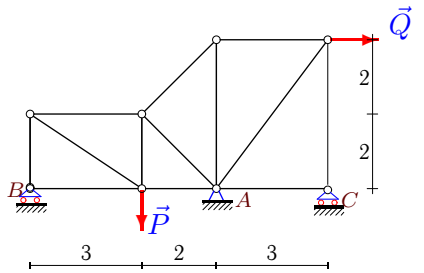
$P = 6$ кН,
$Q = 7$ кН.

Задача М8.18.



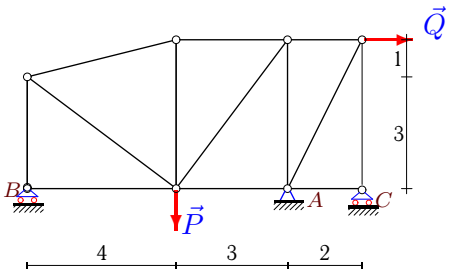
$P = 6$ кН,
$Q = 4$ кН.

Задача М8.19.



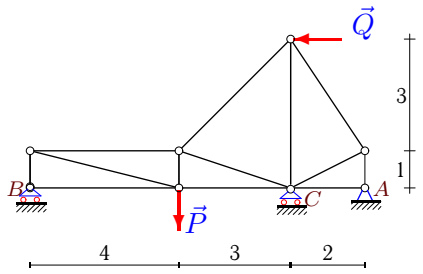
$P = 7$ кН,
$Q = 3$ кН.

Задача М8.20.



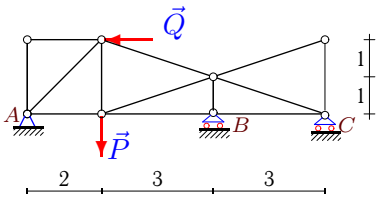
$P = 9$ кН,
$Q = 4$ кН.

Задача М8.21.



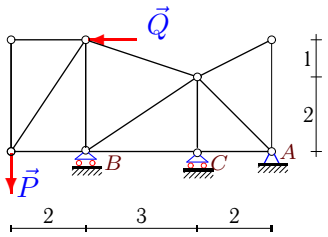
$P = 8$ кН,
$Q = 9$ кН.

Задача М8.22.



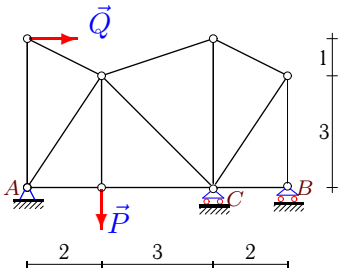
$P = 6$ кН,
$Q = 3$ кН.

Задача М8.23.



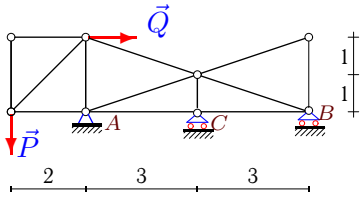
$P = 10$ кН,
$Q = 9$ кН.

Задача М8.24.



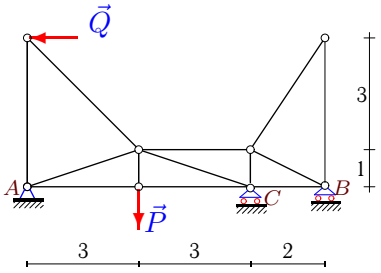
$P = 12$ кН,
$Q = 5$ кН.

Задача М8.25.



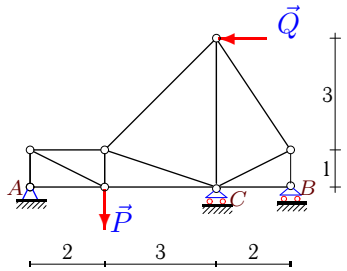
$P = 11$ кН,
$Q = 3$ кН.

Задача М8.26.



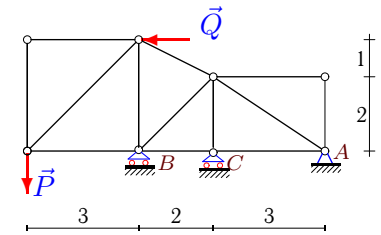
$P = 10$ кН,
$Q = 9$ кН.

