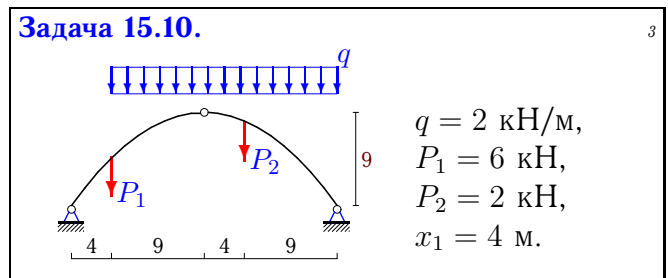
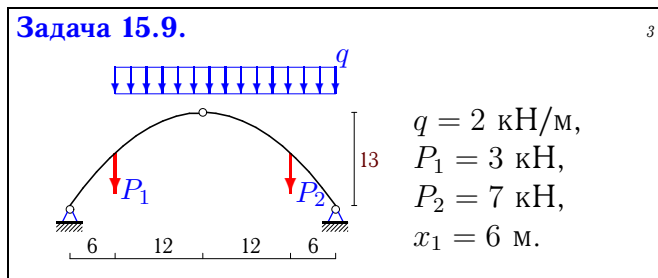
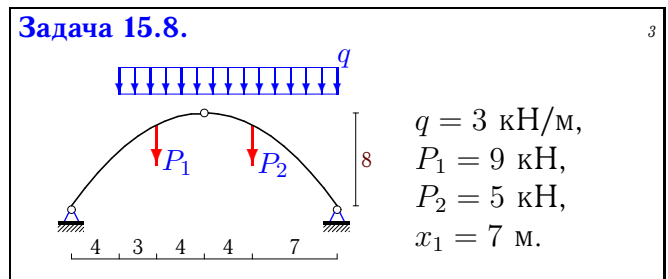
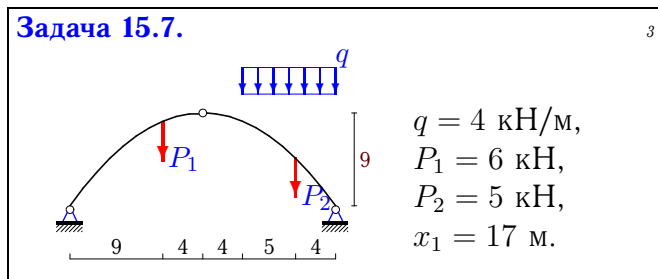
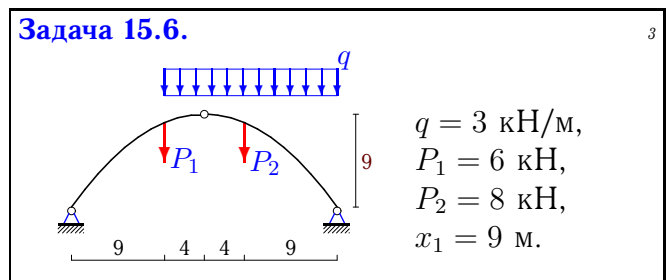
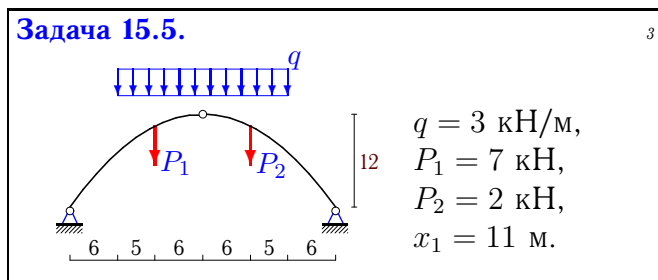
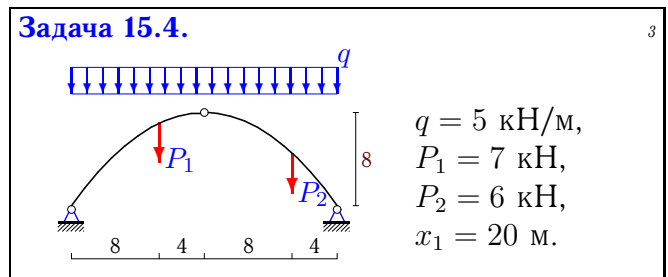
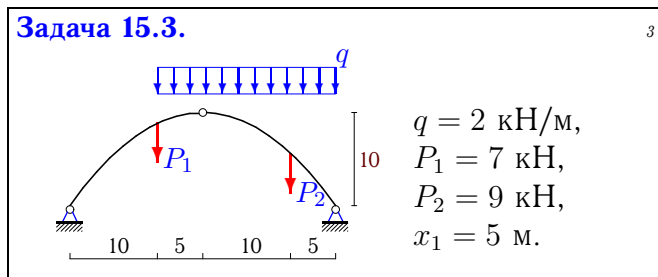
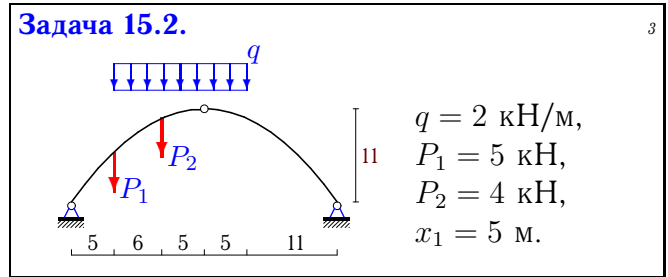
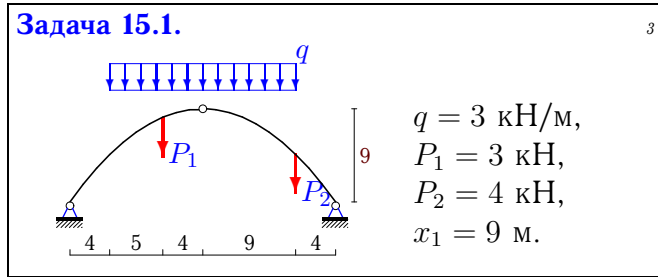


