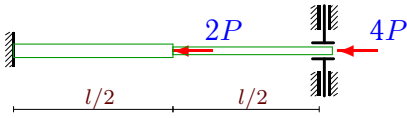


Устойчивость стержня переменного сечения

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.

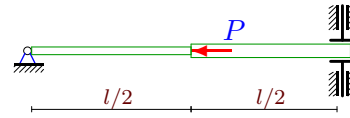
11



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

Задача 34.2.

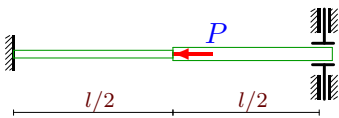
11



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

Задача 34.3.

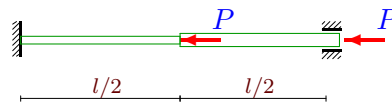
11



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

Задача 34.4.

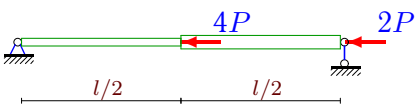
11



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

Задача 34.5.

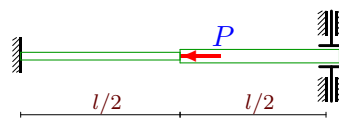
11



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

Задача 34.6.

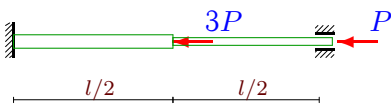
11



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

Задача 34.7.

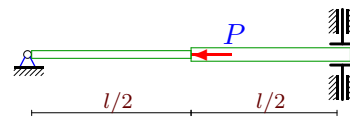
11



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

Задача 34.8.

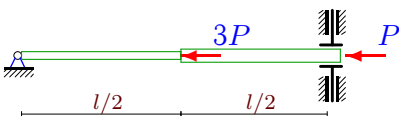
11



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

Задача 34.9.

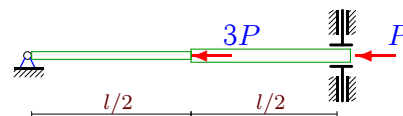
11



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

Задача 34.10.

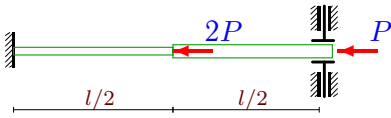
11



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

Задача 34.11.

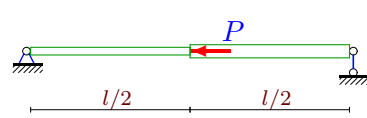
11



$J_1 = 0.9J, J_2 = J$

Задача 34.12.

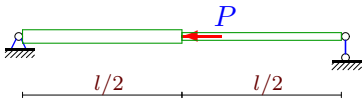
11



$J_1 = 0.8J, J_2 = J$

Задача 34.13.

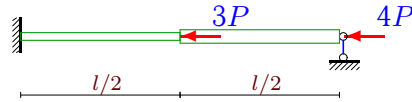
11



$J_1 = 1.2J, J_2 = J$

Задача 34.14.

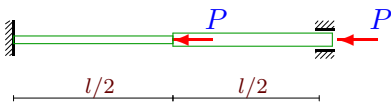
11



$J_1 = 0.8J, J_2 = J$

Задача 34.15.

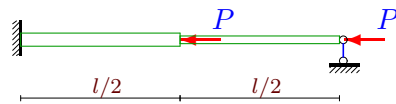
11



$J_1 = 0.9J, J_2 = J$

Задача 34.16.

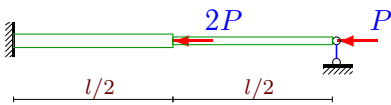
11



$J_1 = 1.1J, J_2 = J$

Задача 34.17.

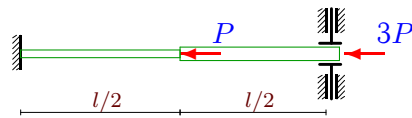
11



$J_1 = 1.1J, J_2 = J$

Задача 34.18.

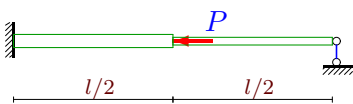
11



$J_1 = 0.8J, J_2 = J$

Задача 34.19.

