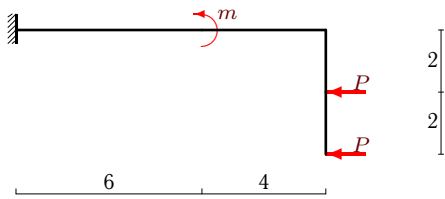


## Определение перемещений в консольной раме

Найти линейные  $\Delta_x$ ,  $\Delta_y$  и угловое перемещение  $\Delta_\varphi$  свободного конца консольной рамы. Условно принять  $EJ = 1$ .

**Задача 38.1.**

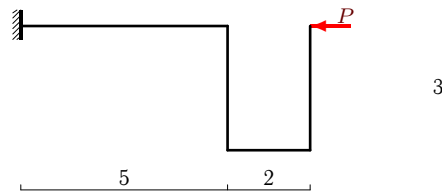
2



$P = 3 \text{ кН}, m = 24 \text{ кНм}$

**Задача 38.2.**

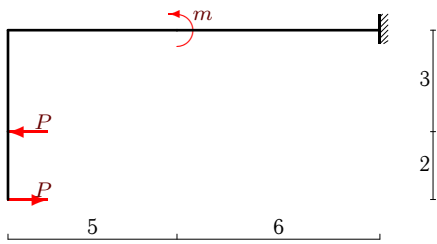
2



$P = 3 \text{ кН}, m = 0 \text{ кНм}$

**Задача 38.3.**

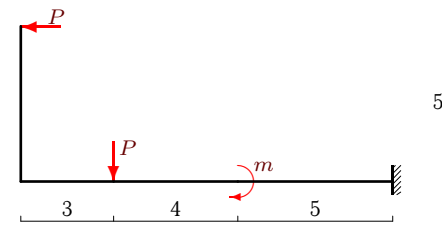
2



$P = 3 \text{ кН}, m = 30 \text{ кНм}$

**Задача 38.4.**

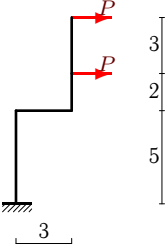
2



$P = 3 \text{ кН}, m = 30 \text{ кНм}$

**Задача 38.5.**

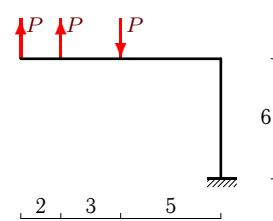
2



$P = 3 \text{ кН}$

**Задача 38.6.**

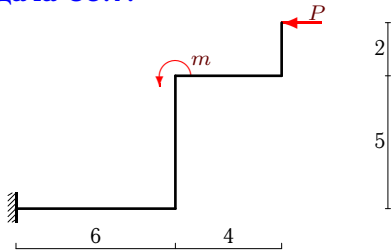
2



$P = 3 \text{ кН}$

**Задача 38.7.**

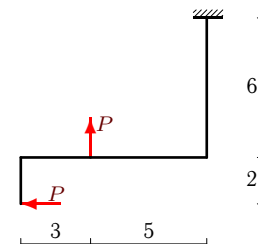
2



$P = 3 \text{ кН}, m = 42 \text{ кНм}$

**Задача 38.8.**

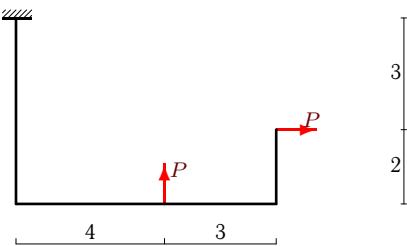
2



$P = 3 \text{ кН}$

**Задача 38.9.**

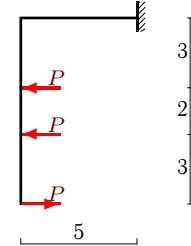
2



$P = 3 \text{ кН}$

**Задача 38.10.**

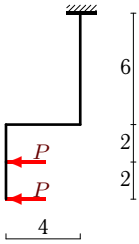
2



$P = 3 \text{ кН}$

**Задача 38.11.**

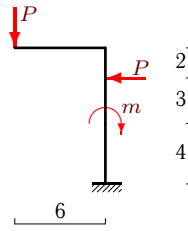
2



$P = 3 \text{ кН}$

**Задача 38.12.**

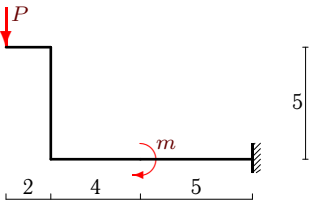
2



$P = 3 \text{ кН}, m = 36 \text{ кНм}$

**Задача 38.13.**

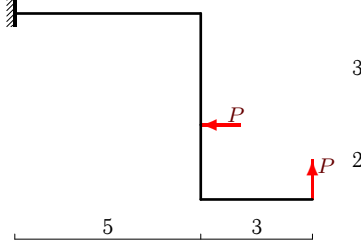
2



$P = 3 \text{ кН}, m = 36 \text{ кНм}$