Трехшарнирная арка

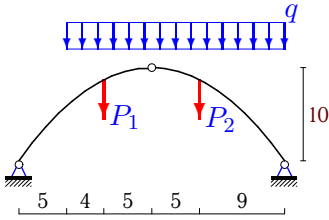
Построить эпюры M , Q , N в трехшарнирной арке параболической формы. Для заданного сечения x_1 вычислить значения $M(x_1)$, $Q(x_1)$, $N(x_1)$. Начало координат находится на левой опоре арки.

В ответах даны вертикальные реакции V_A , V_B , распор H , максимальные значения ординат эпюр момента в арке M_* и соответствующие координаты сечений x_M^* .



Задача 15.11.

3



$$q = 2 \text{ кН/м,}$$

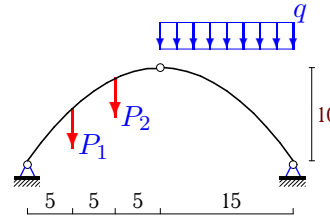
$$P_1 = 10 \text{ кН,}$$

$$P_2 = 9 \text{ кН,}$$

$$x_1 = 5 \text{ м.}$$

Задача 15.12.

3



$$q = 5 \text{ кН/м,}$$

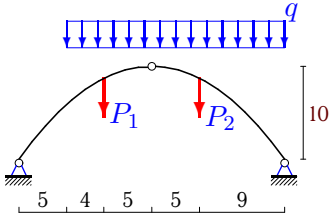
$$P_1 = 8 \text{ кН,}$$

$$P_2 = 5 \text{ кН,}$$

$$x_1 = 25 \text{ м.}$$

Задача 15.13.

3



$$q = 2 \text{ кН/м,}$$

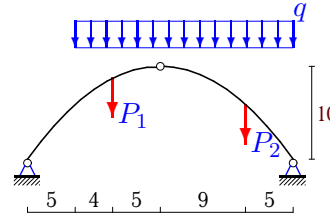
$$P_1 = 3 \text{ кН,}$$

$$P_2 = 5 \text{ кН,}$$

$$x_1 = 5 \text{ м.}$$

Задача 15.14.

