

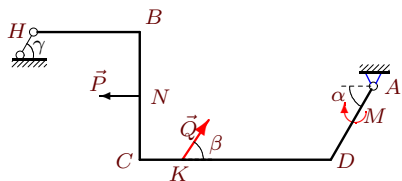
Определение реакций опор рамы

Тяжелая однородная рама расположена в вертикальной плоскости и опирается на неподвижный шарнир A и наклонный невесомый стержень H . К раме приложены горизонтальная сила P , наклонная сила Q и момент M . Учитывая погонный вес рамы ρ , найти реакции опор.

Курсанов М.Н. **Решебник. Теоретическая механика**/Под ред. А. И. Кириллова.– М.: ФИЗМАТЛИТ, 2008. — 384 с. (с.31.)

Задача S-4.1.

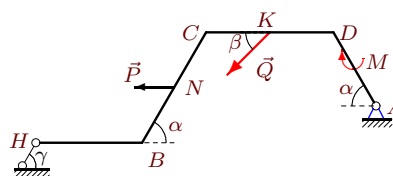
Кошелев Дмитрий



$\rho = 3 \text{ кН/м}$, $P = 9 \text{ кН}$, $Q = 28 \text{ кН}$,
 $M = 25 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 60^\circ$, $\gamma = 60^\circ$,
 $HB = 5 \text{ м}$, $BC = 6 \text{ м}$, $CD = 9 \text{ м}$,
 $DA = 4 \text{ м}$, $CK = 2 \text{ м}$, $CN = 3 \text{ м}$.

Задача S-4.2.

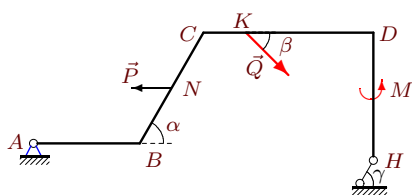
Зеленков Андрей



$\rho = 3 \text{ кН/м}$, $P = 7 \text{ кН}$, $Q = 25 \text{ кН}$,
 $M = 25 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 30^\circ$, $\gamma = 60^\circ$,
 $HB = 5 \text{ м}$, $BC = 6 \text{ м}$, $CD = 6 \text{ м}$,
 $DA = 4 \text{ м}$, $CK = 3 \text{ м}$, $CN = 3 \text{ м}$.

Задача S-4.3.

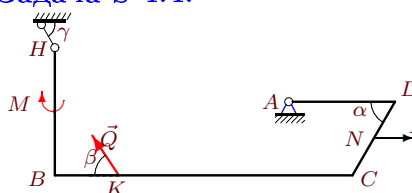
Александров Максим



$\rho = 2 \text{ кН/м}$, $P = 6 \text{ кН}$, $Q = 12 \text{ кН}$,
 $M = 50 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 30^\circ$, $\gamma = 45^\circ$,
 $AB = 5 \text{ м}$, $BC = 6 \text{ м}$, $CD = 8 \text{ м}$,
 $DH = 6 \text{ м}$, $CK = 2 \text{ м}$, $CN = 3 \text{ м}$.

Задача S-4.4.

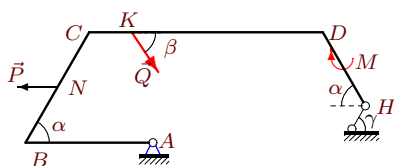
Осеев Сергей



$\rho = 3 \text{ кН/м}$, $P = 9 \text{ кН}$, $Q = 35 \text{ кН}$,
 $M = 25 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 60^\circ$, $\gamma = 60^\circ$,
 $HB = 6 \text{ м}$, $BC = 14 \text{ м}$, $CD = 4 \text{ м}$,
 $DA = 5 \text{ м}$, $BK = 3 \text{ м}$, $CN = 2 \text{ м}$.

Задача S-4.5.