**Задача 38.14.**

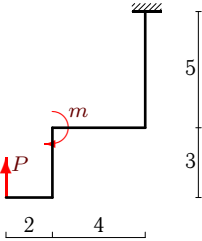
2



$P = 3 \text{ кН}$

**Задача 38.15.**

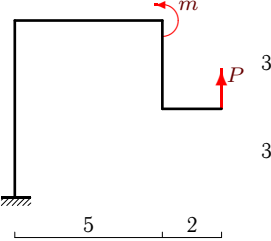
2



$P = 3 \text{ кН}, m = 36 \text{ кНм}$

**Задача 38.16.**

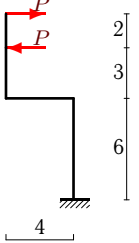
2



$P = 3 \text{ кН}, m = 42 \text{ кНм}$

**Задача 38.17.**

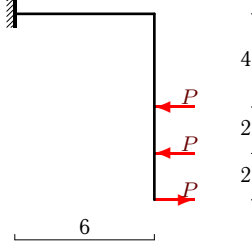
2



$P = 3 \text{ кН}$

**Задача 38.18.**

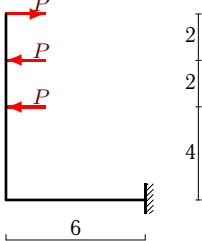
2



$P = 3 \text{ кН}$

**Задача 38.19.**

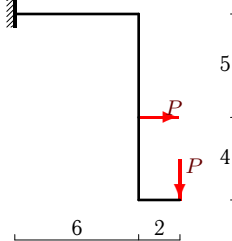
2



$P = 3 \text{ кН}$

**Задача 38.20.**

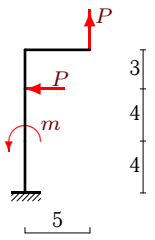
2



$P = 3 \text{ кН}$

**Задача 38.21.**

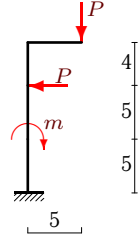
2



$$P = 3 \text{ кН}, m = 30 \text{ кНм}$$

**Задача 38.22.**

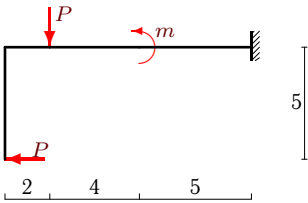
2



$$P = 3 \text{ кН}, m = 30 \text{ кНм}$$

**Задача 38.23.**

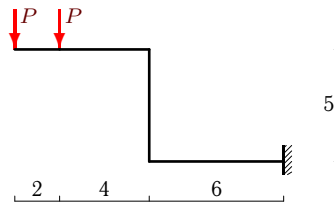
2



$$P = 3 \text{ кН}, m = 30 \text{ кНм}$$

**Задача 38.24.**

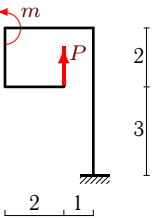
2



$$P = 3 \text{ кН}$$

**Задача 38.25.**

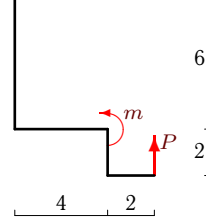
2



$$P = 3 \text{ кН}, m = 6 \text{ кНм}$$

**Задача 38.26.**

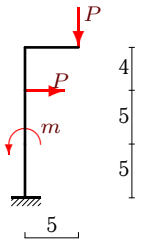
2



$$P = 3 \text{ кН}, m = 36 \text{ кНм}$$

**Задача 38.27.**

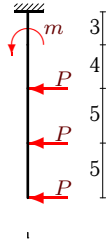
2



$$P = 3 \text{ кН}, m = 30 \text{ кНм}$$

**Задача 38.28.**

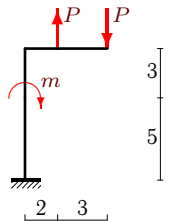
2



$$P = 3 \text{ кН}, m = 84 \text{ кНм}$$

**Задача 38.29.**

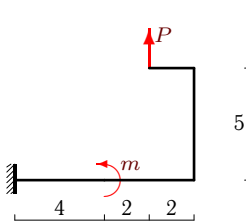
