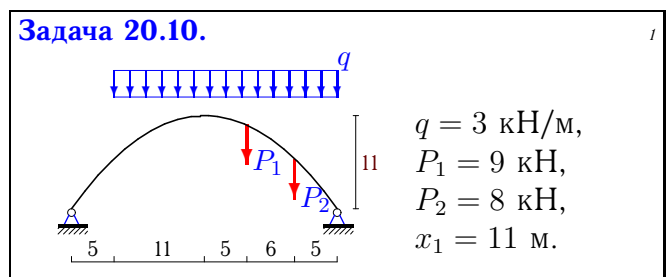
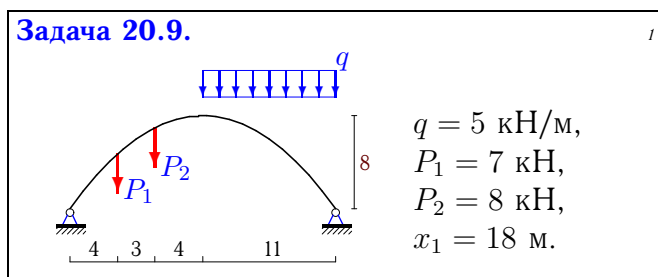
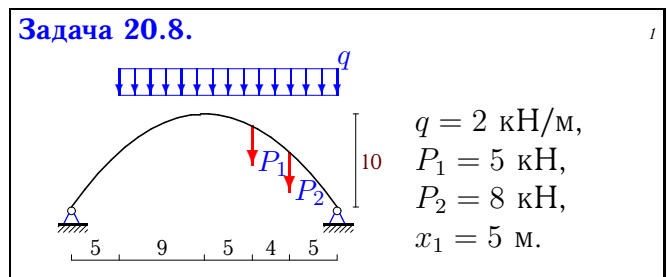
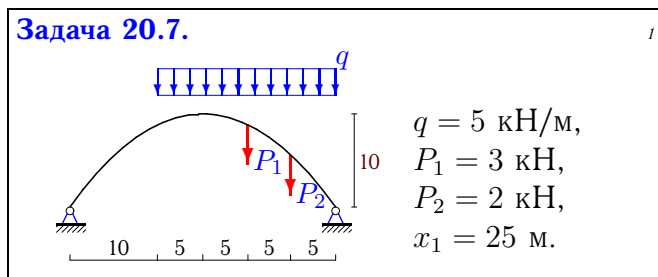
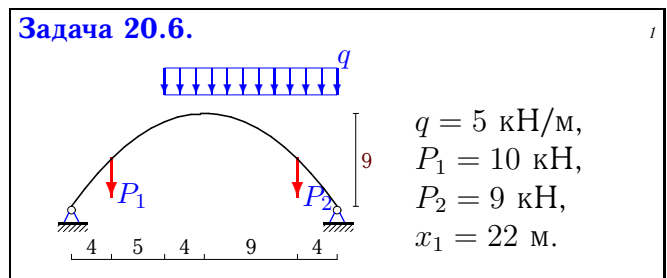
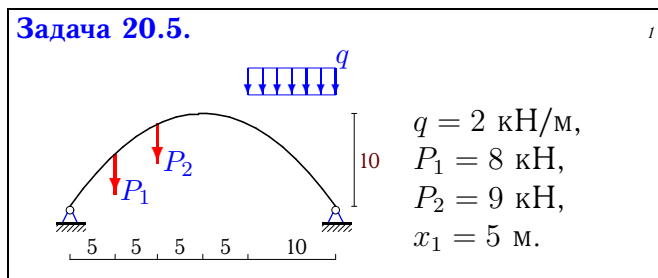
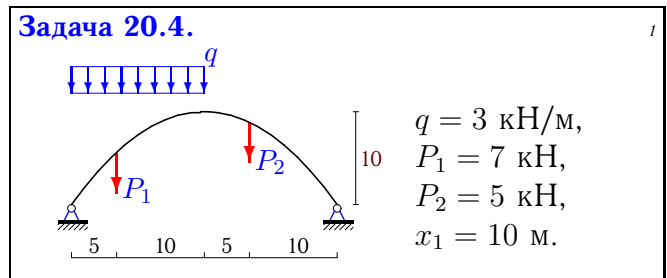
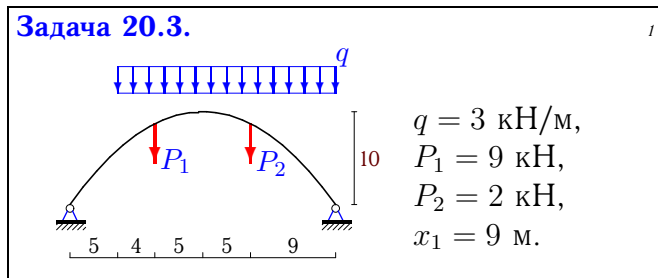
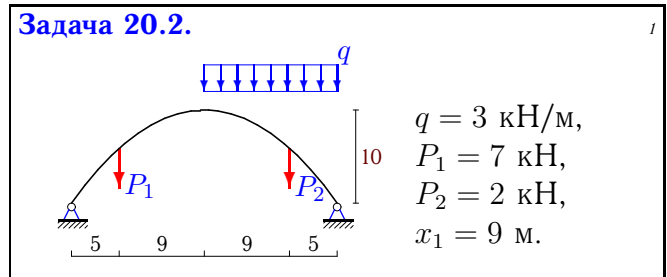
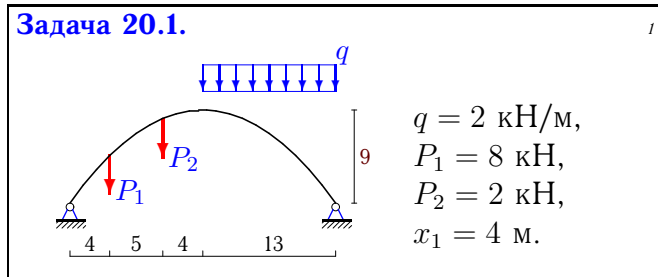
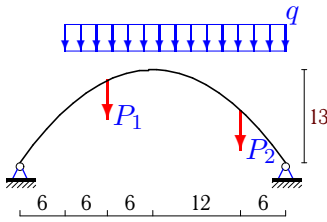