Задача М8.27.



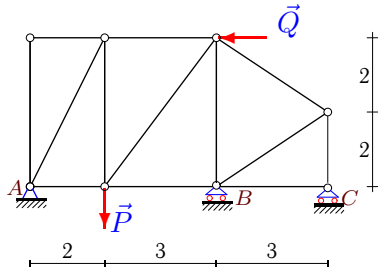
$P = 6$ кН,
$Q = 4$ кН.

Задача М8.28.



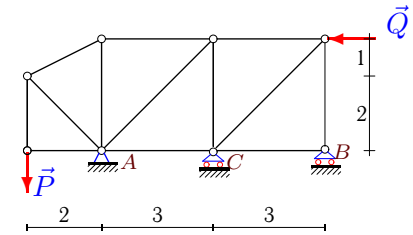
$P = 9$ кН,
$Q = 8$ кН.

Задача М8.29.



$P = 10$ кН,
$Q = 6$ кН.

Задача М8.30.



$P = 10$ кН,
$Q = 9$ кН.

M8 Ответы.

Расчет статически неопределимой фермы

16.06.2012

	δ_{11}	Δ_{1P}	X_A	Y_A	Y_B	Y_C
1	6.751	37.738	6.000	21.354	-6.764	-5.590
2	11.309	-31.391	-9.000	4.397	0.828	2.776
3	11.710	33.639	7.000	10.209	5.664	-2.873
4	7.711	15.519	-7.000	17.405	-2.392	-2.013
5	6.751	5.521	-8.000	-2.509	16.327	-0.818
6	35.273	-2.985	-6.000	8.865	-1.949	0.085
7	10.812	-37.962	-7.000	5.484	3.004	3.511
8	8.519	-35.961	-3.000	2.112	6.667	4.221
9	17.285	337.164	8.000	29.304	-1.797	-19.507
10	12.053	34.023	4.000	8.671	5.152	-2.823
11	16.091	0.273	-9.000	5.235	-0.218	-0.017
12	12.934	-132.391	3.000	-5.272	4.037	10.236
13	17.285	279.942	5.000	30.278	-3.082	-16.196
14	44.970	-84.951	-8.000	6.481	1.630	1.889
15	13.441	38.357	3.000	9.241	5.613	-2.854
16	45.430	-225.328	-6.000	4.153	1.887	4.960
17	5.768	-39.953	7.000	-7.233	6.307	6.927
18	6.751	-0.728	-4.000	7.135	-1.243	0.108
19	28.768	-27.351	-3.000	5.079	0.970	0.951
20	13.310	-26.791	-4.000	4.841	2.147	2.013
21	17.833	-447.806	9.000	-19.975	2.864	25.111
22	113.723	13.788	3.000	4.727	1.394	-0.121
23	7.711	13.523	9.000	-8.348	20.101	-1.754
24	5.027	-48.651	-5.000	2.949	-0.628	9.679
25	30.311	114.164	-3.000	15.550	-0.783	-3.766
26	25.429	15.212	9.000	10.900	-0.301	-0.598
27	9.502	-81.927	4.000	4.108	-6.730	8.622
28	7.711	63.940	8.000	-6.883	24.175	-8.292
29	21.101	73.914	6.000	8.698	4.804	-3.503
30	7.243	10.000	9.000	18.524	-7.143	-1.381

