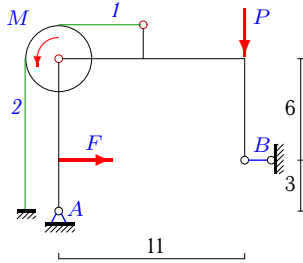


## Составная конструкция из трех тел с нитью

Определить реакции опор конструкции (в кН) и натяжения частей нити. Нить огибает цилиндр весом  $G$  и соединяет части конструкции. Размеры даны в метрах. Конструкция расположена в вертикальной плоскости.

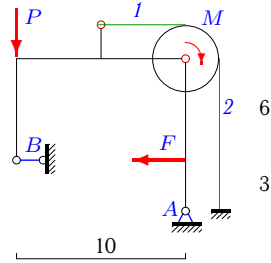
Кирсанов М.Н. Задачи по теоретической механике с решениями в **Maple 11**. – М.: ФИЗМАТЛИТ, 2010. – 264 с. (с.15)

**Задача S-30.1.**



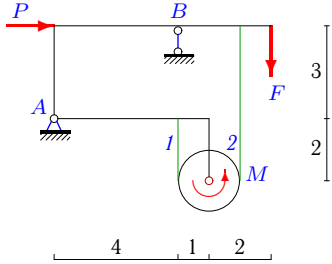
$G = 4 \text{ кН}, F = 27 \text{ кН},$   
 $M = 6 \text{ кНм}, P = 2 \text{ кН}, r = 2 \text{ м}.$

**Задача S-30.2.**



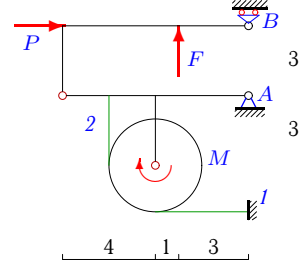
$G = 5 \text{ кН}, F = 18 \text{ кН},$   
 $M = 4 \text{ кНм}, P = 2 \text{ кН}, r = 2 \text{ м}.$

**Задача S-30.3.**



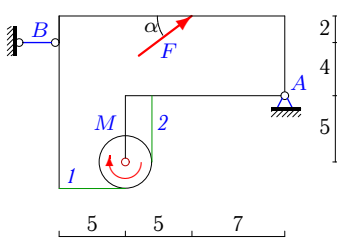
$G = 48 \text{ кН}, F = 8 \text{ кН}, M = 216 \text{ кНм},$   
 $P = 20 \text{ кН}, r = 1 \text{ м}.$

**Задача S-30.4.**



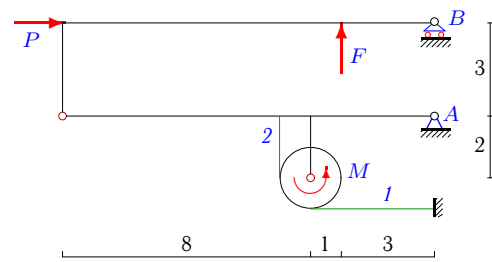
$G = 22 \text{ кН}, F = 16 \text{ кН}, M = 2 \text{ кНм},$   
 $P = 16 \text{ кН}, r = 2 \text{ м}.$

**Задача S-30.5.**



$G = 25 \text{ кН}, F = 20 \text{ кН}, M = 132 \text{ кНм},$   
 $r = 2 \text{ м}, \cos \alpha = 0,8.$

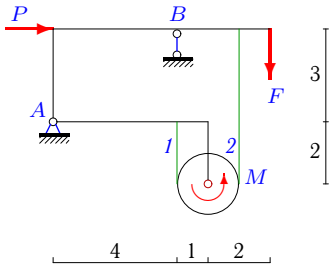
**Задача S-30.6.**



$G = 20 \text{ кН}, F = 12 \text{ кН}, M = 160 \text{ кНм},$   
 $P = 72 \text{ кН}, r = 1 \text{ м}.$

**Задача S-30.7.**

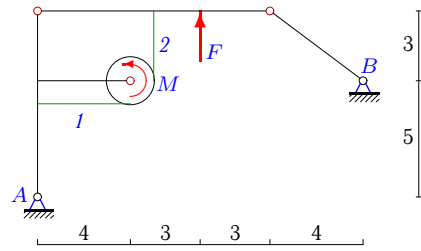
11



$G = 8 \text{ кН}$ ,  $F = 2 \text{ кН}$ ,  $M = 34 \text{ кНм}$ ,  
 $P = 4 \text{ кН}$ ,  $r = 1 \text{ м}$ .

