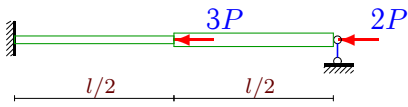


Устойчивость стержня переменного сечения

Прямолинейный стержень длиной l , закрепленный по концам, сжимается одной или двумя продольными силами. Задано соотношение моментов инерции участков стержня. Определить коэффициент μ приведения длины стержня в формуле для критической силы $P_{кр} = \pi^2 EJ / (\mu l)^2$.

Задача 34.1.

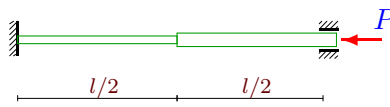
15



$$J_1 = 0.8J, J_2 = J$$

Задача 34.2.

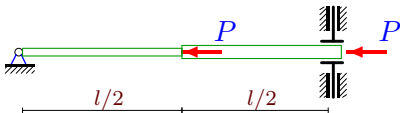
15



$$J_1 = 0.7J, J_2 = J$$

Задача 34.3.

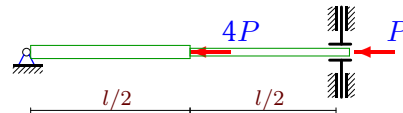
15



$$J_1 = 0.7J, J_2 = J$$

Задача 34.4.

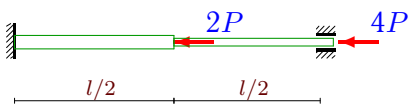
15



$$J_1 = 1.2J, J_2 = J$$

Задача 34.5.

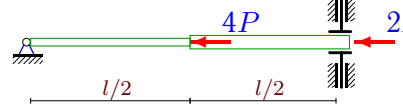
15



$$J_1 = 1.1J, J_2 = J$$

Задача 34.6.

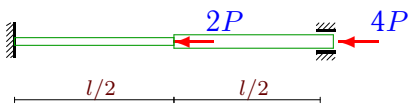
15



$$J_1 = 0.9J, J_2 = J$$

Задача 34.7.

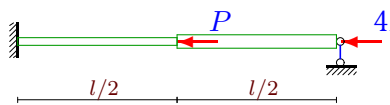
15



$$J_1 = 0.8J, J_2 = J$$

Задача 34.8.

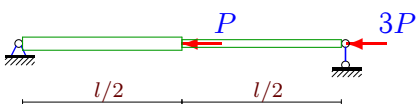
15



$$J_1 = 0.8J, J_2 = J$$

Задача 34.9.

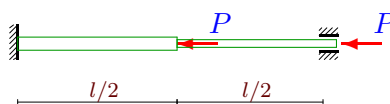
15



$$J_1 = 1.1J, J_2 = J$$

Задача 34.10.

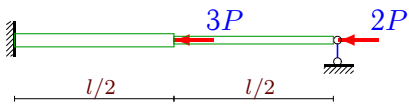
15



$$J_1 = 1.2J, J_2 = J$$

Задача 34.11.

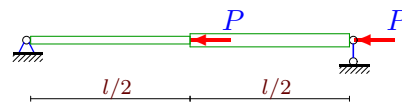
15



$$J_1 = 1.2J, J_2 = J$$

Задача 34.12.

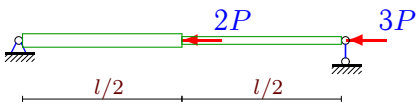
15



$$J_1 = 0.8J, J_2 = J$$

Задача 34.13.

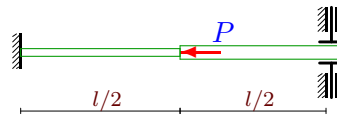
15



$$J_1 = 1.1J, J_2 = J$$

Задача 34.14.

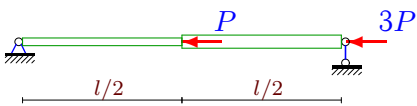
15



$$J_1 = 0.8J, J_2 = J$$

Задача 34.15.

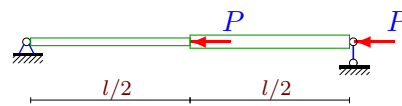
15



$$J_1 = 0.8J, J_2 = J$$

Задача 34.16.

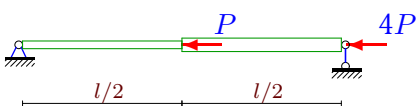
15



$$J_1 = 0.8J, J_2 = J$$

Задача 34.17.

15



$$J_1 = 0.7J, J_2 = J$$

Задача 34.18.

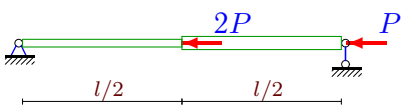
15



$$J_1 = 0.8J, J_2 = J$$

Задача 34.19.