M8 файл o8m1A

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	-16.500 0.000	-22.500 0.000	-13.500 -0.600	-2.000 0.000	-18.000 0.600	-9.000 -0.400	0.000 0.000	6.325 0.000	13.500 0.600	0.000 0.000	19.831 -0.000	12.728 -0.849	16.225 0.721
2	1.926 -0.296	-2.444 -0.778	-2.444 -0.778	-0.000 -0.000	5.086 -0.321	0.000 -1.000	-0.000 0.000	0.000 0.000	-11.517 0.312	0.000 0.000	-2.407 0.370	5.253 0.579	-9.271 1.100
3	2.750 0.500	2.750 0.500	-0.000 -0.000	-4.667 0.000	13.000 0.000	-0.000 0.833	0.000 -1.000	8.413 0.000	0.000 -0.601	0.000 -0.707	-11.718 -0.601	-3.305 0.000	0.000 0.707
4	-13.000 0.000	-3.600 -0.600	-3.600 -0.600	-0.000 0.000	-15.000 0.000	0.000 -1.000	0.000 0.000	0.000 0.000	6.325 -0.000	0.000 -0.000	18.385 -0.000	-2.884 0.721	5.091 0.849
5	-15.500 -0.000	-15.500 -0.000	-11.000 -0.600	2.667 -0.000	-16.000 0.400	-3.000 -0.600	-0.000 0.000	-8.433 0.000	3.000 0.600	-0.000 -0.000	18.629 0.000	5.408 -0.721	4.243 0.849
6	3.000 0.900	3.000 0.900	0.000 1.500	4.000 0.000	7.000 0.000	-0.000 1.000	-0.000 0.000	-7.211 0.000	0.000 -1.500	-0.000 -0.000	-3.606 -1.082	-12.728 0.849	0.000 -1.803
7	0.000 0.000	1.067 0.267	0.000 -0.000	-1.600 -0.400	10.400 -0.400	-2.333 0.417	0.000 -1.000	-1.067 -0.267	7.379 -0.527	0.000 -0.559	1.923 0.481	-11.408 0.330	0.000 0.901
8	0.000 0.000	0.562 -0.469	-3.000 -0.000	-8.250 0.375	4.125 -0.188	-4.750 -0.375	-4.750 0.625	-5.834 0.265	-4.125 0.188	-0.562 0.469	5.834 -0.265	5.938 0.469	5.938 -0.781
9	-8.000 -0.000	-28.800 -1.200	-28.800 -1.200	0.000 -0.000	-24.000 -0.000	0.000 -1.000	-0.000 -0.000	0.000 0.000	22.627 0.000	0.000 0.000	11.314 0.000	14.311 1.342	30.358 1.265
10	0.900 0.200	0.000 0.500	0.000 -0.000	-0.000 0.000	9.800 0.400	-1.200 0.650	0.000 -1.000	0.000 0.000	-4.900 -0.200	0.000 -0.559	-10.957 -0.447	1.500 -0.500	0.000 0.901
11	0.000 0.000	-0.889 -0.889	-9.000 0.000	0.222 0.222	5.222 0.222	-0.198 -0.864	-5.222 0.778	0.889 0.889	6.632 0.623	-4.924 0.733	-0.916 -0.916	-4.880 0.390	3.892 -0.580
12	0.000 0.000	15.750 -0.750	3.000 -0.000	-7.875 0.375	1.125 0.375	2.750 -0.417	-1.125 0.625	-15.750 0.750	-4.958 0.751	-4.125 0.625	17.609 -0.839	-12.254 0.132	1.591 -0.884
13	0.000 0.000	-25.600 -1.200	-25.600 -1.200	11.000 0.000	-24.250 -0.000	0.000 -1.000	0.000 0.000	13.750 0.000	22.627 0.000	-0.000 0.000	-11.339 -0.000	10.119 1.265	28.622 1.342
14	0.000 0.000	-8.000 2.000	0.000 2.000	-1.000 -0.333	6.667 0.444	-9.000 1.333	0.000 0.000	-1.202 -0.401	-10.817 -0.401	-0.000 0.000	1.054 0.351	9.487 -1.757	0.000 -2.236
15	0.000 0.000	3.000 0.667	0.000 0.000	-6.429 -0.286	2.143 0.095	-5.571 0.286	0.000 -1.000	-8.835 -0.393	-8.571 -0.381	-3.000 -0.667	9.583 0.426	7.879 -0.404	0.000 1.202