3



$$q = 5 \text{ кН/м,}$$

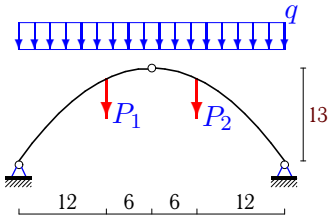
$$P_1 = 5 \text{ кН,}$$

$$P_2 = 3 \text{ кН,}$$

$$x_1 = 23 \text{ м.}$$

Задача 15.15.

3



$$q = 5 \text{ кН/м,}$$

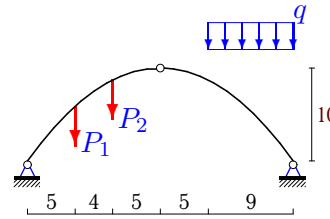
$$P_1 = 4 \text{ кН,}$$

$$P_2 = 10 \text{ кН,}$$

$$x_1 = 30 \text{ м.}$$

Задача 15.16.

3



$$q = 5 \text{ кН/м,}$$

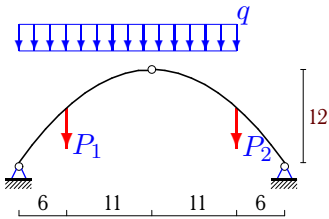
$$P_1 = 5 \text{ кН,}$$

$$P_2 = 4 \text{ кН,}$$

$$x_1 = 23 \text{ м.}$$

Задача 15.17.

3



$$q = 4 \text{ кН/м,}$$

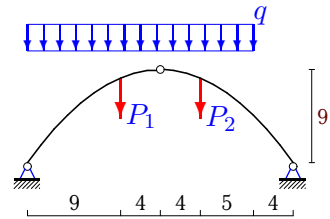
$$P_1 = 3 \text{ кН,}$$

$$P_2 = 10 \text{ кН,}$$

$$x_1 = 23 \text{ м.}$$

Задача 15.18.

3



$$q = 4 \text{ кН/м,}$$

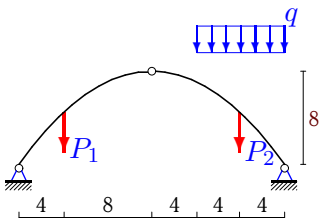
$$P_1 = 10 \text{ кН,}$$

$$P_2 = 3 \text{ кН,}$$

$$x_1 = 17 \text{ м.}$$

Задача 15.19.

3



$$q = 4 \text{ кН/м,}$$

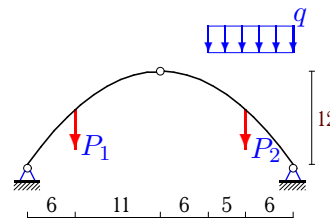
$$P_1 = 3 \text{ кН,}$$

$$P_2 = 9 \text{ кН,}$$

$$x_1 = 16 \text{ м.}$$

Задача 15.20.

3



$$q = 5 \text{ кН/м,}$$

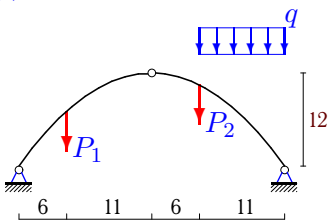
$$P_1 = 4 \text{ кН,}$$

$$P_2 = 3 \text{ кН,}$$

$$x_1 = 28 \text{ м.}$$

Задача 15.21.

3



$$q = 2 \text{ кН/м,}$$

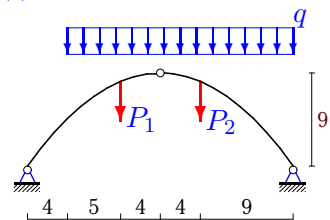
$$P_1 = 4 \text{ кН,}$$

$$P_2 = 6 \text{ кН,}$$

$$x_1 = 6 \text{ м.}$$

Задача 15.22.

3



$$q = 4 \text{ кН/м,}$$

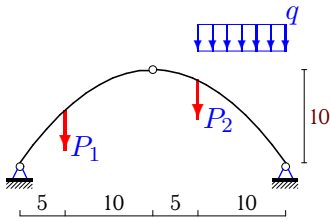
$$P_1 = 7 \text{ кН,}$$

$$P_2 = 4 \text{ кН,}$$

$$x_1 = 17 \text{ м.}$$

Задача 15.23.

