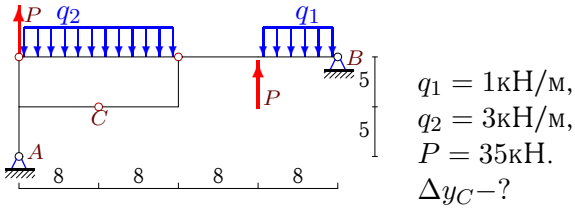


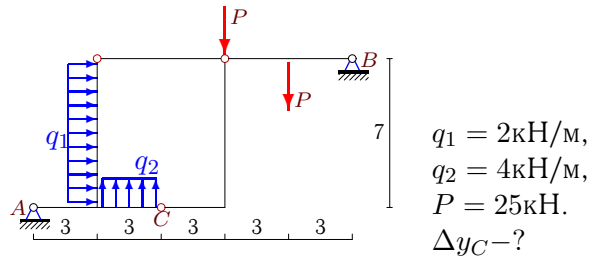
Статически определимая рама

Построить эпюры M , Q , N в раме. Найти горизонтальное (Δx_C) или вертикальное (Δy_C) смещение шарнира C . Все стержни имеют одинаковую жесткость EJ .

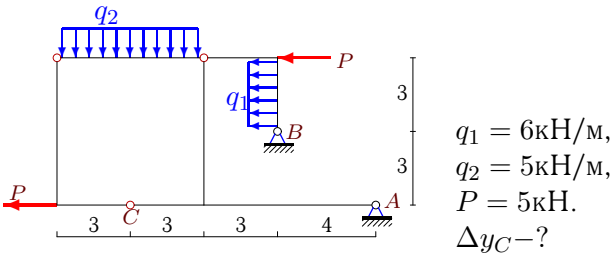
Задача 21.1.



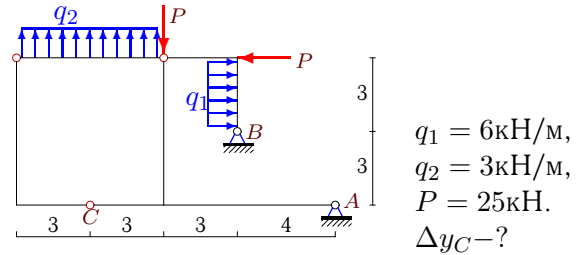
Задача 21.2.



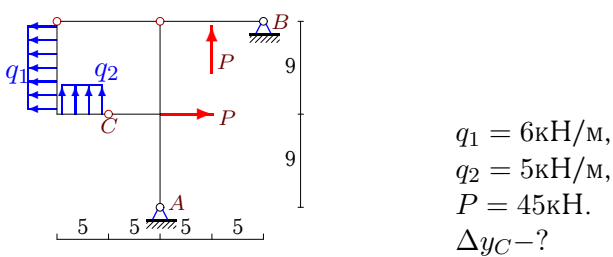
Задача 21.3.



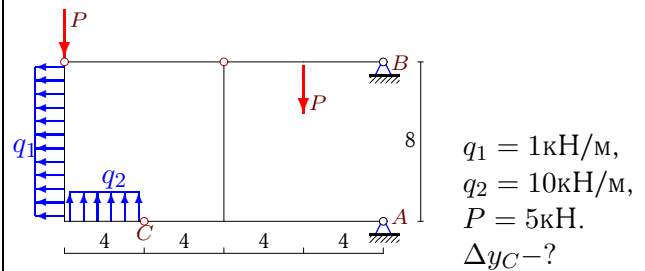
Задача 21.4.



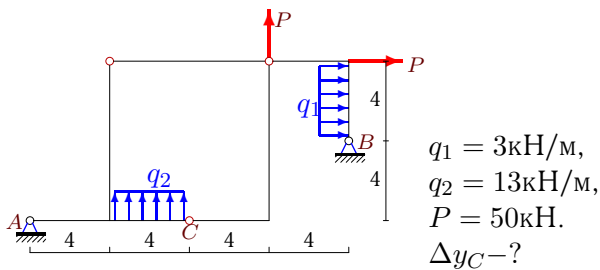
Задача 21.5.



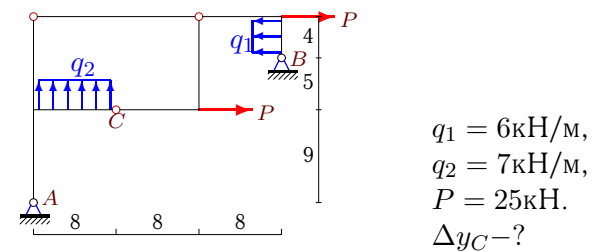
Задача 21.6.