16	6.000 0.000	13.500 1.000	-12.000 2.000	-2.500 -0.333	8.500 -0.333	0.000 1.000	-6.000 0.000	-7.500 -1.000	18.000 -2.000	8.485 -0.000	7.906 1.054	-26.879 1.054	13.416 -2.236
17	0.000 0.000	8.286 -0.286	7.000 0.000	-8.286 0.286	-2.286 0.286	2.762 -0.595	2.286 0.714	-8.286 0.286	-7.039 0.429	1.616 0.505	11.718 -0.404	-2.919 -0.086	-1.616 -0.505
18	-7.000 0.000	-3.000 0.000	-1.800 -0.600	1.333 0.000	-7.200 0.600	-1.200 -0.400	0.000 0.000	-4.216 0.000	1.800 0.600	0.000 0.000	8.413 -0.000	1.697 -0.849	2.163 0.721
19	0.000 0.000	0.600 0.900	0.000 0.000	-0.400 -0.600	6.600 -0.600	-3.000 0.750	0.000 -1.000	-0.600 -0.900	4.243 -1.061	3.000 -0.750	0.721 1.082	-5.091 -0.212	-0.000 1.250
20	0.000 0.000	-4.000 0.500	0.000 -0.000	-1.571 -0.286	0.393 0.071	-7.429 0.286	0.000 -1.000	-1.620 -0.295	-1.571 -0.286	4.000 -0.500	1.964 0.357	9.286 -0.357	-0.000 1.118
21	0.000 0.000	33.778 -0.889	9.000 0.000	-8.444 0.222	-0.444 0.222	8.444 -0.972	0.444 0.778	-33.778 0.889	-12.414 0.550	0.401 0.701	34.817 -0.916	-26.352 0.527	-0.248 -0.435
22	1.800 0.600	-0.000 3.000	-0.000 3.000	-0.000 -0.000	5.400 0.800	-1.200 1.600	0.000 0.000	0.000 0.000	-1.897 -0.632	0.000 0.000	-6.788 -0.849	1.897 -2.530	-0.000 -3.162
23	-6.667 0.000	-0.400 -0.600	-0.400 -0.600	-0.000 0.000	-15.222 0.000	0.000 -1.000	0.000 0.000	0.000 0.000	16.514 -0.000	0.000 -0.000	12.019 -0.000	-7.532 0.721	13.294 0.849
24	10.476 -0.190	10.476 -0.190	-0.000 0.000	2.500 0.000	12.000 0.000	2.619 -0.298	-6.286 0.714	-5.590 0.000	-3.313 0.376	-3.514 0.399	-9.872 0.343	-10.371 -0.236	5.666 -0.644
25	-11.000 -0.000	-8.000 -1.500	-8.000 -1.500	0.000 -0.000	-13.667 -0.000	0.000 -1.000	0.000 0.000	0.000 0.000	8.433 0.000	0.000 0.000	15.556 0.000	0.000 1.581	8.433 1.581
26	-3.750 -0.750	-3.750 -0.750	-1.500 -1.500	-9.000 0.000	10.000 0.000	-0.750 -0.750	0.000 0.000	12.728 0.000	1.500 1.500	-0.000 0.000	-5.534 0.791	2.372 -0.791	1.677 1.677
27	-4.000 -0.000	9.143 -0.571	0.000 -0.000	-6.571 0.286	-0.571 0.286	3.286 -0.893	0.571 0.714	-13.143 0.571	-5.253 0.505	0.515 0.644	14.694 -0.639	-9.939 0.226	-0.319 -0.399
28	-9.000 0.000	-7.300 -0.600	-7.300 -0.600	-0.000 0.000	-17.500 0.000	0.000 -1.000	0.000 0.000	0.000 0.000	19.007 -0.000	0.000 -0.000	12.728 -0.000	-2.404 0.849	18.388 0.721
29	-0.600 0.300	0.000 0.750	0.000 0.000	0.000 0.000	10.800 0.600	0.800 1.100	0.000 -1.000	0.000 0.000	-5.400 -0.300	0.000 -0.901	-12.075 -0.671	-1.000 -0.750	0.000 0.901
30	0.000 0.000	-7.833 -0.500	-0.000 0.000	10.000 0.000	-3.333 0.000	7.833 -0.500	7.833 0.500	7.454 -0.000	6.667 -0.000	-1.167 0.500	-9.428 0.000	-11.078 0.707	-11.078 -0.707