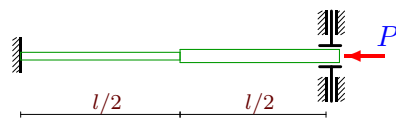
11



$J_1 = 1.1J, J_2 = J$

Задача 34.20.

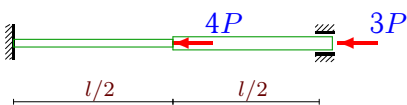
11



$J_1 = 0.7J, J_2 = J$

Задача 34.21.

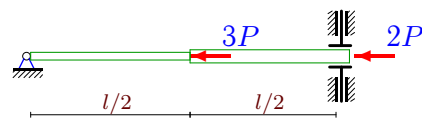
11



$J_1 = 0.7J, J_2 = J$

Задача 34.22.

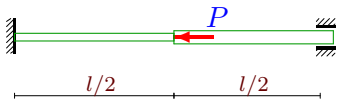
11



$J_1 = 0.7J, J_2 = J$

Задача 34.23.

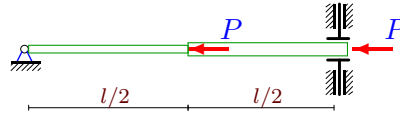
11



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

Задача 34.24.

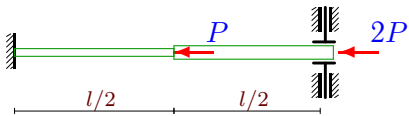
11



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

Задача 34.25.

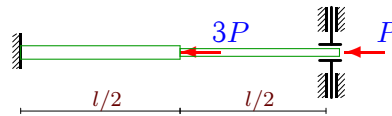
11



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

Задача 34.26.

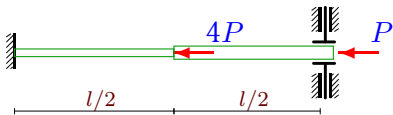
11



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

Задача 34.27.

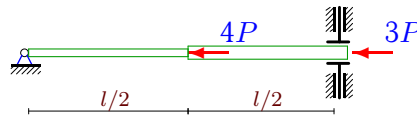
11



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

Задача 34.28.

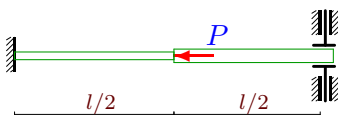
11



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

Задача 34.29.

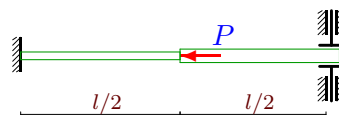
11



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

Задача 34.30.

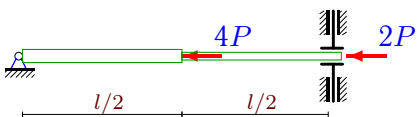
11



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

Задача 34.31.

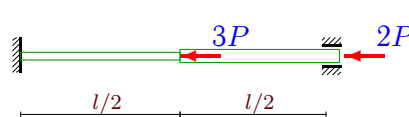
11



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

Задача 34.32.

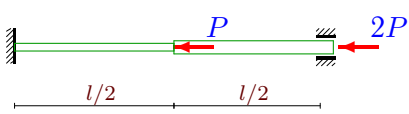
11



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

Задача 34.33.

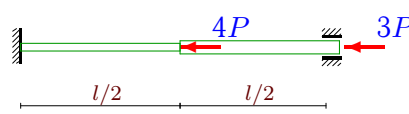
11



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

Задача 34.34.