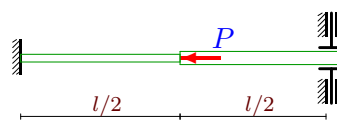
15



$$J_1 = 0.7J, J_2 = J$$

Задача 34.20.

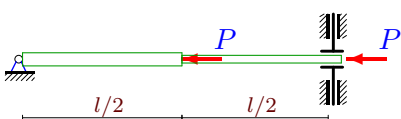
15



$$J_1 = 0.9J, J_2 = J$$

Задача 34.21.

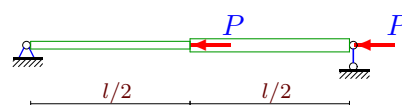
15



$$J_1 = 1.1J, J_2 = J$$

Задача 34.22.

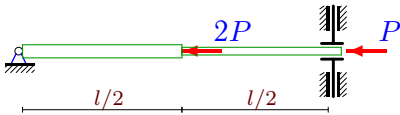
15



$$J_1 = 0.8J, J_2 = J$$

Задача 34.23.

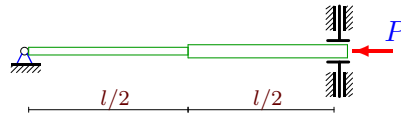
15



$$J_1 = 1.1J, J_2 = J$$

Задача 34.24.

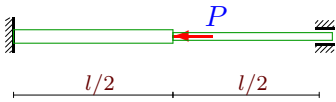
15



$$J_1 = 0.8J, J_2 = J$$

Задача 34.25.

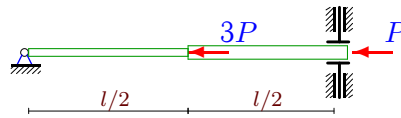
15



$$J_1 = 1.2J, J_2 = J$$

Задача 34.26.

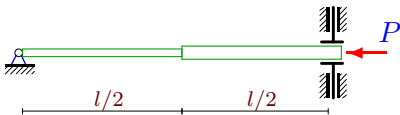
15



$$J_1 = 0.9J, J_2 = J$$

Задача 34.27.

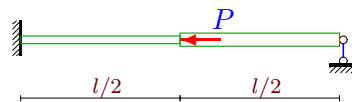
15



$$J_1 = 0.8J, J_2 = J$$

Задача 34.28.

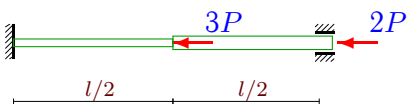
15



$$J_1 = 0.9J, J_2 = J$$

Задача 34.29.

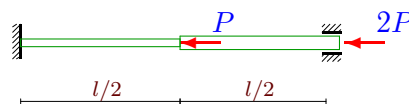
15



$$J_1 = 0.7J, J_2 = J$$

Задача 34.30.

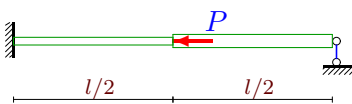
15



$$J_1 = 0.7J, J_2 = J$$

Задача 34.31.

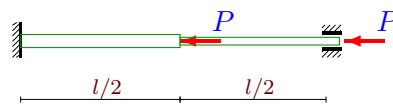
15



$$J_1 = 0.9J, J_2 = J$$

Задача 34.32.

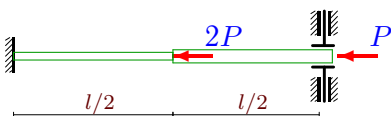
15



$$J_1 = 1.1J, J_2 = J$$

Задача 34.33.

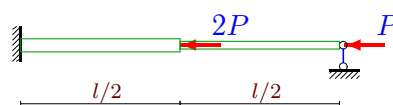
15



$$J_1 = 0.9J, J_2 = J$$

Задача 34.34.