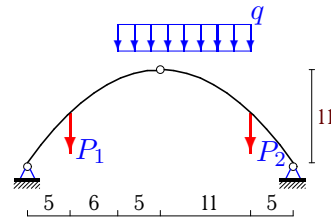
3



$q = 4 \text{ кН/м,}$
 $P_1 = 6 \text{ кН,}$
 $P_2 = 4 \text{ кН,}$
 $x_1 = 20 \text{ м.}$

Задача 15.24.

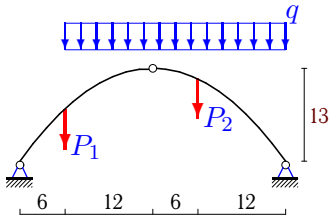
3



$q = 4 \text{ кН/м,}$
 $P_1 = 8 \text{ кН,}$
 $P_2 = 6 \text{ кН,}$
 $x_1 = 21 \text{ м.}$

Задача 15.25.

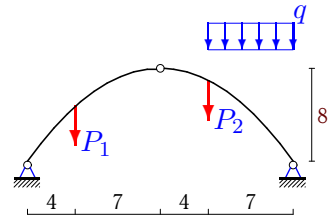
3



$q = 5 \text{ кН/м,}$
 $P_1 = 6 \text{ кН,}$
 $P_2 = 10 \text{ кН,}$
 $x_1 = 30 \text{ м.}$

Задача 15.26.

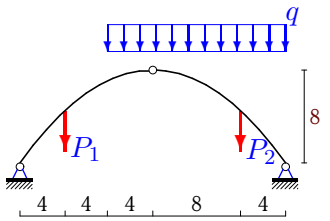
3



$q = 2 \text{ кН/м,}$
 $P_1 = 2 \text{ кН,}$
 $P_2 = 9 \text{ кН,}$
 $x_1 = 4 \text{ м.}$

Задача 15.27.

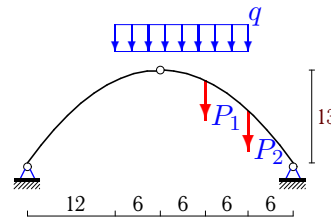
3



$q = 4 \text{ кН/м,}$
 $P_1 = 5 \text{ кН,}$
 $P_2 = 8 \text{ кН,}$
 $x_1 = 16 \text{ м.}$

Задача 15.28.

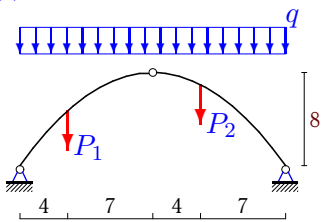
3



$q = 2 \text{ кН/м,}$
 $P_1 = 4 \text{ кН,}$
 $P_2 = 7 \text{ кН,}$
 $x_1 = 6 \text{ м.}$

Задача 15.29.

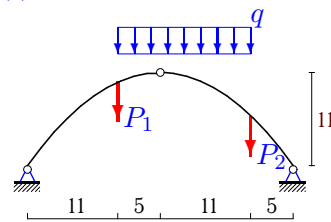
3



$q = 4 \text{ кН/м,}$
 $P_1 = 9 \text{ кН,}$
 $P_2 = 2 \text{ кН,}$
 $x_1 = 15 \text{ м.}$

Задача 15.30.

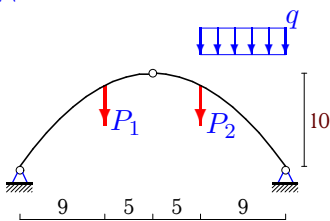
3



$q = 3 \text{ кН/м,}$
 $P_1 = 10 \text{ кН,}$
 $P_2 = 6 \text{ кН,}$
 $x_1 = 11 \text{ м.}$

Задача 15.31.

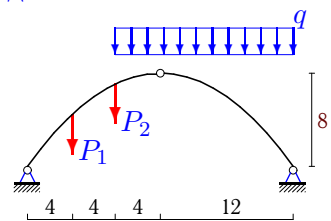
3



$q = 4 \text{ кН/м,}$
 $P_1 = 2 \text{ кН,}$
 $P_2 = 8 \text{ кН,}$
 $x_1 = 19 \text{ м.}$

Задача 15.32.