Двухшарнирная арка

Построить эпюры M , Q , N в двухшарнирной арке параболической формы. Для заданного сечения x_1 вычислить значения $M(x_1)$, $Q(x_1)$, $N(x_1)$. Начало координат находится на левой опоре арки. Сечение арки прямоугольное с высотой $h = 0.6\text{ м}$.

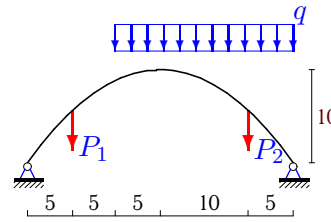


Задача 20.11.



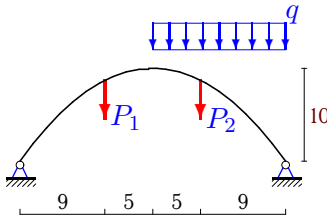
$q = 3 \text{ кН/м,}$
 $P_1 = 7 \text{ кН,}$
 $P_2 = 5 \text{ кН,}$
 $x_1 = 12 \text{ м.}$

Задача 20.12.



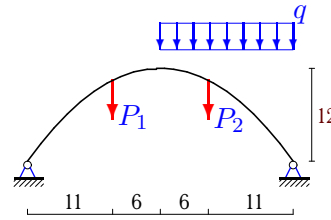
$q = 4 \text{ кН/м,}$
 $P_1 = 4 \text{ кН,}$
 $P_2 = 9 \text{ кН,}$
 $x_1 = 20 \text{ м.}$

Задача 20.13.



