

11.1

1.

1.1

$$R = (2,99 \pm 0,05) \quad (1)$$

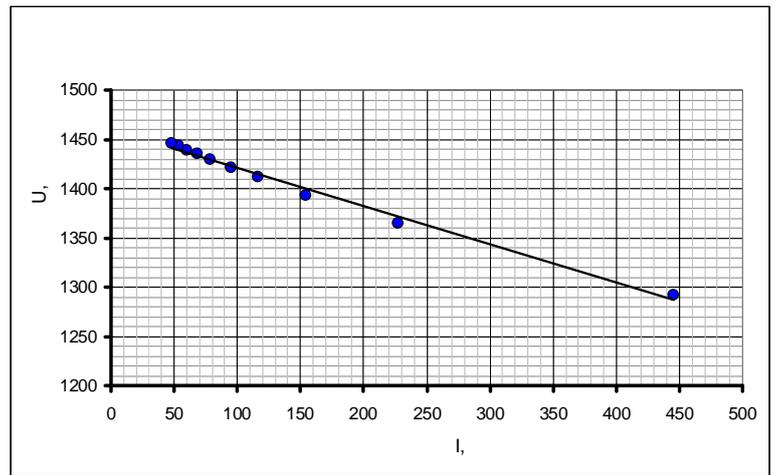
1.2

:

1 () .

1.

R,	U,	I,
2,9	1292	445,5
6,0	1365	227,5
9,0	1393	154,8
12,1	1412	116,7
15,0	1421	94,7
18,1	1430	79,0
21,1	1435	68,0
23,9	1439	60,2
27,0	1443	53,4
29,9	1446	48,4



$$U = \varepsilon - Ir ,$$

$$\varepsilon = (1460 \pm 4)$$

$$r = (0,39 \pm 0,02)$$

2.

$$\varphi_n = \begin{cases} \varphi_4 \frac{n}{4} & n = 0,1,\dots,4 \\ \varphi_4 \frac{10-n}{6} & n = 4,5,\dots,10 \end{cases}$$

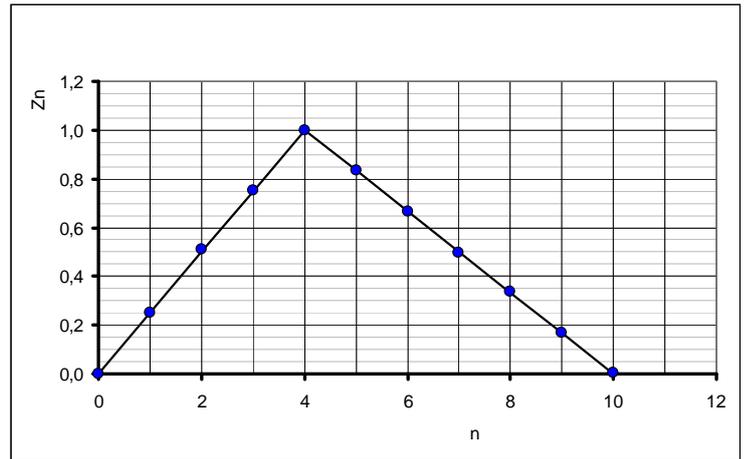
φ_4 .

$$Z_n = \frac{\varphi_n}{\varphi_4} .$$

2

2.

n	Z_n ()	φ_n ,	Z_n
0	0,00	5,0	0,00
1	0,25	343,0	0,25
2	0,50	697,0	0,51
3	0,75	1030,0	0,75
4	1,00	1368,0	1,00
5	0,83	1140,0	0,83
6	0,67	910,0	0,67
7	0,50	679,0	0,50
8	0,33	463,0	0,34
9	0,17	230,0	0,17
10	0,00	6,0	0,00