**Задача S-30.8.**

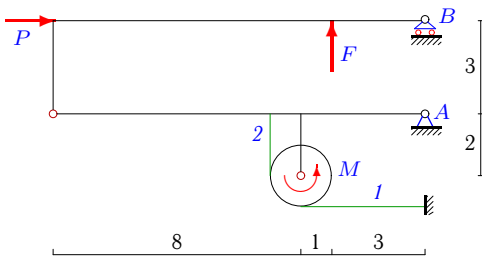
11



$G = 75 \text{ кН}$ ,  $F = 45 \text{ кН}$ ,  
 $M = 109 \text{ кНм}$ ,  $r = 1 \text{ м}$ .

**Задача S-30.9.**

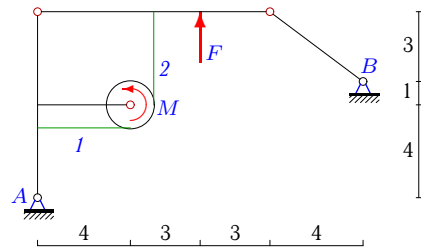
11



$G = 22 \text{ кН}$ ,  $F = 12 \text{ кН}$ ,  $M = 152 \text{ кНм}$ ,  
 $P = 72 \text{ кН}$ ,  $r = 1 \text{ м}$ .

**Задача S-30.10.**

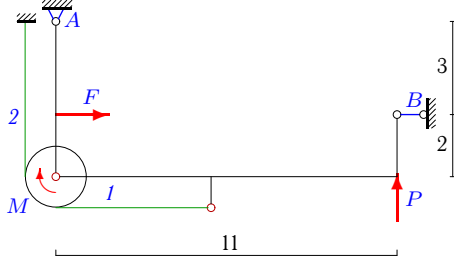
11



$G = 20 \text{ кН}$ ,  $F = 10 \text{ кН}$ ,  
 $M = 72 \text{ кНм}$ ,  $r = 1 \text{ м}$ .

**Задача S-30.11.**

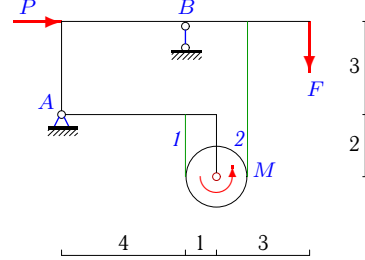
11



$G = 10 \text{ кН}$ ,  $F = 15 \text{ кН}$ ,  
 $M = 4 \text{ кНм}$ ,  $P = 2 \text{ кН}$ ,  $r = 1 \text{ м}$ .

**Задача S-30.12.**

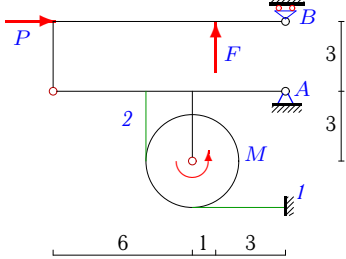
11



$G = 3 \text{ кН}$ ,  $F = 3 \text{ кН}$ ,  $M = 3 \text{ кНм}$ ,  
 $P = 4 \text{ кН}$ ,  $r = 1 \text{ м}$ .

**Задача S-30.13.**

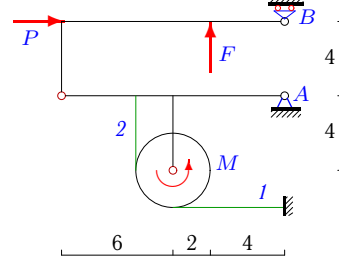
11



$G = 24 \text{ кН}$ ,  $F = 20 \text{ кН}$ ,  $M = 74 \text{ кНм}$ ,  
 $P = 40 \text{ кН}$ ,  $r = 2 \text{ м}$ .

**Задача S-30.14.**

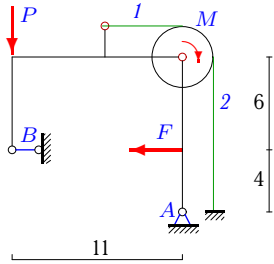
11



$G = 11 \text{ кН}$ ,  $F = 12 \text{ кН}$ ,  $M = 66 \text{ кНм}$ ,  
 $P = 24 \text{ кН}$ ,  $r = 2 \text{ м}$ .