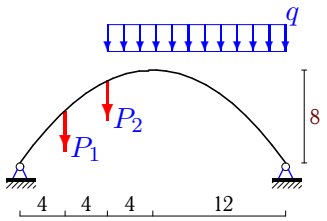
$q = 2 \text{ кН/м,}$
 $P_1 = 9 \text{ кН,}$
 $P_2 = 10 \text{ кН,}$
 $x_1 = 5 \text{ м.}$

Задача 20.14.



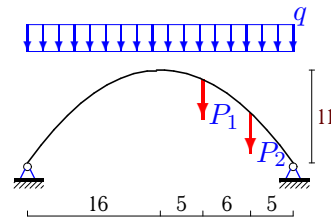
$q = 5 \text{ кН/м,}$
 $P_1 = 10 \text{ кН,}$
 $P_2 = 5 \text{ кН,}$
 $x_1 = 28 \text{ м.}$

Задача 20.15.



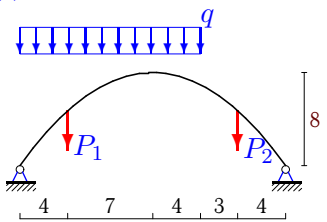
$q = 3 \text{ кН/м,}$
 $P_1 = 4 \text{ кН,}$
 $P_2 = 9 \text{ кН,}$
 $x_1 = 8 \text{ м.}$

Задача 20.16.



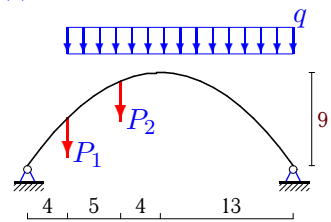
$q = 2 \text{ кН/м,}$
 $P_1 = 2 \text{ кН,}$
 $P_2 = 7 \text{ кН,}$
 $x_1 = 5 \text{ м.}$

Задача 20.17.



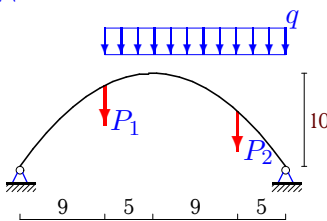
$q = 3 \text{ кН/м,}$
 $P_1 = 5 \text{ кН,}$
 $P_2 = 4 \text{ кН,}$
 $x_1 = 7 \text{ м.}$

Задача 20.18.



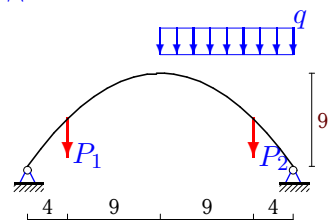
$q = 2 \text{ кН/м,}$
 $P_1 = 3 \text{ кН,}$
 $P_2 = 2 \text{ кН,}$
 $x_1 = 4 \text{ м.}$

Задача 20.19.



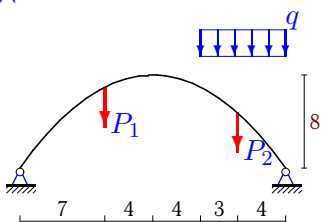
$q = 5 \text{ кН/м,}$
 $P_1 = 9 \text{ кН,}$
 $P_2 = 7 \text{ кН,}$
 $x_1 = 23 \text{ м.}$

Задача 20.20.



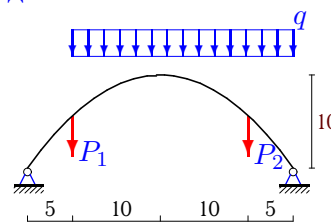
$q = 3 \text{ кН/м,}$
 $P_1 = 2 \text{ кН,}$
 $P_2 = 7 \text{ кН,}$
 $x_1 = 9 \text{ м.}$

Задача 20.21.