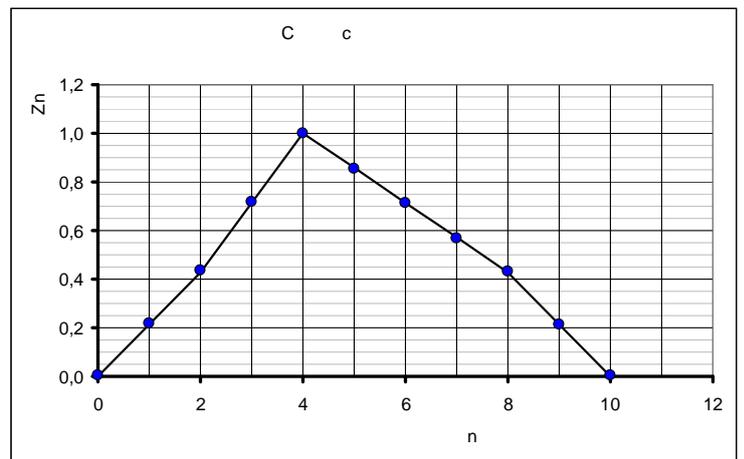


3.

3

3.

n	Z_n ()	φ_n ,	Z_n
0	0,00	5	0,00
1	0,21	289	0,22
2	0,43	583	0,44
3	0,71	958	0,72
4	1,00	1333	1,00
5	0,86	1140	0,86
6	0,71	952	0,71
7	0,57	758	0,57
8	0,43	575	0,43
9	0,21	285	0,21
10	0,00	6	0,00



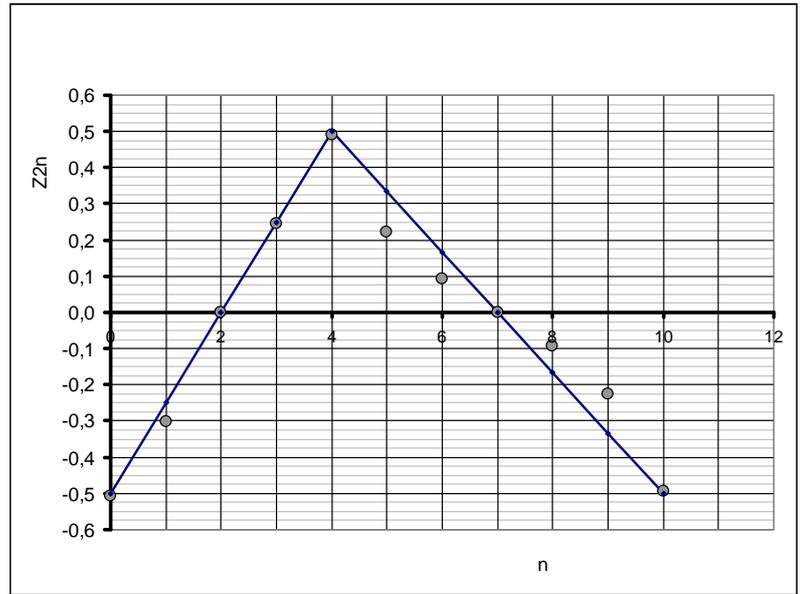
4.

4.

$$(\varphi_4 - \varphi_0)$$

4.

n	U_{2n} ,	Z_{2n}
0	-315	-0,508
1	-186	-0,300
2	0	0,000
3	152	0,245
4	305	0,492
5	137	0,221
6	58	0,094
7	0	0,000
8	-57	-0,092
9	-140	-0,226
10	-307	-0,495



(2).

2 7.

11-2.

1.

$$T_0 = (1,58 \pm 0,03) \tag{1}$$

2.

T(n)

2.1

K

$$\frac{K}{K_0} = \frac{m_0 + nm}{m_0} = 1 + n \frac{m}{m_0} \tag{2}$$

$$z = \frac{T}{T_0} = \sqrt{\frac{1}{1 + n \frac{m}{m_0}}} \tag{3}$$

$$\frac{1}{T^2} = f(n).$$

1.