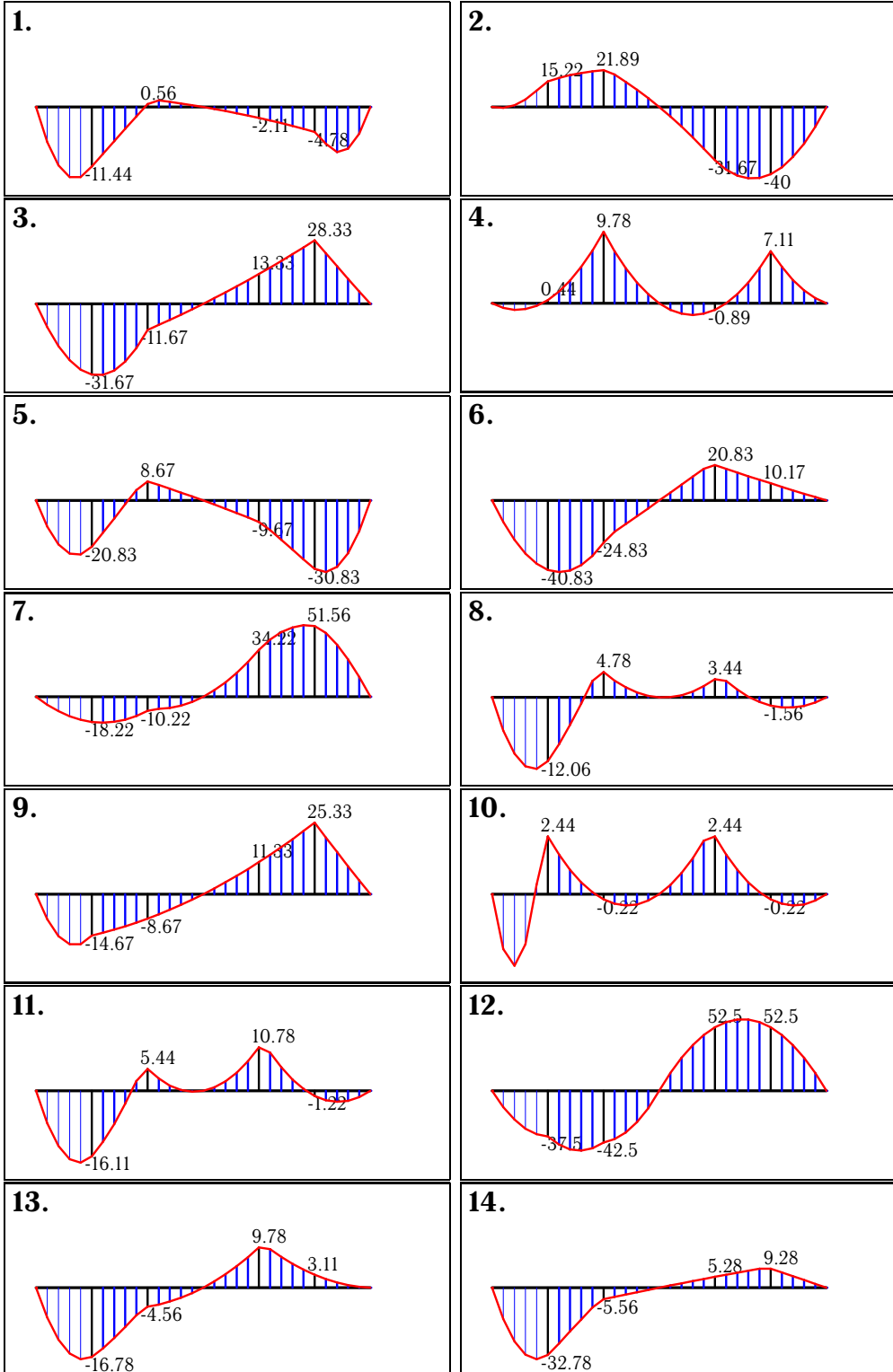
3

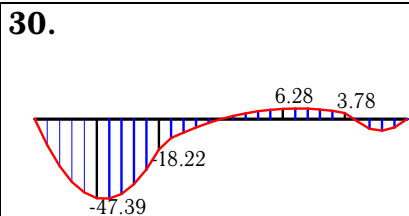
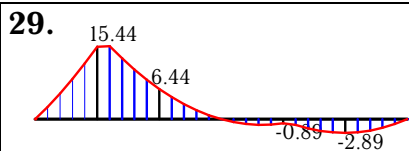
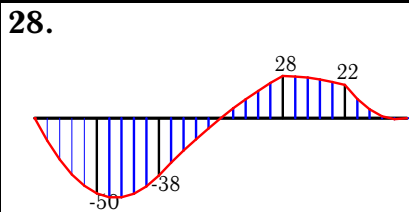
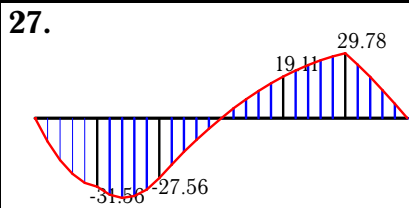
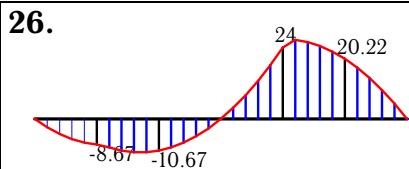
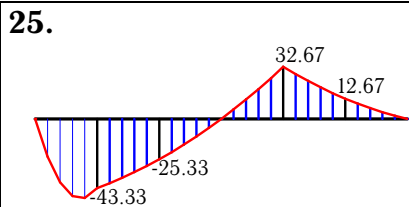
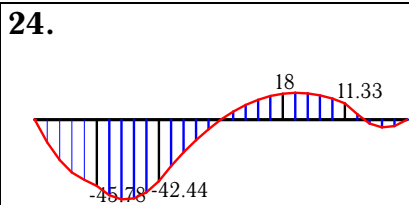