11



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

Устойчивость стержня переменного сечения

1	$Pl^2(6.35C_4^2 + 44.12C_4C_5 + 76.78C_5^2) - EJ(14.38C_4^2 + 98.55C_4C_5 + 169.86C_5^2)$
2	$Pl^2(25.67C_4^2 + 162.39C_4C_5 + 256.86C_5^2) - EJ(73.62C_4^2 + 469.45C_4C_5 + 750.05C_5^2)$
3	$Pl^2(0.73C_4^2 + 5.01C_4C_5 + 8.55C_5^2) - EJ(11.22C_4^2 + 77.45C_4C_5 + 134.43C_5^2)$
4	$Pl^2(2.86 \cdot 10^{-2}C_4^2 + 0.14C_4C_5 + 0.18C_5^2) - EJ(0.72C_4^2 + 3.65C_4C_5 + 4.75C_5^2)$
5	$Pl^2(1.94C_4^2 + 9.58C_4C_5 + 11.86C_5^2) - EJ(4.56C_4^2 + 22.92C_4C_5 + 29.26C_5^2)$
6	$Pl^2(0.73C_4^2 + 5.01C_4C_5 + 8.55C_5^2) - EJ(12C_4^2 + 82.72C_4C_5 + 143.29C_5^2)$
7	$Pl^2(4.76 \cdot 10^{-2}C_4^2 + 0.23C_4C_5 + 0.3C_5^2) - EJ(0.84C_4^2 + 4.18C_4C_5 + 5.34C_5^2)$
8	$Pl^2(25.67C_4^2 + 162.39C_4C_5 + 256.86C_5^2) - EJ(72.03C_4^2 + 460.17C_4C_5 + 736.5C_5^2)$
9	$Pl^2(108.09C_4^2 + 685.01C_4C_5 + 1085.5C_5^2) - EJ(73.62C_4^2 + 469.45C_4C_5 + 750.05C_5^2)$
10	$Pl^2(108.09C_4^2 + 685.01C_4C_5 + 1085.5C_5^2) - EJ(75.21C_4^2 + 478.73C_4C_5 + 763.6C_5^2)$
11	$Pl^2(2.69C_4^2 + 18.55C_4C_5 + 32.02C_5^2) - EJ(12C_4^2 + 82.72C_4C_5 + 143.29C_5^2)$
12	$Pl^2(0.24C_4^2 + 1.18C_4C_5 + 1.44C_5^2) - EJ(4.32C_4^2 + 21.85C_4C_5 + 28.05C_5^2)$
13	$Pl^2(0.24C_4^2 + 1.18C_4C_5 + 1.44C_5^2) - EJ(5.28C_4^2 + 26.15C_4C_5 + 32.9C_5^2)$
14	$Pl^2(0.45C_4^2 + 2.52C_4C_5 + 3.56C_5^2) - EJ(1.62C_4^2 + 9.1C_4C_5 + 13C_5^2)$
15	$Pl^2(2.86 \cdot 10^{-2}C_4^2 + 0.14C_4C_5 + 0.18C_5^2) - EJ(0.76C_4^2 + 3.83C_4C_5 + 4.95C_5^2)$
16	$Pl^2(0.12C_4^2 + 0.68C_4C_5 + 0.96C_5^2) - EJ(1.89C_4^2 + 10.45C_4C_5 + 14.71C_5^2)$
17	$Pl^2(0.16C_4^2 + 0.87C_4C_5 + 1.22C_5^2) - EJ(1.89C_4^2 + 10.45C_4C_5 + 14.71C_5^2)$
18	$Pl^2(4.4C_4^2 + 30.58C_4C_5 + 53.31C_5^2) - EJ(11.22C_4^2 + 77.45C_4C_5 + 134.43C_5^2)$
19	$Pl^2(0.04C_4^2 + 0.2C_4C_5 + 0.26C_5^2) - EJ(1.89C_4^2 + 10.45C_4C_5 + 14.71C_5^2)$
20	$Pl^2(1.22C_4^2 + 8.52C_4C_5 + 14.92C_5^2) - EJ(10.43C_4^2 + 72.18C_4C_5 + 125.57C_5^2)$
21	$Pl^2(9.52 \cdot 10^{-2}C_4^2 + 0.47C_4C_5 + 0.59C_5^2) - EJ(0.68C_4^2 + 3.47C_4C_5 + 4.56C_5^2)$
22	$Pl^2(139.18C_4^2 + 882.87C_4C_5 + 1400.42C_5^2) - EJ(72.03C_4^2 + 460.17C_4C_5 + 736.5C_5^2)$
23	$Pl^2(0.95 \cdot 10^{-2}C_4^2 + 0.05C_4C_5 + 0.06C_5^2) - EJ(0.76C_4^2 + 3.83C_4C_5 + 4.95C_5^2)$
24	$Pl^2(56.75C_4^2 + 360.24C_4C_5 + 571.78C_5^2) - EJ(75.21C_4^2 + 478.73C_4C_5 + 763.6C_5^2)$
25	$Pl^2(3.17C_4^2 + 22.06C_4C_5 + 38.4C_5^2) - EJ(10.43C_4^2 + 72.18C_4C_5 + 125.57C_5^2)$
26	$Pl^2(3.42C_4^2 + 23.56C_4C_5 + 40.57C_5^2) - EJ(13.59C_4^2 + 93.28C_4C_5 + 161C_5^2)$
27	$Pl^2(4.16C_4^2 + 28.57C_4C_5 + 49.12C_5^2) - EJ(10.43C_4^2 + 72.18C_4C_5 + 125.57C_5^2)$
28	$Pl^2(195.93C_4^2 + 1243.11C_4C_5 + 1972.2C_5^2) - EJ(75.21C_4^2 + 478.73C_4C_5 + 763.6C_5^2)$
29	$Pl^2(0.73C_4^2 + 5.01C_4C_5 + 8.55C_5^2) - EJ(10.43C_4^2 + 72.18C_4C_5 + 125.57C_5^2)$
30	$Pl^2(0.73C_4^2 + 5.01C_4C_5 + 8.55C_5^2) - EJ(12C_4^2 + 82.72C_4C_5 + 143.29C_5^2)$
31	$Pl^2(164.84C_4^2 + 1045.26C_4C_5 + 1657.27C_5^2) - EJ(79.98C_4^2 + 506.55C_4C_5 + 804.23C_5^2)$
32	$Pl^2(6.67 \cdot 10^{-2}C_4^2 + 0.33C_4C_5 + 0.41C_5^2) - EJ(0.76C_4^2 + 3.83C_4C_5 + 4.95C_5^2)$
33	$Pl^2(4.76 \cdot 10^{-2}C_4^2 + 0.24C_4C_5 + 0.3C_5^2) - EJ(0.76C_4^2 + 3.83C_4C_5 + 4.95C_5^2)$
34	$Pl^2(9.52 \cdot 10^{-2}C_4^2 + 0.47C_4C_5 + 0.59C_5^2) - EJ(0.72C_4^2 + 3.65C_4C_5 + 4.75C_5^2)$