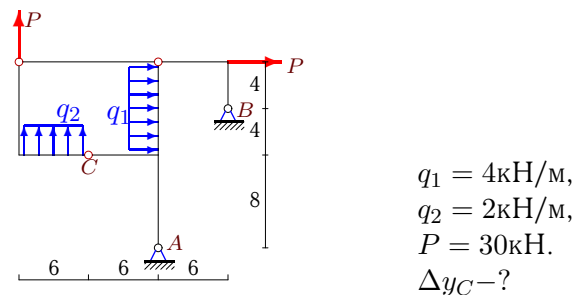
Задача 21.7.



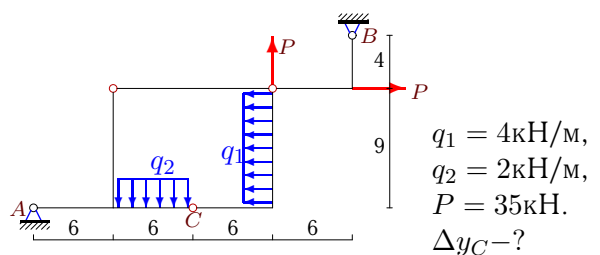
Задача 21.8.



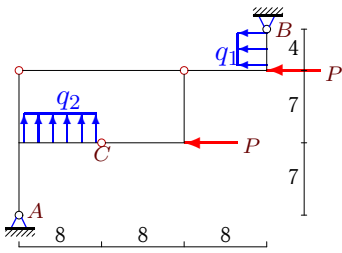
Задача 21.9.



Задача 21.10.

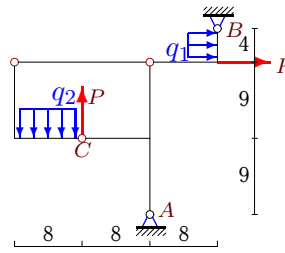


Задача 21.11.



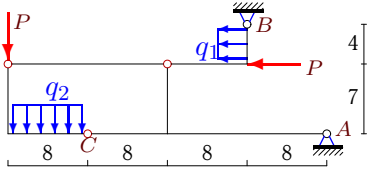
$q_1 = 4 \text{ кН/м},$
 $q_2 = 7 \text{ кН/м},$
 $P = 20 \text{ кН}.$
 $\Delta x_C = ?$

Задача 21.12.



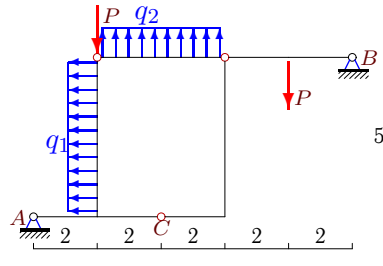
$q_1 = 1 \text{ кН/м},$
 $q_2 = 4 \text{ кН/м},$
 $P = 35 \text{ кН}.$
 $\Delta y_C = ?$

Задача 21.13.



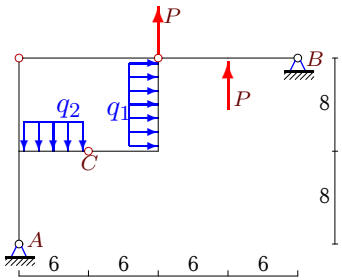
$q_1 = 3 \text{ кН/м},$
 $q_2 = 6 \text{ кН/м},$
 $P = 5 \text{ кН}.$
 $\Delta y_C = ?$

Задача 21.14.



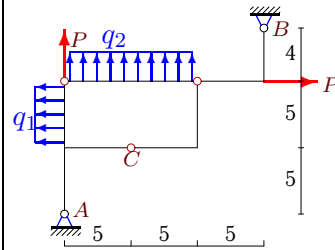
$q_1 = 2 \text{ кН/м},$
 $q_2 = 8 \text{ кН/м},$
 $P = 10 \text{ кН}.$
 $\Delta y_C = ?$

Задача 21.15.



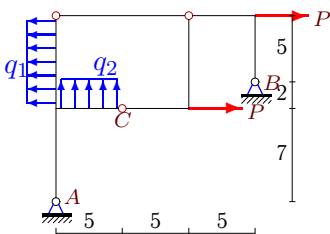
$q_1 = 5 \text{ кН/м},$
 $q_2 = 6 \text{ кН/м},$
 $P = 50 \text{ кН}.$
 $\Delta y_C = ?$

Задача 21.16.