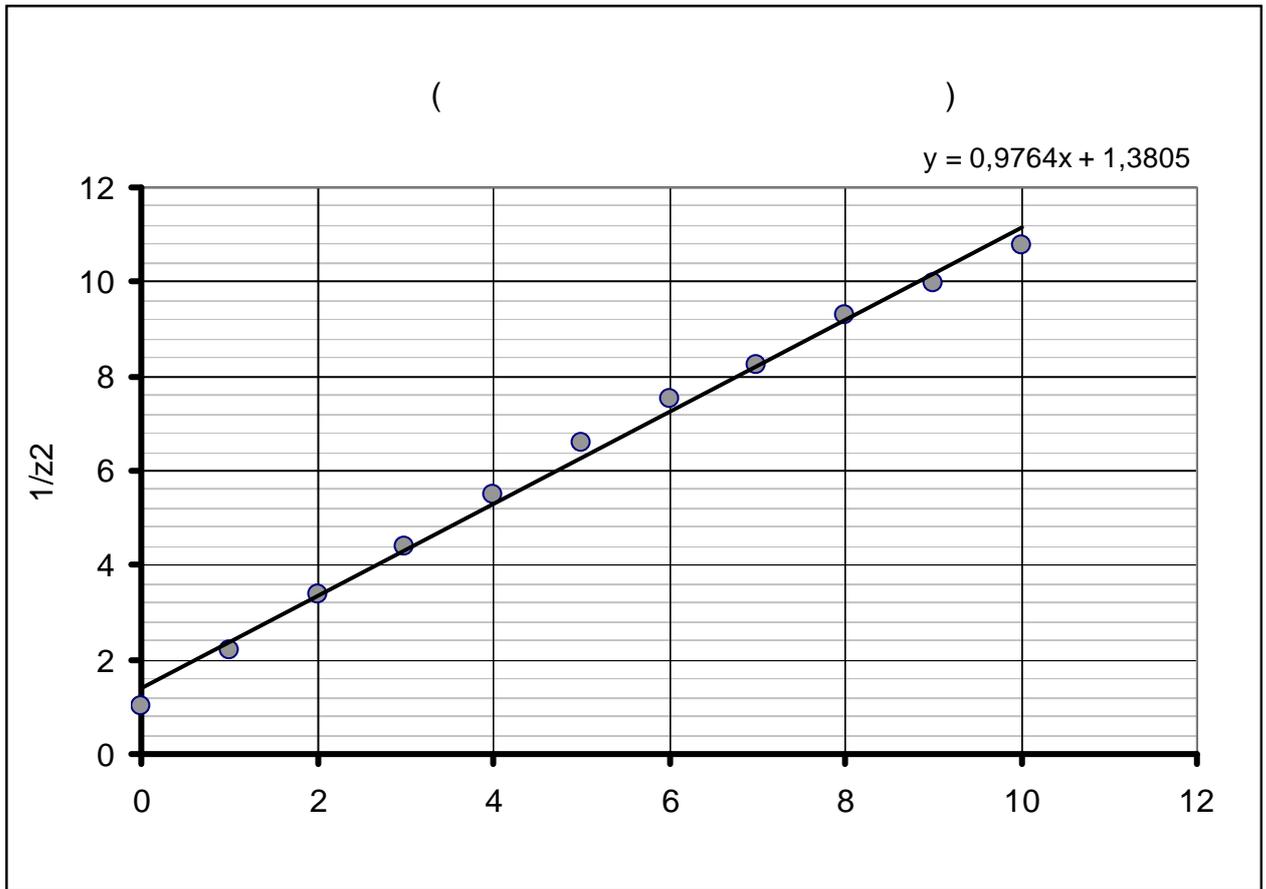
(3).

1.

n	t1	t2	t3	T	z	1/z ²
0	7,89	7,93	7,91	1,582	1,000	1,000
1	5,33	5,37	5,34	1,069	0,676	2,189
2	4,31	4,32	4,27	0,860	0,544	3,384
3	3,75	3,81	3,74	0,753	0,476	4,410
4	3,38	3,39	3,34	0,674	0,426	5,509
5	3,10	3,07	3,08	0,617	0,390	6,581
6	2,88	2,90	2,87	0,577	0,365	7,526
7	2,72	2,80	2,74	0,551	0,348	8,253
8	2,59	2,61	2,58	0,519	0,328	9,303
9	2,52	2,49	2,51	0,501	0,317	9,958
10	2,45	2,40	2,38	0,482	0,305	10,773

5

()