15



$$J_1 = 1.1J, J_2 = J$$

Устойчивость стержня переменного сечения

1	$Pl^2(0.28C_4^2 + 1.55C_4C_5 + 2.18C_5^2) - EJ(1.62C_4^2 + 9.1C_4C_5 + 13C_5^2)$
2	$Pl^2(1.9 \cdot 10^{-2}C_4^2 + 0.1C_4C_5 + 0.12C_5^2) - EJ(0.68C_4^2 + 3.47C_4C_5 + 4.56C_5^2)$
3	$Pl^2(56.75C_4^2 + 360.24C_4C_5 + 571.78C_5^2) - EJ(72.03C_4^2 + 460.17C_4C_5 + 736.5C_5^2)$
4	$Pl^2(133.76C_4^2 + 847.4C_4C_5 + 1342.35C_5^2) - EJ(79.98C_4^2 + 506.55C_4C_5 + 804.23C_5^2)$
5	$Pl^2(9.52 \cdot 10^{-2}C_4^2 + 0.47C_4C_5 + 0.6C_5^2) - EJ(0.84C_4^2 + 4.18C_4C_5 + 5.34C_5^2)$
6	$Pl^2(164.84C_4^2 + 1045.26C_4C_5 + 1657.27C_5^2) - EJ(75.21C_4^2 + 478.73C_4C_5 + 763.6C_5^2)$
7	$Pl^2(9.52 \cdot 10^{-2}C_4^2 + 0.47C_4C_5 + 0.6C_5^2) - EJ(0.72C_4^2 + 3.65C_4C_5 + 4.75C_5^2)$
8	$Pl^2(0.38C_4^2 + 2.13C_4C_5 + 3.03C_5^2) - EJ(1.62C_4^2 + 9.1C_4C_5 + 13C_5^2)$
9	$Pl^2(1.7C_4^2 + 8.47C_4C_5 + 10.59C_5^2) - EJ(5.04C_4^2 + 25.08C_4C_5 + 31.69C_5^2)$
10	$Pl^2(2.86 \cdot 10^{-2}C_4^2 + 0.14C_4C_5 + 0.18C_5^2) - EJ(0.88C_4^2 + 4.35C_4C_5 + 5.53C_5^2)$
11	$Pl^2(0.28C_4^2 + 1.55C_4C_5 + 2.18C_5^2) - EJ(1.98C_4^2 + 10.9C_4C_5 + 15.28C_5^2)$
12	$Pl^2(0.73C_4^2 + 3.61C_4C_5 + 4.49C_5^2) - EJ(4.32C_4^2 + 21.85C_4C_5 + 28.05C_5^2)$
13	$Pl^2(1.94C_4^2 + 9.65C_4C_5 + 12.03C_5^2) - EJ(5.04C_4^2 + 25.08C_4C_5 + 31.69C_5^2)$
14	$Pl^2(0.73C_4^2 + 5.01C_4C_5 + 8.55C_5^2) - EJ(11.22C_4^2 + 77.45C_4C_5 + 134.43C_5^2)$
15	$Pl^2(1.7C_4^2 + 8.47C_4C_5 + 10.59C_5^2) - EJ(4.32C_4^2 + 21.85C_4C_5 + 28.05C_5^2)$
16	$Pl^2(0.73C_4^2 + 3.61C_4C_5 + 4.49C_5^2) - EJ(4.32C_4^2 + 21.85C_4C_5 + 28.05C_5^2)$
17	$Pl^2(2.19C_4^2 + 10.9C_4C_5 + 13.63C_5^2) - EJ(4.08C_4^2 + 20.77C_4C_5 + 26.84C_5^2)$
18	$Pl^2(0.09C_4^2 + 0.49C_4C_5 + 0.7C_5^2) - EJ(1.62C_4^2 + 9.1C_4C_5 + 13C_5^2)$
19	$Pl^2(0.97C_4^2 + 4.8C_4C_5 + 5.93C_5^2) - EJ(4.08C_4^2 + 20.77C_4C_5 + 26.84C_5^2)$
20	$Pl^2(0.73C_4^2 + 5.01C_4C_5 + 8.55C_5^2) - EJ(12C_4^2 + 82.72C_4C_5 + 143.29C_5^2)$
21	$Pl^2(56.75C_4^2 + 360.24C_4C_5 + 571.78C_5^2) - EJ(78.39C_4^2 + 497.27C_4C_5 + 790.69C_5^2)$
22	$Pl^2(0.73C_4^2 + 3.61C_4C_5 + 4.49C_5^2) - EJ(4.32C_4^2 + 21.85C_4C_5 + 28.05C_5^2)$
23	$Pl^2(82.42C_4^2 + 522.63C_4C_5 + 828.64C_5^2) - EJ(78.39C_4^2 + 497.27C_4C_5 + 790.69C_5^2)$
24	$Pl^2(31.09C_4^2 + 197.86C_4C_5 + 314.92C_5^2) - EJ(73.62C_4^2 + 469.45C_4C_5 + 750.05C_5^2)$
25	$Pl^2(0.95 \cdot 10^{-2}C_4^2 + 0.05C_4C_5 + 0.06C_5^2) - EJ(0.88C_4^2 + 4.35C_4C_5 + 5.53C_5^2)$
26	$Pl^2(108.09C_4^2 + 685.01C_4C_5 + 1085.5C_5^2) - EJ(75.21C_4^2 + 478.73C_4C_5 + 763.6C_5^2)$
27	$Pl^2(31.09C_4^2 + 197.86C_4C_5 + 314.92C_5^2) - EJ(73.62C_4^2 + 469.45C_4C_5 + 750.05C_5^2)$
28	$Pl^2(0.04C_4^2 + 0.2C_4C_5 + 0.26C_5^2) - EJ(1.71C_4^2 + 9.55C_4C_5 + 13.57C_5^2)$
29	$Pl^2(6.67 \cdot 10^{-2}C_4^2 + 0.33C_4C_5 + 0.41C_5^2) - EJ(0.68C_4^2 + 3.47C_4C_5 + 4.56C_5^2)$
30	$Pl^2(4.76 \cdot 10^{-2}C_4^2 + 0.24C_4C_5 + 0.3C_5^2) - EJ(0.68C_4^2 + 3.47C_4C_5 + 4.56C_5^2)$
31	$Pl^2(0.04C_4^2 + 0.2C_4C_5 + 0.26C_5^2) - EJ(1.71C_4^2 + 9.55C_4C_5 + 13.57C_5^2)$
32	$Pl^2(2.86 \cdot 10^{-2}C_4^2 + 0.14C_4C_5 + 0.18C_5^2) - EJ(0.84C_4^2 + 4.18C_4C_5 + 5.34C_5^2)$
33	$Pl^2(2.69C_4^2 + 18.55C_4C_5 + 32.02C_5^2) - EJ(12C_4^2 + 82.72C_4C_5 + 143.29C_5^2)$
34	$Pl^2(0.16C_4^2 + 0.87C_4C_5 + 1.22C_5^2) - EJ(1.89C_4^2 + 10.45C_4C_5 + 14.71C_5^2)$

