

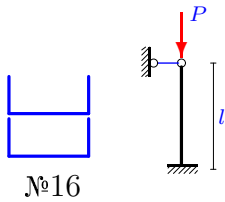
Критическая сила сжатого стержня,

Найти математическое ожидание и дисперсию критической силы P центрально сжатого стержня длиной l , где l — случайная величина, заданная рядом распределения $p = [0.1, 0.3, 0.5, 0.1]$. Известно симметричное поперечное сечение стержня, составленное из двух или четырех прокатных профилей (ГОСТ 8239-89, ГОСТ 8240-89, ГОСТ 8509-86), и схема закрепления. Модуль упругости материала $E = 2 \cdot 10^5$ МПа. При гибкости меньшей $\lambda = \pi\sqrt{E/\sigma_{\text{шп}}}$ пользоваться формулой Ясинского $\sigma_{\text{кр}} = a - b\lambda$, где $a = 310$ МПа, $b = 1.14$ МПа, $\sigma_{\text{шп}} = 195$ МПа.

Задача L-18.1.

2

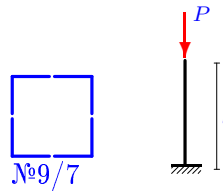
$$l = [6, 6.05, 6.1, 6.15] \text{ м.}$$



Задача L-18.2.

2

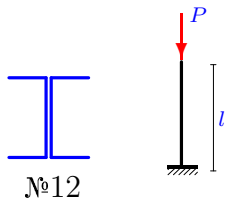
$$l = [5, 5.05, 5.1, 5.15] \text{ м.}$$



Задача L-18.3.

2

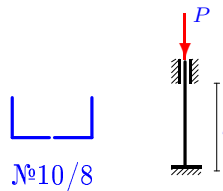
$$l = [1, 1.02, 1.04, 1.06] \text{ м.}$$



Задача L-18.4.

2

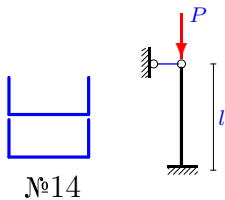
$$l = [7, 7.1, 7.2, 7.3] \text{ м.}$$



Задача L-18.5.

2

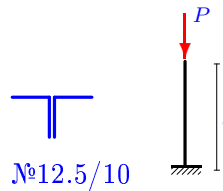
$$l = [5, 5.1, 5.2, 5.3] \text{ м.}$$



Задача L-18.6.

2

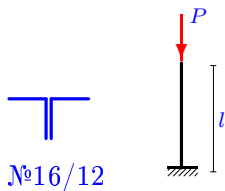
$$l = [3, 3.1, 3.2, 3.3] \text{ м.}$$



Задача L-18.7.

2

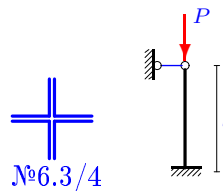
$$l = [4, 4.05, 4.1, 4.15] \text{ м.}$$



Задача L-18.8.

2

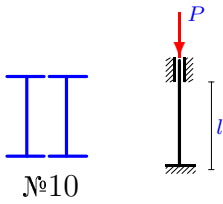
$$l = [3, 3.1, 3.2, 3.3] \text{ м.}$$



Задача L-18.9.