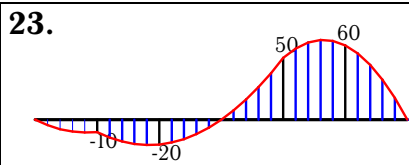
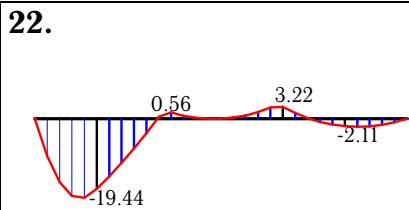
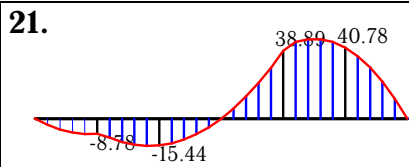
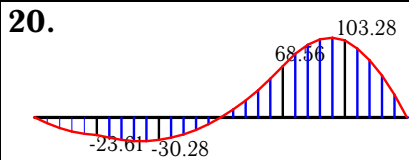
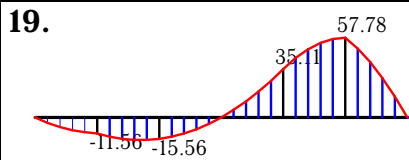
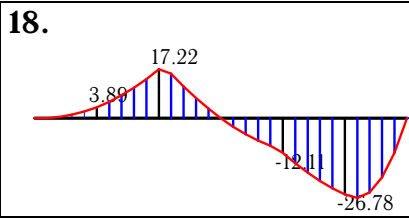
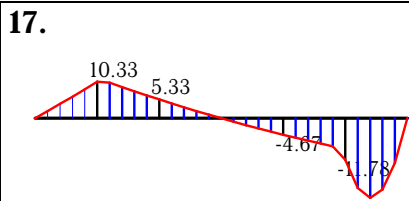
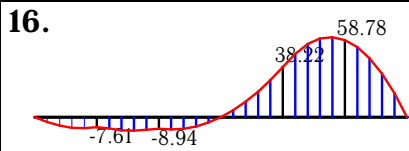
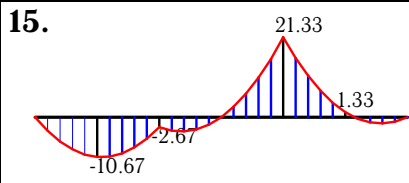