N_0	μ	
1	1.299	$C_0 = 0, C_1 = 0, C_2 = (3C_4 + 7C_5)/2, C_3 = -(5C_4 + 9C_5)/2$
2	0.534	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
3	2.819	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
4	4.063	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
5	1.058	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
6	4.666	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
7	1.156	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
8	1.519	$C_0 = 0, C_1 = 0, C_2 = (3C_4 + 7C_5)/2, C_3 = -(5C_4 + 9C_5)/2$
9	1.825	$C_0 = 0, C_1 = C_4 + (7/3)C_5, C_2 = 0, C_3 = -2C_4 - (10/3)C_5$
10	0.566	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
11	1.187	$C_0 = 0, C_1 = 0, C_2 = (3C_4 + 7C_5)/2, C_3 = -(5C_4 + 9C_5)/2$
12	1.313	$C_0 = 0, C_1 = C_4 + (7/3)C_5, C_2 = 0, C_3 = -2C_4 - (10/3)C_5$
13	1.951	$C_0 = 0, C_1 = C_4 + (7/3)C_5, C_2 = 0, C_3 = -2C_4 - (10/3)C_5$
14	0.815	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
15	1.990	$C_0 = 0, C_1 = C_4 + (7/3)C_5, C_2 = 0, C_3 = -2C_4 - (10/3)C_5$
16	1.313	$C_0 = 0, C_1 = C_4 + (7/3)C_5, C_2 = 0, C_3 = -2C_4 - (10/3)C_5$
17	2.344	$C_0 = 0, C_1 = C_4 + (7/3)C_5, C_2 = 0, C_3 = -2C_4 - (10/3)C_5$
18	0.725	$C_0 = 0, C_1 = 0, C_2 = (3C_4 + 7C_5)/2, C_3 = -(5C_4 + 9C_5)/2$
19	1.596	$C_0 = 0, C_1 = C_4 + (7/3)C_5, C_2 = 0, C_3 = -2C_4 - (10/3)C_5$
20	0.784	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
21	2.673	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
22	1.313	$C_0 = 0, C_1 = C_4 + (7/3)C_5, C_2 = 0, C_3 = -2C_4 - (10/3)C_5$
23	3.221	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
24	2.043	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
25	0.329	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
26	3.782	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
27	2.043	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
28	0.456	$C_0 = 0, C_1 = 0, C_2 = (3C_4 + 7C_5)/2, C_3 = -(5C_4 + 9C_5)/2$
29	1.019	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
30	0.852	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
31	0.456	$C_0 = 0, C_1 = 0, C_2 = (3C_4 + 7C_5)/2, C_3 = -(5C_4 + 9C_5)/2$
32	0.580	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
33	1.487	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
34	0.905	$C_0 = 0, C_1 = 0, C_2 = (3C_4 + 7C_5)/2, C_3 = -(5C_4 + 9C_5)/2$