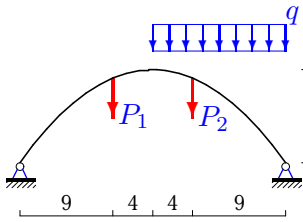
$q = 5 \text{ кН/м,}$
 $P_1 = 3 \text{ кН,}$
 $P_2 = 6 \text{ кН,}$
 $x_1 = 18 \text{ м.}$

Задача 20.22.



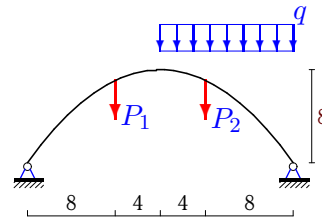
$q = 5 \text{ кН/м,}$
 $P_1 = 4 \text{ кН,}$
 $P_2 = 8 \text{ кН,}$
 $x_1 = 25 \text{ м.}$

Задача 20.23.



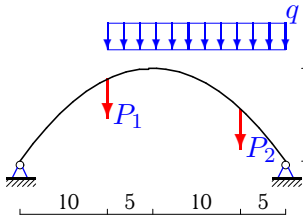
$q = 2 \text{ кН/м},$
 $P_1 = 7 \text{ кН},$
 $P_2 = 2 \text{ кН},$
 $x_1 = 4 \text{ м}.$

Задача 20.24.



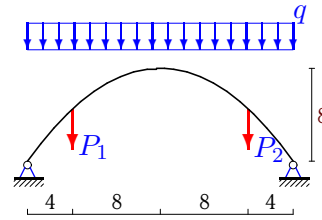
$q = 2 \text{ кН/м},$
 $P_1 = 5 \text{ кН},$
 $P_2 = 10 \text{ кН},$
 $x_1 = 4 \text{ м}.$

Задача 20.25.



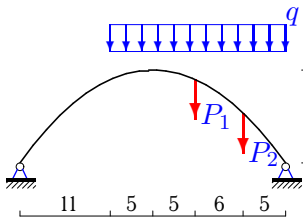
$q = 2 \text{ кН/м},$
 $P_1 = 6 \text{ кН},$
 $P_2 = 7 \text{ кН},$
 $x_1 = 5 \text{ м}.$

Задача 20.26.



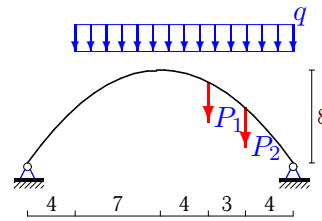
$q = 3 \text{ кН/м},$
 $P_1 = 5 \text{ кН},$
 $P_2 = 3 \text{ кН},$
 $x_1 = 8 \text{ м}.$

Задача 20.27.



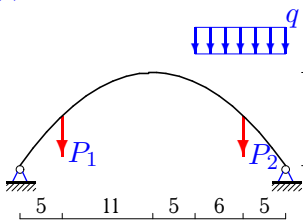
$q = 3 \text{ кН/м},$
 $P_1 = 8 \text{ кН},$
 $P_2 = 7 \text{ кН},$
 $x_1 = 11 \text{ м}.$

Задача 20.28.



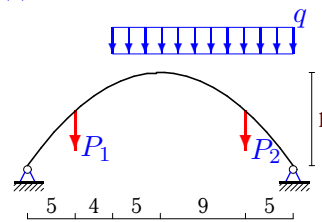
$q = 4 \text{ кН/м},$
 $P_1 = 6 \text{ кН},$
 $P_2 = 5 \text{ кН},$
 $x_1 = 15 \text{ м}.$

Задача 20.29.