3. M T(r)

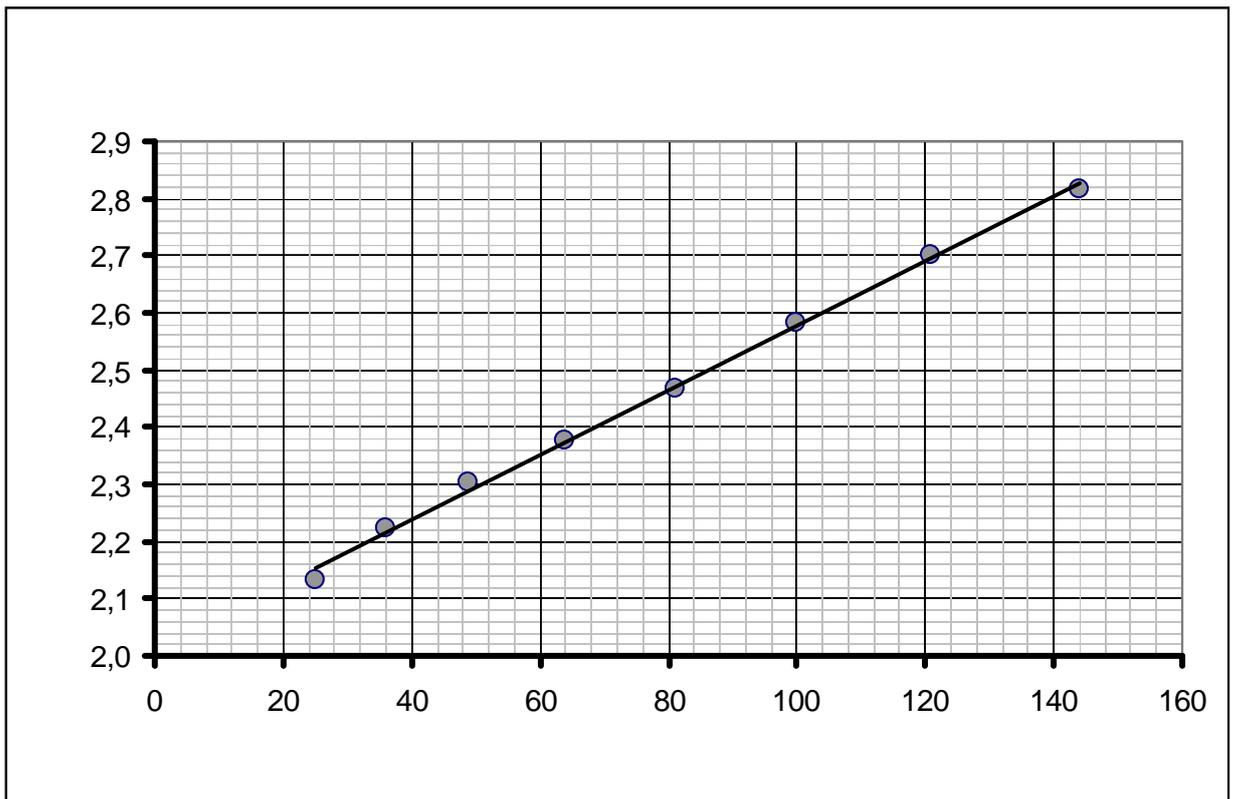
$$E_k = (A + mr^2) \frac{\omega^2}{2}$$

$$\frac{T}{T_0} = \sqrt{\frac{A + mr^2}{A}}$$

$$Z^2 = f(r^2)$$

2.

r,	t1	t2	t3	T	T ²	r ²
12	8,43	8,35	8,39	1,678	2,816	144
11	8,21	8,27	8,18	1,644	2,703	121
10	8,05	8,03	8,02	1,607	2,581	100
9	7,86	7,87	7,84	1,571	2,469	81
8	7,72	7,72	7,69	1,542	2,378	64
7	7,60	7,56	7,61	1,518	2,304	49
6	7,48	7,42	7,47	1,491	2,224	36
5	7,28	7,33	7,29	1,460	2,132	25



4.