**Задача S-30.15.**

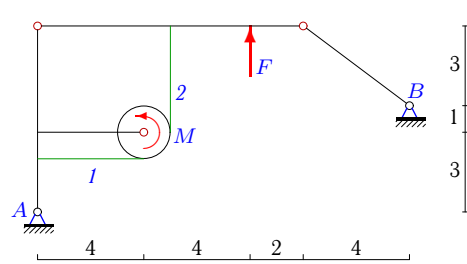
11



$G = 7 \text{ кН}, F = 20 \text{ кН},$   
 $M = 6 \text{ кНм}, P = 4 \text{ кН}, r = 2 \text{ м}.$

**Задача S-30.16.**

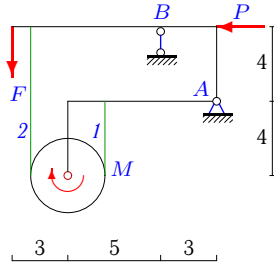
11



$G = 106 \text{ кН}, F = 55 \text{ кН},$   
 $M = 158 \text{ кНм}, r = 1 \text{ м}.$

**Задача S-30.17.**

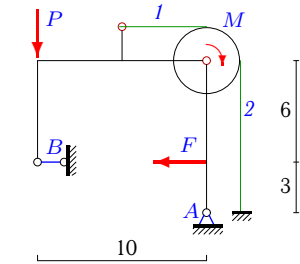
11



$G = 5 \text{ кН}, F = 3 \text{ кН}, M = 30 \text{ кНм},$   
 $P = 5 \text{ кН}, r = 2 \text{ м}.$

**Задача S-30.18.**

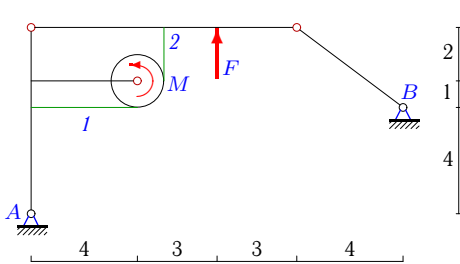
11



$G = 4 \text{ кН}, F = 9 \text{ кН},$   
 $M = 2 \text{ кНм}, P = 1 \text{ кН}, r = 2 \text{ м}.$

**Задача S-30.19.**

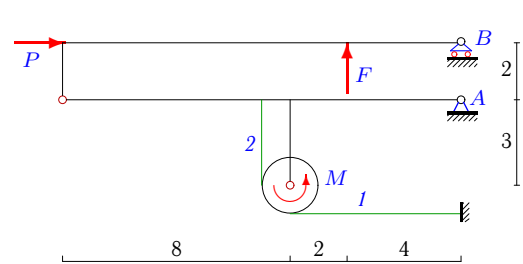
11



$G = 62 \text{ кН}, F = 40 \text{ кН},$   
 $M = 26 \text{ кНм}, r = 1 \text{ м}.$

**Задача S-30.20.**

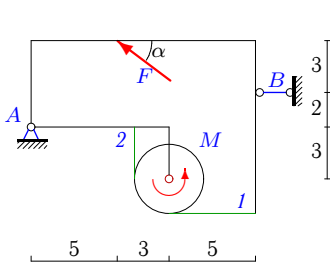
11



$G = 7 \text{ кН}, F = 7 \text{ кН}, M = 66 \text{ кНм},$   
 $P = 42 \text{ кН}, r = 1 \text{ м}.$

**Задача S-30.21.**

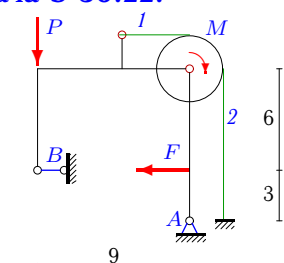
11



$G = 29 \text{ кН}, F = 10 \text{ кН}, M = 212 \text{ кНм},$   
 $r = 2 \text{ м}, \cos \alpha = 0,8.$

**Задача S-30.22.**

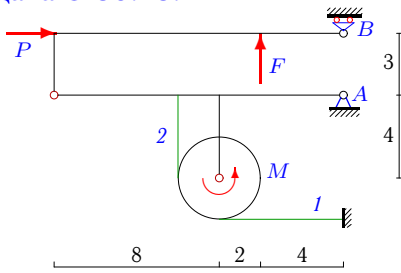
11



$G = 7 \text{ кН}, F = 9 \text{ кН},$   
 $M = 2 \text{ кНм}, P = 2 \text{ кН}, r = 2 \text{ м}.$

**Задача S-30.23.**

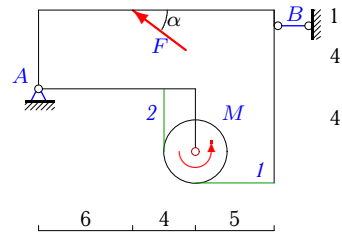
11



$G = 10 \text{ кН}, F = 14 \text{ кН}, M = 116 \text{ кНм},$   
 $P = 42 \text{ кН}, r = 2 \text{ м}.$