$q = 5 \text{ кН/м},$
 $P_1 = 10 \text{ кН},$
 $P_2 = 7 \text{ кН},$
 $x_1 = 27 \text{ м}.$

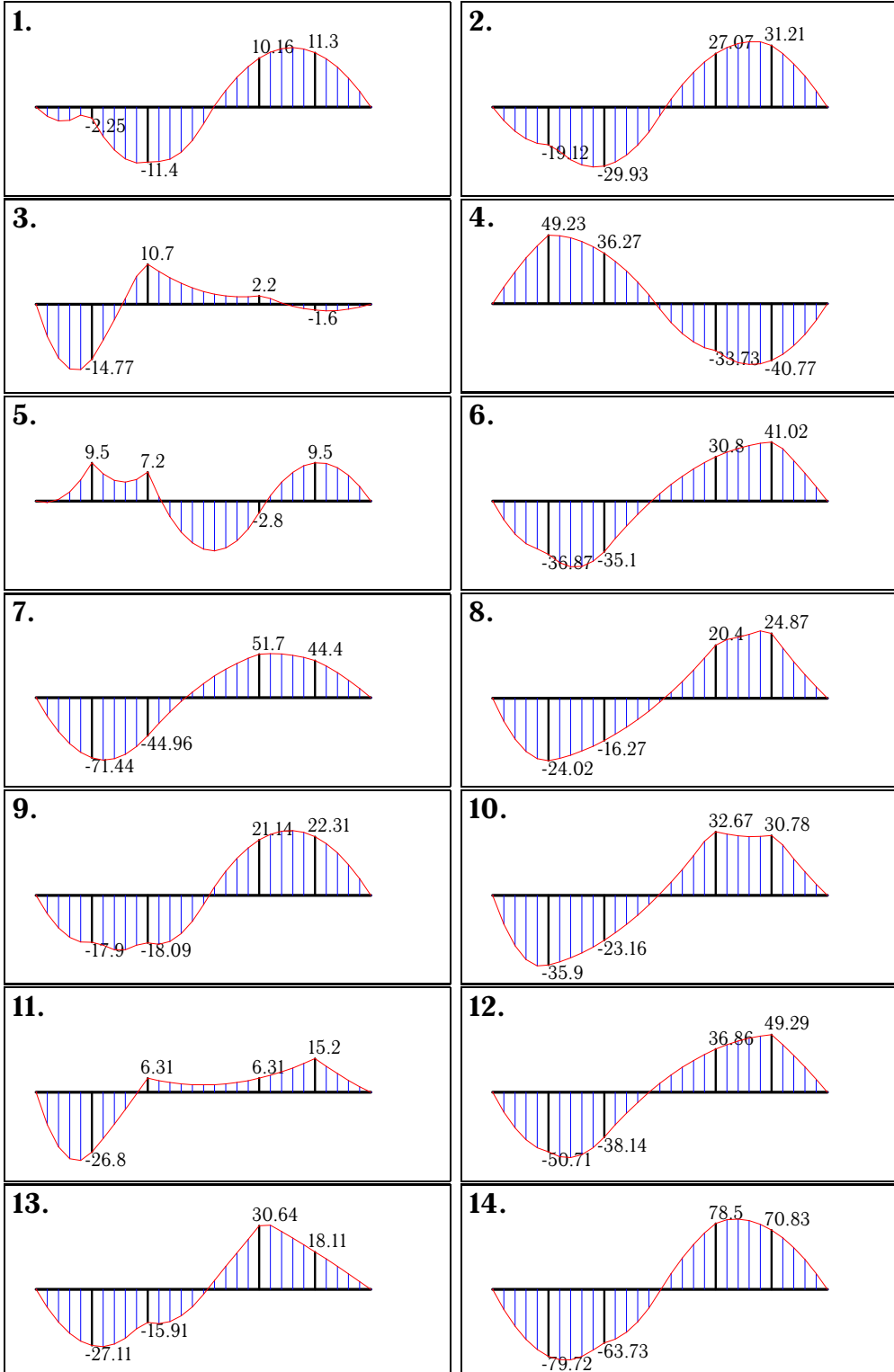
Задача 20.30.