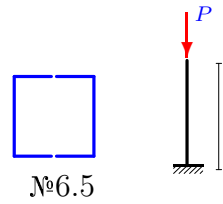
2

$$l = [6, 6.05, 6.1, 6.15] \text{ м.}$$

**Задача L-18.10.**

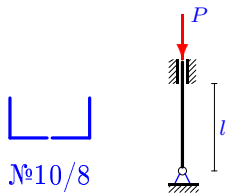
2

$$l = [1, 1.01, 1.02, 1.03] \text{ м.}$$

**Задача L-18.11.**

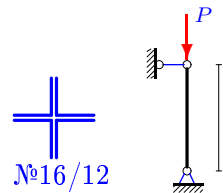
2

$$l = [5, 5.05, 5.1, 5.15] \text{ м.}$$

**Задача L-18.12.**

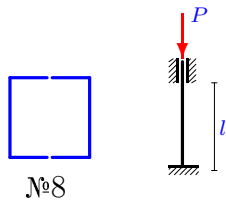
2

$$l = [15, 15.1, 15.2, 15.3] \text{ м.}$$

**Задача L-18.13.**

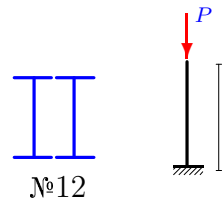
2

$$l = [5, 5.1, 5.2, 5.3] \text{ м.}$$

**Задача L-18.14.**

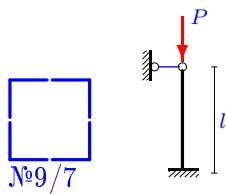
2

$$l = [2, 2.1, 2.2, 2.3] \text{ м.}$$

**Задача L-18.15.**

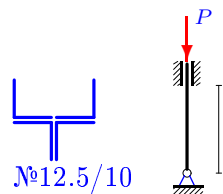
2

$$l = [14, 14.1, 14.2, 14.3] \text{ м.}$$

**Задача L-18.16.**

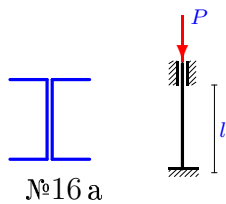
2

$$l = [14, 14.1, 14.2, 14.3] \text{ м.}$$

**Задача L-18.17.**

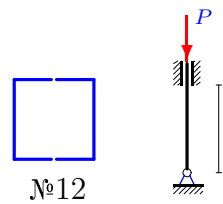
2

$$l = [7, 7.05, 7.1, 7.15] \text{ м.}$$

**Задача L-18.18.**

2

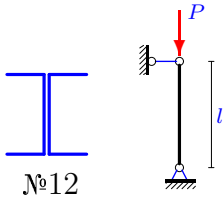
$$l = [6, 6.1, 6.2, 6.3] \text{ м.}$$



Задача L-18.19.