N_0	μ	
1	2.133	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
2	1.882	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
3	0.815	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
4	0.636	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
5	2.080	$C_0 = 0, C_1 = C_4 + (7/3)C_5, C_2 = 0, C_3 = -2C_4 - (10/3)C_5$
6	0.784	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
7	0.751	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
8	1.920	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
9	3.841	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
10	3.782	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
11	1.487	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
12	0.786	$C_0 = 0, C_1 = C_4 + (7/3)C_5, C_2 = 0, C_3 = -2C_4 - (10/3)C_5$
13	0.682	$C_0 = 0, C_1 = C_4 + (7/3)C_5, C_2 = 0, C_3 = -2C_4 - (10/3)C_5$
14	1.652	$C_0 = 0, C_1 = 0, C_2 = (3C_4 + 7C_5)/2, C_3 = -(5C_4 + 9C_5)/2$
15	0.614	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
16	0.801	$C_0 = 0, C_1 = 0, C_2 = (3C_4 + 7C_5)/2, C_3 = -(5C_4 + 9C_5)/2$
17	0.905	$C_0 = 0, C_1 = 0, C_2 = (3C_4 + 7C_5)/2, C_3 = -(5C_4 + 9C_5)/2$
18	1.983	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
19	0.429	$C_0 = 0, C_1 = 0, C_2 = (3C_4 + 7C_5)/2, C_3 = -(5C_4 + 9C_5)/2$
20	1.088	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
21	1.216	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
22	4.424	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
23	0.364	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
24	2.734	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
25	1.737	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
26	1.578	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
27	1.994	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
28	5.083	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
29	0.850	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
30	0.784	$C_0 = 0, C_1 = 0, C_2 = 4C_4 + (25/2)C_5, C_3 = -4C_4 - 10C_5$
31	4.511	$C_0 = 0, C_1 = 8C_4 + 25C_5, C_2 = 0, C_3 = -4C_4 - 10C_5$
32	0.940	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
33	0.790	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$
34	1.165	$C_0 = 0, C_1 = 0, C_2 = C_4 + 2C_5, C_3 = -2C_4 - 3C_5$