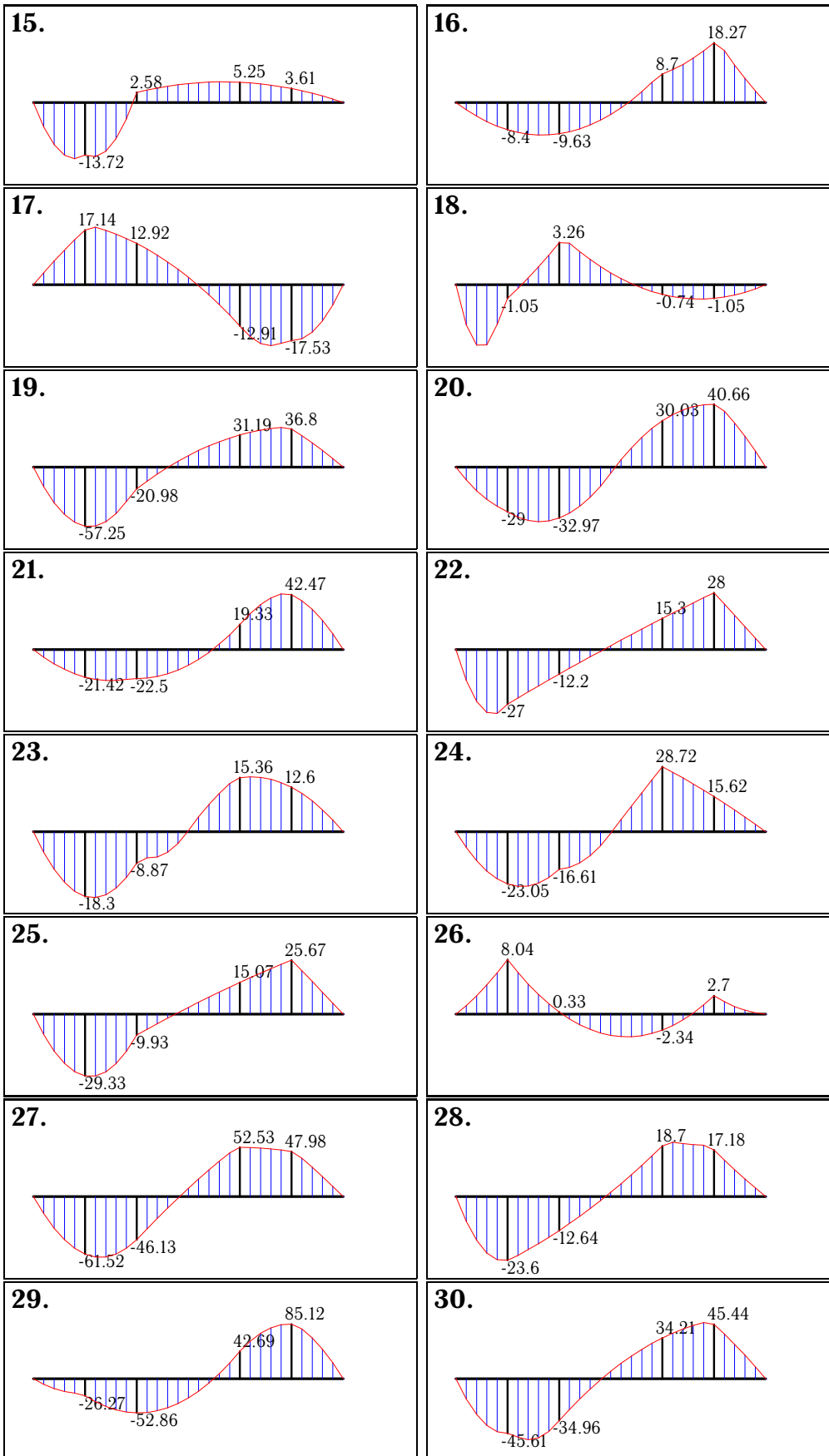


$q = 5 \text{ кН/м},$
 $P_1 = 9 \text{ кН},$
 $P_2 = 10 \text{ кН},$
 $x_1 = 23 \text{ м}.$

Двухшарнирная арка

1. Эпюры моментов в арке, кН/м.