$$\eta = \frac{L}{a}$$

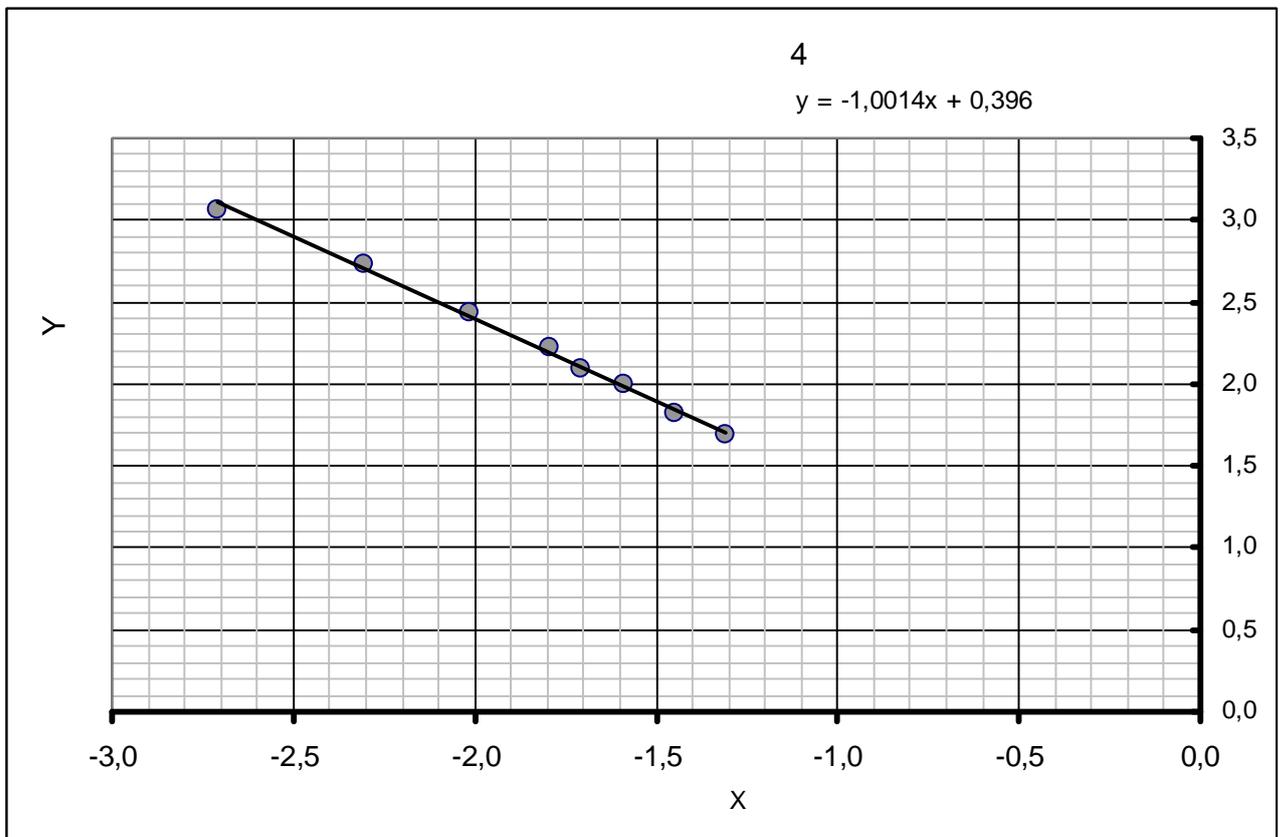
:

$$Y = \ln(T\sqrt{L})$$

$$X = \ln\left(\frac{a}{L}\right)$$

3.
3.

a,	L,	t1	t2	t3	T	a/L	X	Y
5	30	8,43	8,35	8,39	1,678	0,167	-1,792	2,218
5	27,5	7,78	7,75	7,78	1,554	0,182	-1,705	2,098
5	24,5	7,47	7,48	7,41	1,491	0,204	-1,589	1,999
5	21,3	6,73	6,67	6,70	1,340	0,235	-1,449	1,822
5	18,5	6,00	6,42	6,39	1,254	0,270	-1,308	1,685
4	30	10,48	10,47	10,42	2,091	0,133	-2,015	2,438
3	30	14,09	13,97	13,99	2,803	0,100	-2,303	2,731
2	30	19,53	19,50	19,71	3,921	0,102	-2,708	3,067



(. .)
 $\gamma = -1.$