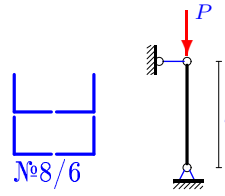
2

$$l = [2, 2.1, 2.2, 2.3] \text{ м.}$$

**Задача L-18.20.**

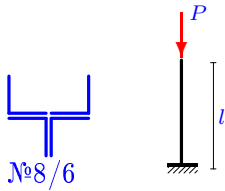
2

$$l = [6, 6.1, 6.2, 6.3] \text{ м.}$$

**Задача L-18.21.**

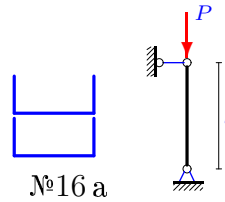
2

$$l = [2, 2.05, 2.1, 2.15] \text{ м.}$$

**Задача L-18.22.**

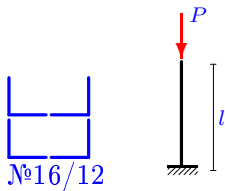
2

$$l = [5, 5.1, 5.2, 5.3] \text{ м.}$$

**Задача L-18.23.**

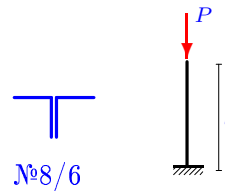
2

$$l = [11, 11.1, 11.2, 11.3] \text{ м.}$$

**Задача L-18.24.**

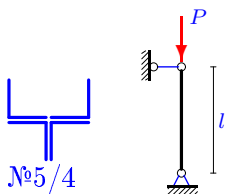
2

$$l = [1, 1.02, 1.04, 1.06] \text{ м.}$$

**Задача L-18.25.**

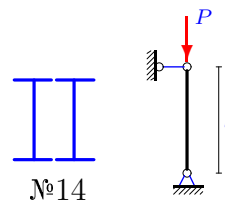
2

$$l = [2, 2.05, 2.1, 2.15] \text{ м.}$$

**Задача L-18.26.**

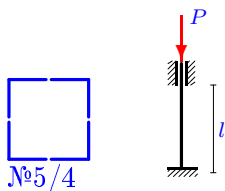
2

$$l = [4, 4.05, 4.1, 4.15] \text{ м.}$$

**Задача L-18.27.**

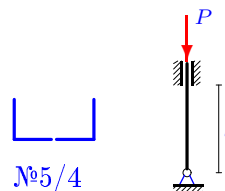
2

$$l = [6, 6.1, 6.2, 6.3] \text{ м.}$$

**Задача L-18.28.**

2

$$l = [1, 1.01, 1.02, 1.03] \text{ м.}$$



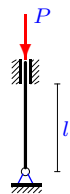
Задача L-18.29.

2

$l = [11, 11.05, 11.1, 11.15]$ м.



№20



L-18

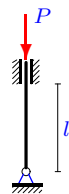
Задача L-18.30.

2

$l = [5, 5.1, 5.2, 5.3]$ м.



№14



Ответы.

Критическая сила сжатого стержня,

22-Jan-16

№	F	J	i	μ	λ	$P_{кр}$	$M(P_{кр})$	$D(P_{кр})$	
	см ²	см ⁴	см	—	—	кН			
1	36.200	497.288	3.706	0.7	113.318	556.467	541.990	51.2054	
2	49.200	2475.132	7.093	2.0	140.988	488.572	473.393	56.0371	
3	26.600	125.485	2.172	2.0	92.082	545.370	536.435	19.9602	(пл)
4	31.200	294.000	3.070	0.5	114.018	473.741	452.975	103.6976	
5	31.200	353.192	3.365	0.7	104.026	569.121	534.762	279.7149	
6	48.600	720.000	3.849	2.0	155.885	394.784	356.512	335.7676	
7	74.800	1826.000	4.941	2.0	161.916	563.184	541.472	113.9025	
8	19.840	132.265	2.582	0.7	81.333	431.084	421.273	24.0639	(пл)
9	24.000	217.300	3.009	0.5	99.700	471.220	463.716	27.4524	(пл)
10	15.020	97.200	2.544	2.0	78.620	331.001	328.847	1.1598	(пл)
11	31.200	294.000	3.070	0.7	114.018	473.741	459.023	52.6867	
12	149.600	6535.106	6.609	1.0	226.950	573.324	561.333	35.2886	
13	17.960	155.560	2.943	0.5	84.946	382.838	377.272	7.7437	(пл)
14	29.400	356.856	3.484	2.0	114.812	440.253	379.035	826.4957	
15	49.200	2475.132	7.093	0.7	138.169	508.717	497.333	31.7638	
16	97.200	2596.923	5.169	0.7	189.596	533.748	521.805	34.9667	
17	39.000	313.600	2.836	0.5	123.428	505.324	494.016	31.3415	
18	26.600	418.723	3.968	0.7	105.859	468.552	444.754	135.3475	
19	26.600	125.485	2.172	1.0	92.082	545.370	516.668	394.1310	(пл)
20	37.520	828.320	4.699	1.0	127.698	454.177	431.109	127.1701	
21	37.520	407.950	3.297	2.0	121.308	503.288	465.839	328.1083	
22	39.000	608.440	3.950	1.0	126.588	480.405	451.402	199.3065	
23	149.600	13226.400	9.403	2.0	233.974	539.419	524.143	56.8922	
24	18.760	114.000	2.465	2.0	81.132	408.047	402.495	7.7073	(пл)
25	15.560	66.472	2.067	1.0	96.764	310.716	300.150	52.9622	(пл)
26	34.800	547.423	3.966	1.0	100.853	675.356	649.319	163.7939	
27	15.560	240.744	3.933	0.5	76.269	347.071	343.463	3.2539	(пл)
28	7.780	18.420	1.539	0.7	45.493	200.831	200.186	0.1042	(пл)
29	53.600	1570.000	5.412	0.7	142.273	522.695	515.194	13.8877	
30	31.200	353.192	3.365	0.7	104.026	569.121	534.762	279.7149	

L-18 файл o18L2A