2. Значения $M_p(x_1)$, $Q_p(x_1)$, $N_p(x_1)$ для трехшарнирной арки, коэффициенты канонического уравнения метода сил, неизвестный момент X_1 и $M(x_1)$, $Q(x_1)$, $N(x_1)$ для двухшарнирной арки в заданном сечении x_1 .

N_0	$M_p(x_1)$	$Q_p(x_1)$	$N_p(x_1)$	$EJ\delta_{11}$	$EJ\Delta_{1p}$	X_1	$M(x_1)$	$Q(x_1)$	$N(x_1)$
1	1.290	-3.671	-13.334	15.553	53.612	-3.447	-0.505	-3.936	-13.6108
2	-26.416	0.854	-19.465	16.853	74.480	-4.419	-30.272	0.654	-19.8582
3	8.476	-2.209	-35.331	16.853	-57.512	3.413	11.453	-2.054	-35.0267
4	39.722	-4.696	-21.030	17.817	69.225	-3.885	36.269	-4.854	-21.3854
5	16.111	-1.661	-13.910	17.817	211.951	-11.896	9.502	-2.451	-14.7992
6	38.396	-5.849	-60.901	15.553	-82.976	5.335	41.174	-6.259	-60.4727
7	35.000	-3.488	-64.312	17.817	-301.362	16.914	44.397	-4.612	-63.0476
8	-22.959	0.864	-31.478	16.853	24.162	-1.434	-23.800	0.767	-31.5838
9	25.281	-1.988	-34.756	13.294	46.971	-3.533	23.179	-1.688	-35.0802
10	-22.622	3.246	-44.412	19.114	-13.303	0.696	-21.994	3.271	-44.3536
11	3.333	-1.001	-43.572	21.714	-72.755	3.351	6.312	-0.889	-43.3393
12	30.000	4.112	-40.030	17.817	-137.458	7.715	36.858	3.799	-39.3250
13	-26.059	-0.391	-24.555	16.853	40.496	-2.403	-27.469	-0.553	-24.7322
14	74.247	-4.864	-54.528	20.413	40.907	-2.004	73.082	-4.751	-54.6517
15	-1.778	0.508	-29.225	14.257	-69.889	4.902	2.580	0.757	-28.6651
16	-6.123	-0.485	-35.132	19.114	70.850	-3.707	-8.078	-0.717	-35.3766
17	11.612	-2.018	-21.947	13.294	-31.213	2.348	13.649	-1.881	-21.6873
18	-1.799	0.517	-27.584	15.553	-14.202	0.913	-1.323	0.587	-27.5112
19	32.430	-3.964	-64.297	16.853	-187.869	11.148	38.971	-4.719	-63.4759
20	-28.373	3.374	-18.919	15.553	60.742	-3.905	-31.908	3.204	-19.3187
21	51.347	-4.114	-18.073	13.294	162.944	-12.257	44.054	-3.073	-19.1971
22	26.944	-4.007	-78.654	17.817	-33.865	1.901	28.000	-4.133	-78.5124
23	-18.012	-1.115	-18.171	15.553	-4.279	0.275	-17.869	-1.094	-18.1486
24	-22.667	-1.495	-20.748	14.257	9.783	-0.686	-23.048	-1.552	-20.8116
25	-31.111	-0.955	-28.921	17.817	-57.126	3.206	-29.330	-0.742	-28.6809
26	3.111	-1.117	-31.239	14.257	44.678	-3.134	0.326	-1.276	-31.5968
27	-50.435	9.792	-39.309	19.114	-165.551	8.661	-42.619	10.103	-38.5854
28	19.074	-0.650	-36.686	13.294	-20.311	1.528	20.400	-0.739	-36.5170
29	100.405	-8.259	-32.045	19.114	569.312	-29.786	84.698	-6.399	-34.0131
30	44.483	-5.543	-64.321	16.853	-106.142	6.298	48.179	-5.969	-63.8569