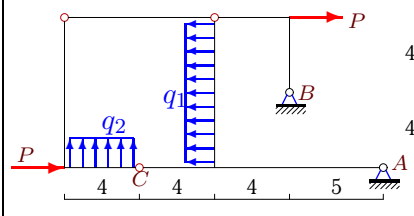
$q_1 = 3 \text{ кН/м},$
 $q_2 = 6 \text{ кН/м},$
 $P = 20 \text{ кН}.$
 $\Delta y_C = ?$

Задача 21.17.



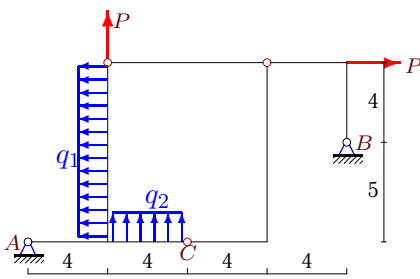
$q_1 = 5 \text{ кН/м},$
 $q_2 = 11 \text{ кН/м},$
 $P = 65 \text{ кН}.$
 $\Delta y_C = ?$

Задача 21.18.



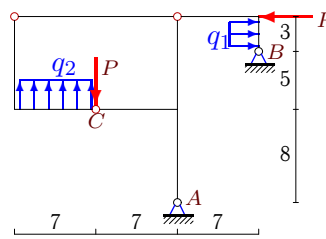
$q_1 = 5 \text{ кН/м},$
 $q_2 = 1 \text{ кН/м},$
 $P = 30 \text{ кН}.$
 $\Delta y_C = ?$

Задача 21.19.



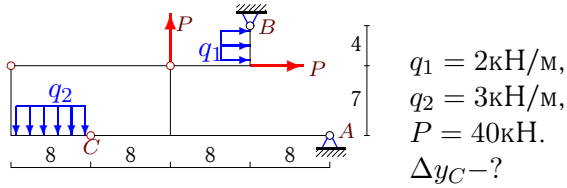
$q_1 = 2 \text{ кН/м},$
 $q_2 = 6 \text{ кН/м},$
 $P = 15 \text{ кН}.$
 $\Delta y_C = ?$

Задача 21.20.

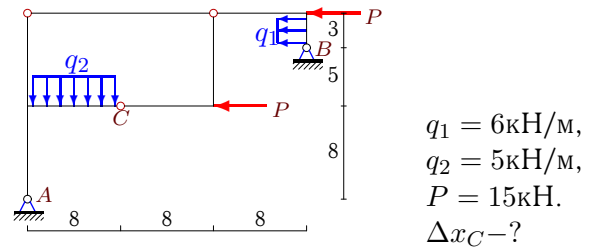


$q_1 = 1 \text{ кН/м},$
 $q_2 = 3 \text{ кН/м},$
 $P = 25 \text{ кН}.$
 $\Delta x_C = ?$

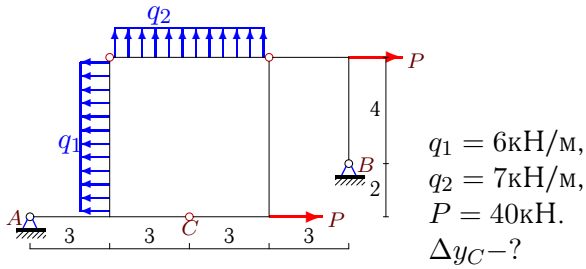
Задача 21.21.



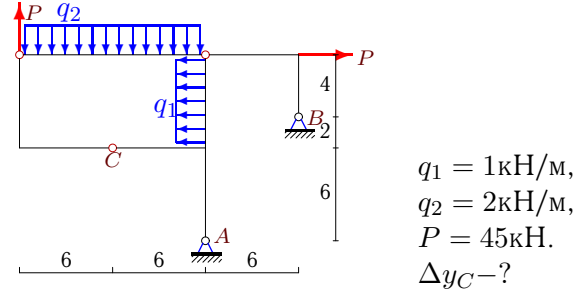
Задача 21.22.



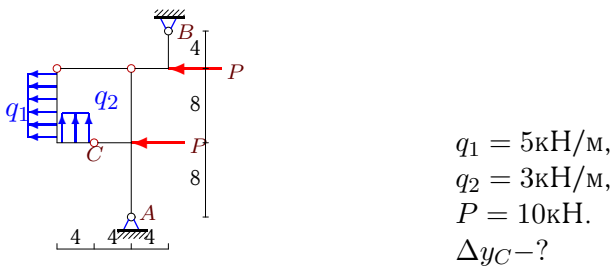
Задача 21.23.