**Задача S-30.24.**

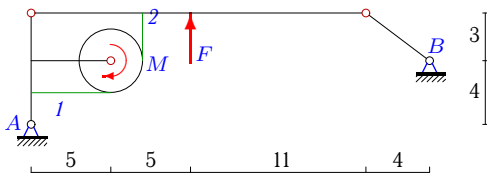
11



$G = 14 \text{ кН}, F = 10 \text{ кН}, M = 92 \text{ кНм},$   
 $r = 2 \text{ м}, \cos \alpha = 0,8.$

**Задача S-30.25.**

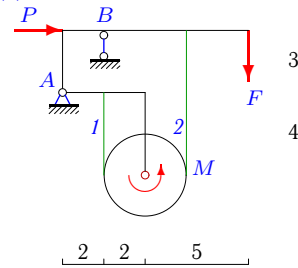
11



$G = 89 \text{ кН}, F = 56 \text{ кН},$   
 $M = 24 \text{ кНм}, r = 2 \text{ м}.$

**Задача S-30.26.**

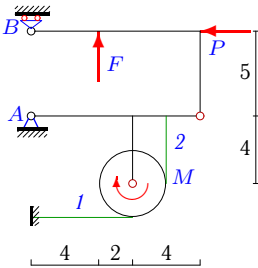
11



$G = 15 \text{ кН}, F = 5 \text{ кН}, M = 42 \text{ кНм},$   
 $P = 3 \text{ кН}, r = 2 \text{ м}.$

**Задача S-30.27.**

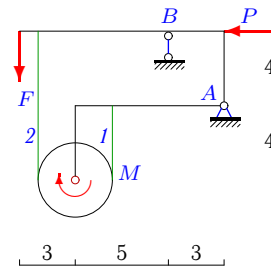
11



$G = 17 \text{ кН}, F = 20 \text{ кН}, M = 42 \text{ кНм},$   
 $P = 20 \text{ кН}, r = 2 \text{ м}.$

**Задача S-30.28.**

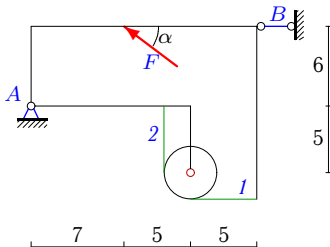
11



$G = 15 \text{ кН}, F = 9 \text{ кН}, M = 90 \text{ кНм},$   
 $P = 9 \text{ кН}, r = 2 \text{ м}.$

**Задача S-30.29.**

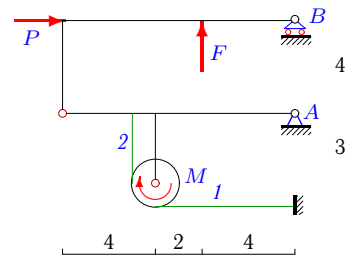
11



$G = 7 \text{ кН}, F = 10 \text{ кН},$   
 $r = 2 \text{ м}, \cos \alpha = 0,8.$

**Задача S-30.30.**

11



$G = 17 \text{ кН}, F = 10 \text{ кН}, M = 6 \text{ кНм},$   
 $P = 20 \text{ кН}, r = 1 \text{ м}.$

**S-30 Ответы.****Составная конструкция из трех тел с нитью**

22.03.2013

№	$X_A$	$Y_A$	$R_B$	$S_1$	$S_2$
1	-18	41	-9	38	35
2	-12	33	6	28	26
3	-20	21	35	220	4
4	-18	10	-4	2	1
5	-19	13	-3	24	90
6	-76	-1	9	4	164
7	-4	2	8	35	1
8	-8	36	-10	160	51
9	-76	1	9	4	156
10	-4	13	-5	80	8
11	-6	28	-9	40	36
12	-4	-6	12	5	2
13	-42	6	-2	2	39
14	-26	-1	0	2	35
15	-12	54	8	46	43
16	-12	60	-15	228	70
17	5	-13	21	16	1
18	-6	18	3	14	13
19	-4	25	-5	76	50
20	-43	-1	1	1	67
21	-17	23	25	4	110
22	-6	26	3	18	17
23	-43	-3	-1	1	59
24	1	8	7	8	54
25	-4	36	-5	59	71
26	-3	-16	36	24	3
27	26	-1	-2	6	27
28	9	-31	55	48	3
29	7	1	1	12	12
30	-26	5	2	6	0

S-30 файл о30s11A