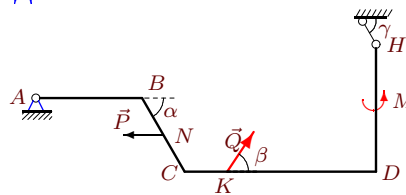
Шанина Инна



$\rho = 1 \text{ кН/м}$, $P = 7 \text{ кН}$, $Q = 25 \text{ кН}$,
 $M = 15 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 60^\circ$, $\gamma = 30^\circ$,
 $AB = 6 \text{ м}$, $BC = 6 \text{ м}$, $CD = 11 \text{ м}$,
 $DH = 4 \text{ м}$, $CK = 2 \text{ м}$, $CN = 3 \text{ м}$.

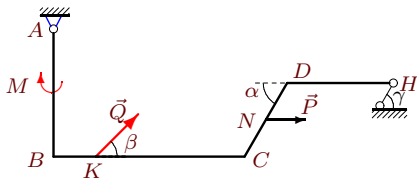
Задача S-4.6.

Мельникова В.А.



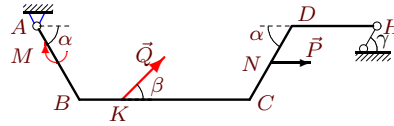
$\rho = 2 \text{ кН/м}$, $P = 8 \text{ кН}$, $Q = 12 \text{ кН}$,
 $M = 50 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 60^\circ$, $\gamma = 45^\circ$,
 $AB = 5 \text{ м}$, $BC = 4 \text{ м}$, $CD = 9 \text{ м}$,
 $DH = 6 \text{ м}$, $CK = 2 \text{ м}$, $CN = 2 \text{ м}$.

Задача S-4.7.



$\rho = 2 \text{ кН/м}$, $P = 6 \text{ кН}$, $Q = 27 \text{ кН}$,
 $M = 20 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 30^\circ$, $\gamma = 45^\circ$,
 $AB = 6 \text{ м}$, $BC = 9 \text{ м}$, $CD = 4 \text{ м}$,
 $DH = 5 \text{ м}$, $BK = 2 \text{ м}$, $CN = 2 \text{ м}$.

Задача S-4.8.



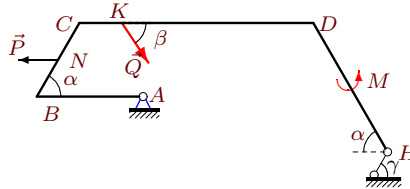
$\rho = 2 \text{ кН/м}$, $P = 6 \text{ кН}$, $Q = 23 \text{ кН}$,
 $M = 20 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 30^\circ$, $\gamma = 45^\circ$,
 $AB = 4 \text{ м}$, $BC = 8 \text{ м}$, $CD = 4 \text{ м}$,
 $DH = 4 \text{ м}$, $BK = 2 \text{ м}$, $CN = 2 \text{ м}$.

Задача S-4.9.



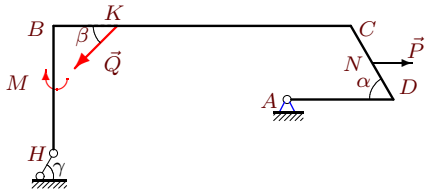
$\rho = 2 \text{ кН/м}$, $P = 7 \text{ кН}$, $Q = 31 \text{ кН}$,
 $M = 20 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 45^\circ$, $\gamma = 45^\circ$,
 $AB = 4 \text{ м}$, $BC = 13 \text{ м}$, $CD = 7 \text{ м}$,
 $DH = 4 \text{ м}$, $BK = 3 \text{ м}$, $CN = 3 \text{ м}$.

Задача S-4.10.



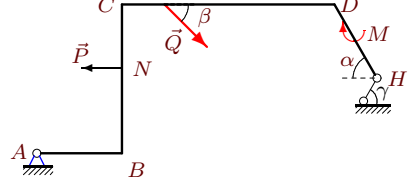
$\rho = 1 \text{ кН/м}$, $P = 7 \text{ кН}$, $Q = 19 \text{ кН}$,
 $M = 30 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 60^\circ$, $\gamma = 30^\circ$,
 $AB = 5 \text{ м}$, $BC = 4 \text{ м}$, $CD = 11 \text{ м}$,
 $DH = 7 \text{ м}$, $BK = 2 \text{ м}$, $CN = 2 \text{ м}$.