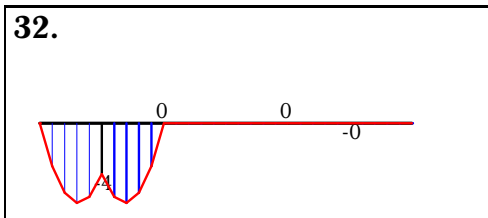
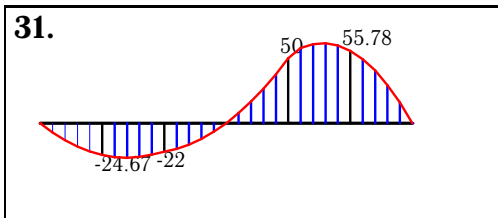
$q = 2 \text{ кН/м,}$
 $P_1 = 6 \text{ кН,}$
 $P_2 = 5 \text{ кН,}$
 $x_1 = 4 \text{ м.}$

Трехшарнирная арка

1. Эпюры моментов в арке, кН/м.







2. Вертикальные реакции V_A , V_B , распор H , максимальный момент M_* в арке и координата соответственного сечения x_* . Значения $M(x_1)$, $Q(x_1)$, $N(x_1)$ для заданного сечения x_1 .

№	V_A	V_B	H	M_*	x_*	$M(x_1)$	$Q(x_1)$	$N(x_1)$
1	29.577	31.423	27.889	13.751	3.033	1.456	-0.280	-30.195
2	25.844	15.156	19.773	42.575	25.067	14.521	1.564	-28.688
3	19.500	36.500	23.250	31.992	5.500	-31.667	-0.872	-30.332
4	65.667	67.333	50.000	9.778	8.000	7.111	-2.159	-68.817
5	38.382	36.618	35.750	32.293	29.467	9.145	-1.281	-39.304
6	23.365	41.635	28.417	42.180	5.200	-21.249	4.838	-32.949
7	10.923	36.077	13.111	52.022	21.233	30.864	9.668	-10.132
8	29.818	38.182	27.313	13.537	2.567	5.620	-2.323	-29.669
9	28.667	41.333	25.846	25.333	30.000	-14.667	0.560	-36.421
10	24.385	27.615	20.222	3.031	1.733	2.769	-0.722	-27.321
11	28.571	36.429	26.900	17.671	3.733	-14.974	2.848	-39.139
12	28.750	59.250	32.625	59.063	22.500	52.500	-3.924	-47.139
13	22.536	31.464	21.950	17.324	3.733	-16.110	1.751	-31.410
14	51.161	71.839	48.875	34.911	3.733	9.930	-1.439	-67.680
15	96.000	98.000	68.769	21.333	24.000	1.333	-1.281	-96.704
16	14.054	39.946	13.175	60.980	22.400	59.930	-2.097	-19.814
17	70.118	54.882	48.417	22.560	30.600	-4.920	-0.678	-54.432
18	58.346	42.654	42.278	28.009	22.533	-10.592	-4.271	-47.774
19	9.333	34.667	11.000	57.778	20.000	35.111	10.255	-7.480
20	12.721	49.279	14.354	106.860	27.200	105.545	-4.553	-23.601
21	8.794	23.206	8.792	45.875	25.500	-8.564	-2.390	-9.724
22	43.192	55.808	41.278	22.124	3.033	3.941	-2.044	-45.739
23	13.000	37.000	13.500	64.400	23.000	50.000	8.224	-11.118
24	33.688	44.313	36.455	55.250	8.000	17.598	1.242	-39.144
25	70.833	95.167	64.846	50.003	4.200	12.667	-1.961	-91.912
26	6.727	18.273	7.500	26.832	15.033	-8.793	-1.625	-8.715
27	26.833	50.167	31.250	36.622	5.600	19.111	3.401	-32.686
28	17.500	29.500	21.462	52.910	7.800	-50.000	-2.281	-27.598
29	52.000	47.000	33.375	16.994	4.033	-0.694	-1.191	-38.386
30	27.000	37.000	31.318	47.917	5.867	-13.857	3.255	-35.486
31	9.714	36.286	12.600	61.538	21.467	54.643	5.472	-11.353
32	19.000	24.000	18.000	6.240	2.400	-4.000	-2.242	-22.090