2



$$P = 3 \text{ кН}, m = 30 \text{ кНм}$$

**Задача 38.30.**

2



$$P = 3 \text{ кН}, m = 12 \text{ кНм}$$

**Определение перемещений в консольной раме**

№	$M_1$	$M'_1$	$M_2$	$M'_2$	$M_3$	$M'_3$	$M_4$	$M'_4$	$\Delta_\varphi$	$\Delta_x$	$\Delta_y$
1	0	-6	-6	-18	-18	-18	6	6	-66	-228	108
2	0	9	9	9	9	0	0	0	45	-108	45
3	0	6	6	6	6	6	-24	-24	-90	-499	1077
4	0	15	15	15	15	27	-3	12	189	-882.5	-748.5
5	0	-9	-9	-21	-21	-21	-21	-51	-286.5	1878.5	-634.5
6	0	-6	-6	-24	-24	-39	-39	-39	-442.5	702	3731.5
7	0	6	6	6	-36	-21	-21	-21	-238.5	1436	-1404
8	0	-6	-6	-6	-6	-21	-21	-39	-271.5	-1133	1869.5
9	0	-6	-6	-6	-6	6	6	21	43.5	109	461.5
10	0	9	9	9	9	0	0	0	45	180	0
11	0	-6	-6	-18	-18	-18	-18	-54	-318	-1992	1008
12	0	18	18	18	18	27	-9	3	145.5	-211	-765
13	0	6	6	6	6	18	-18	-3	31.5	-52.5	139
14	0	9	9	9	9	0	0	15	82.5	246	359
15	0	-6	-6	-6	30	18	18	18	162	756	-864
16	0	6	6	6	-36	-21	-21	-21	-244.5	-400.5	-1448
17	0	-6	-6	-6	-6	-6	-6	-6	-84	479	192
18	0	6	6	6	6	-6	-6	-6	-18	-260	-108
19	0	-6	-6	-6	-6	6	6	6	18	-260	-108
20	0	-6	-6	-6	-6	9	9	-9	-22.5	32	-95
21	0	15	15	15	15	27	-3	9	178.5	-627.5	830
22	0	-15	-15	-15	-15	0	30	45	52.5	-1855	325
23	0	-15	-15	-15	-15	-3	27	42	69	407.5	-1339.5
24	0	6	6	30	30	30	30	66	516	-1815	-3928
25	0	6	6	6	12	3	3	3	55.5	49.5	35
26	0	6	6	6	-30	-18	-18	-18	-186	-720	-984
27	0	-15	-15	-15	-15	-30	0	-15	-247.5	1345	-1175
28	0	-15	-15	-45	-45	-81	3	-24	-471	-4893	0
29	0	-9	-9	-9	-9	-9	21	21	46.5	-537	291
30	0	-6	-6	-6	-6	6	-6	6	-36	75	100