Задача S-4.11.



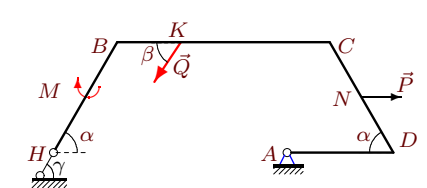
$\rho = 3 \text{ кН/м}$, $P = 7 \text{ кН}$, $Q = 35 \text{ кН}$,
 $M = 25 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 30^\circ$, $\gamma = 60^\circ$,
 $HB = 6 \text{ м}$, $BC = 14 \text{ м}$, $CD = 4 \text{ м}$,
 $DA = 5 \text{ м}$, $BK = 3 \text{ м}$, $CN = 2 \text{ м}$.

Задача S-4.12.



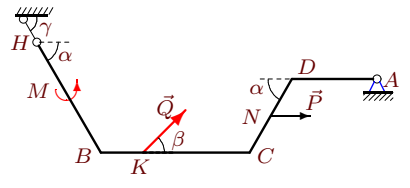
$\rho = 1 \text{ кН/м}$, $P = 6 \text{ кН}$, $Q = 30 \text{ кН}$,
 $M = 15 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 45^\circ$, $\gamma = 30^\circ$,
 $AB = 4 \text{ м}$, $BC = 7 \text{ м}$, $CD = 10 \text{ м}$,
 $DH = 4 \text{ м}$, $CK = 2 \text{ м}$, $CN = 3 \text{ м}$.

Задача S-4.13.



$\rho = 3 \text{ кН/м}$, $P = 9 \text{ кН}$, $Q = 22 \text{ кН}$,
 $M = 25 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 60^\circ$, $\gamma = 60^\circ$,
 $HB = 6 \text{ м}$, $BC = 10 \text{ м}$, $CD = 6 \text{ м}$,
 $DA = 5 \text{ м}$, $BK = 3 \text{ м}$, $CN = 3 \text{ м}$.

Задача S-4.14.



$\rho = 3 \text{ кН/м}$, $P = 7 \text{ кН}$, $Q = 20 \text{ кН}$,
 $M = 70 \text{ кНм}$, $\alpha = 60^\circ$, $\beta = 30^\circ$, $\gamma = 60^\circ$,
 $HB = 6 \text{ м}$, $BC = 7 \text{ м}$, $CD = 4 \text{ м}$,
 $DA = 4 \text{ м}$, $BK = 2 \text{ м}$, $CN = 2 \text{ м}$.

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Ответы.

Определение реакций опор рамы

04.10.2014

	$M_A(Q)$	$M_A(P)$	$\Sigma_k M_A(G_k)$	h	X_A	Y_A	R_H	
1	-169.741	-4.177	588.0	-15.124	-17.863	25.472	25.726	Кошелев Дмитрий
2	137.500	6.062	475.5	-12.990	5.785	35.896	45.731	Зеленков Андрей
3	-114.000	15.588	-487.0	11.882	-36.255	24.138	45.060	Александров Максим
4	-303.109	15.588	280.5	-8.258	6.561	60.047	-3.877	Осеев Сергей
5	-43.301	18.187	-18.5	3.500	-20.003	40.277	16.747	Шанина Инна
6	114.315	-13.856	-472.0	13.107	19.347	20.261	24.532	Мельникова В.А.
7	167.296	25.608	-296.0	13.107	-36.024	27.859	9.392	
8	115.000	10.392	-304.0	11.314	-38.332	16.087	17.555	
9	21.920	-9.813	-491.5	10.297	-19.374	43.626	48.499	
10	-16.454	12.124	-67.3	8.000	-7.001	40.856	5.198	
11	245.000	-12.124	280.5	-8.258	-6.258	53.286	59.137	
12	-275.772	24.000	-186.0	4.938	-94.623	0.366	91.695	
13	152.420	-23.383	160.5	-9.526	-11.885	76.004	27.769	
14	-50.000	12.124	544.5	-12.990	-2.126	14.558	44.389	

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