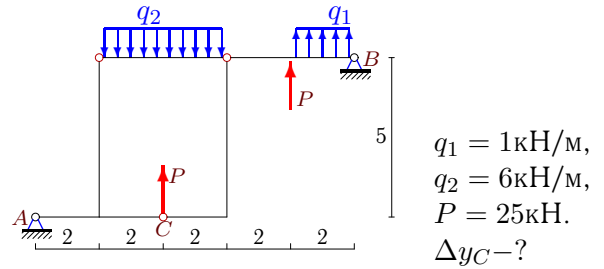
Задача 21.24.



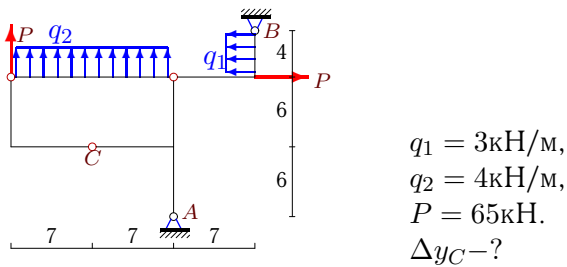
Задача 21.25.



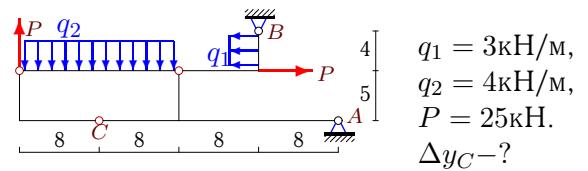
Задача 21.26.



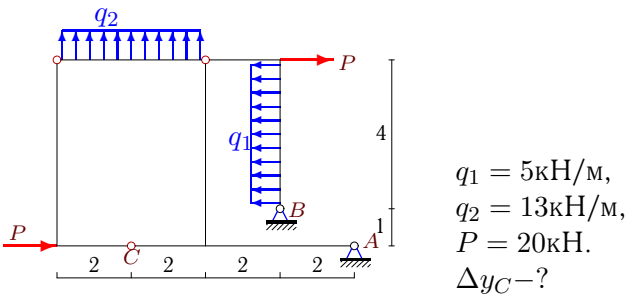
Задача 21.27.



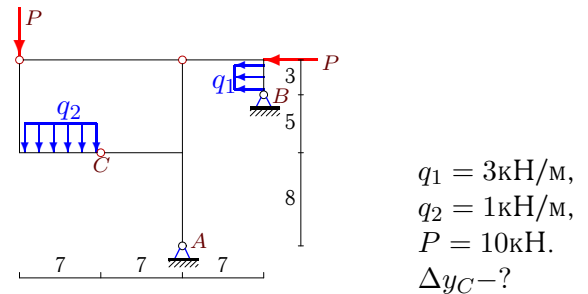
Задача 21.28.



Задача 21.29.



Задача 21.30.