№	$\Delta_{x1}$	$\Delta_{x2}$	$\Delta_{x3}$	$\Delta_{x4}$	$\Delta_{y1}$	$\Delta_{y2}$	$\Delta_{y3}$	$\Delta_{y4}$	$\Delta_{\varphi1}$	$\Delta_{\varphi2}$	$\Delta_{\varphi3}$	$\Delta_{\varphi4}$
1	144.0	-288.0	-76.0	-8.0	252.0	-144.0	0.0	0.0	36.0	-72.0	-24.0	-6.0
2	0.0	-27.0	-54.0	-27.0	0.0	27.0	18.0	0.0	0.0	13.5	18.0	13.5
3	-720.0	150.0	63.0	8.0	1152.0	-75.0	0.0	0.0	-144.0	30.0	18.0	6.0
4	-112.5	-420.0	-225.0	-125.0	-245.0	-436.0	-67.5	0.0	22.5	84.0	45.0	37.5
5	1412.5	315.0	124.0	27.0	-540.0	-94.5	0.0	0.0	-180.0	-63.0	-30.0	-13.5
6	702.0	0.0	0.0	0.0	2340.0	1212.5	171.0	8.0	-234.0	-157.5	-45.0	-6.0
7	882.0	610.0	-48.0	-8.0	-882.0	-570.0	48.0	0.0	-126.0	-142.5	24.0	6.0
8	-954.0	-135.0	-36.0	-8.0	1440.0	402.5	27.0	0.0	-180.0	-67.5	-18.0	-6.0
9	65.0	0.0	36.0	8.0	472.5	16.0	-27.0	0.0	67.5	0.0	-18.0	-6.0
10	0.0	81.0	72.0	27.0	0.0	0.0	0.0	0.0	0.0	13.5	18.0	13.5
11	-1620.0	-288.0	-76.0	-8.0	864.0	144.0	0.0	0.0	-216.0	-72.0	-24.0	-6.0
12	68.0	-243.0	-36.0	0.0	72.0	-405.0	-216.0	-216.0	-12.0	67.5	36.0	54.0
13	262.5	-240.0	-75.0	0.0	415.0	-208.0	-60.0	-8.0	-52.5	48.0	30.0	6.0
14	187.5	40.5	18.0	0.0	237.5	40.5	54.0	27.0	37.5	13.5	18.0	13.5
15	495.0	288.0	-27.0	0.0	-540.0	-368.0	36.0	8.0	90.0	96.0	-18.0	-6.0
16	0.0	-427.5	27.0	0.0	-882.0	-610.0	36.0	8.0	-126.0	-142.5	18.0	6.0
17	288.0	120.0	63.0	8.0	144.0	48.0	0.0	0.0	-36.0	-24.0	-18.0	-6.0
18	-288.0	-16.0	36.0	8.0	-108.0	0.0	0.0	0.0	-36.0	0.0	12.0	6.0
19	-288.0	-16.0	36.0	8.0	-108.0	0.0	0.0	0.0	36.0	0.0	-12.0	-6.0
20	0.0	80.0	-48.0	0.0	-54.0	15.0	-48.0	-8.0	0.0	7.5	-24.0	-6.0
21	-124.0	-436.0	-67.5	0.0	60.0	420.0	225.0	125.0	12.0	84.0	45.0	37.5
22	-2187.5	212.5	120.0	0.0	937.5	-187.5	-300.0	-125.0	187.5	-37.5	-60.0	-37.5
23	862.5	-180.0	-150.0	-125.0	-1497.5	128.0	30.0	0.0	172.5	-36.0	-30.0	-37.5
24	-1440.0	-375.0	0.0	0.0	-2700.0	-900.0	-320.0	-8.0	288.0	150.0	72.0	6.0
25	-7.5	45.0	12.0	0.0	-15.0	18.0	24.0	8.0	15.0	22.5	12.0	6.0
26	-540.0	-192.0	12.0	0.0	-648.0	-368.0	24.0	8.0	-108.0	-96.0	12.0	6.0
27	462.5	762.5	120.0	0.0	-187.5	-562.5	-300.0	-125.0	-37.5	-112.5	-60.0	-37.5
28	-508.5	-3072.0	-1187.5	-125.0	0.0	0.0	0.0	0.0	-31.5	-252.0	-150.0	-37.5
29	-577.5	40.5	0.0	0.0	525.0	-135.0	-72.0	-27.0	105.0	-27.0	-18.0	-13.5
30	0.0	0.0	75.0	0.0	16.0	16.0	60.0	8.0	0.0	0.0	-30.0	-6.0