Статически определимая рама

№	X_A	X_B	Y_A	Y_B	x_A	x_B	y_A	y_B	$EJ\Delta \cdot 10^{-3}$
1	13.600	-13.600	-2.500	-11.500	-0.800	0.800	-1.000	0.000	-1.904
2	33.500	-47.500	25.500	12.500	-0.857	0.857	-1.000	0.000	-2.749
3	403.000	-375.000	-354.000	384.000	-10.000	10.000	9.000	-10.000	-725.278
4	107.000	-100.000	-84.000	91.000	-10.000	10.000	9.000	-10.000	-176.737
5	1.417	7.583	-47.500	-22.500	0.278	-0.278	-1.000	0.000	1.979
6	61.500	-53.500	-32.500	2.500	1.500	-1.500	-1.000	0.000	19.093
7	-79.200	17.200	-78.800	-23.200	-0.400	0.400	-0.600	-0.400	8.036
8	-28.962	2.962	-60.519	4.519	-0.308	0.308	-0.846	-0.154	5.434
9	21.250	-83.250	-97.500	55.500	0.375	-0.375	-1.250	0.250	6.449
10	124.000	-123.000	59.000	-82.000	4.000	-4.000	1.667	-2.667	104.324
11	-78.000	134.000	-119.000	63.000	0.167	-1.167	0.583	-0.583	-32.454
12	-5.778	-33.222	12.611	-15.611	0.444	-0.444	-0.778	-0.222	1.683
13	-94.400	111.400	0.300	52.700	1.600	-1.600	-0.200	-0.800	-31.075
14	-10.600	20.600	-17.000	5.000	-0.800	0.800	-1.000	0.000	0.406
15	-59.500	19.500	-39.000	-25.000	-0.375	0.375	-1.000	0.000	7.164
16	-111.250	106.250	-165.000	85.000	-2.500	2.500	-3.000	2.000	57.919
17	-59.167	-35.833	-90.833	35.833	-0.208	0.208	-0.792	-0.208	1.156
18	-160.000	140.000	136.000	-140.000	-13.000	13.000	12.000	-13.000	798.240
19	-4.143	7.143	-31.857	-7.143	-0.381	0.381	-0.619	-0.381	2.631
20	2.844	19.156	12.853	-8.853	-0.500	-0.500	-0.214	0.214	-1.092
21	-25.600	-22.400	-6.800	-9.200	1.600	-1.600	-0.200	-0.800	-2.563
22	23.364	24.636	45.864	-5.864	-0.636	-0.364	-0.136	0.136	-3.278
23	-50.667	6.667	-33.111	-8.889	-0.333	0.333	-0.556	-0.444	0.888
24	34.500	-73.500	-70.000	49.000	0.500	-0.500	-1.333	0.333	5.551
25	19.500	40.500	-52.500	40.500	0.250	-0.250	-0.750	-0.250	0.080
26	-16.400	16.400	-14.000	-14.000	-0.800	0.800	-1.000	0.000	0.640
27	108.500	-161.500	-25.286	-95.714	0.583	-0.583	-0.667	-0.333	20.941
28	-68.308	55.308	14.346	24.654	1.846	-1.846	-0.077	-0.923	-12.861
29	-150.667	130.667	189.333	-241.333	-2.000	2.000	3.000	-4.000	31.772
30	-13.344	32.344	28.933	-11.933	0.438	-0.438	-1.188	0.188	-3.424

№	1	2	3	4	5	6	7	8
1	0.000	0.000	0.000	0.000	0.000	-1.451	0.000	-0.453
2	0.000	0.000	0.000	-2.394	0.000	-0.283	0.000	-0.229
3	0.000	-34.560	-34.560	0.000	-291.960	0.000	-0.135	-364.266
4	0.000	-8.190	-8.190	0.000	-73.800	0.000	0.081	-86.436
5	0.000	0.000	0.000	0.000	0.842	0.000	1.042	0.096
6	0.000	0.000	0.000	0.000	12.800	0.000	0.747	5.547
7	0.000	0.198	0.198	6.738	-0.457	0.676	-0.229	1.009
8	0.000	-0.119	-0.059	-0.006	-0.133	4.696	-0.119	2.165
9	0.000	0.999	0.666	-0.000	0.656	-0.000	3.024	1.360
10	0.000	15.744	10.496	40.320	13.536	6.360	9.024	7.080
11	0.000	-6.272	-3.136	-1.486	-5.488	-9.060	-6.272	-1.486
12	0.000	0.592	0.296	0.000	0.912	0.000	0.512	-0.624
13	0.000	-7.195	-3.598	0.000	-11.206	0.000	-9.045	-0.082
14	0.000	0.000	0.000	0.373	0.000	0.029	0.000	0.045
15	0.000	0.000	0.000	-1.072	0.000	4.104	0.000	3.808
16	0.000	7.083	5.667	0.078	9.583	14.375	9.583	11.589
17	0.000	-0.311	-0.311	-0.569	-0.435	2.089	-0.311	1.409
18	0.000	38.827	38.827	0.000	335.019	0.000	0.085	396.576
19	0.000	0.058	0.058	2.182	0.131	0.064	0.058	0.421
20	0.000	-0.217	-0.093	0.000	-0.541	0.000	0.000	-0.243
21	0.000	1.256	0.628	0.000	-2.174	0.000	-4.096	1.857
22	0.000	-0.136	-0.051	0.213	-0.136	-0.602	-0.136	-2.537
23	0.000	0.036	0.047	0.904	-0.097	0.061	-0.048	0.166
24	0.000	1.176	0.784	0.000	-0.054	0.000	2.376	1.242
25	0.000	-0.216	-0.216	0.000	-0.576	0.000	0.256	0.832
26	0.000	0.000	0.000	0.533	0.000	0.069	0.000	0.037
27	0.000	3.648	2.084	0.000	0.000	0.000	10.633	4.557
28	0.000	-3.884	-1.942	0.000	-4.393	0.000	-1.195	-1.507
29	0.000	2.574	5.148	-0.000	11.756	-0.000	0.069	12.117
30	0.000	-0.256	-0.110	-0.000	-0.114	-0.000	-1.944	-0.996