Example 1

The following data was obtained in the analysis of copper using flame atomic absorption sp
Následující data byla získána při analýze mědi pomocí atomové absorpční spektrofotometrie.
Pomocí lineární regrese najděte kalibrační funkci (uveďte a, b, R na čtyři desetinná místa).
Vypočítejte koncentraci mědi pro neznámý vzorek s transmitancí 35.6%.

conc, ppm	**% transmittance**
5.1	78.1
17	43.2
25.5	31.4
34	18.8
42.5	14.5
51	8.7

Example 2

In the potentiometric determination of Pb^{2+} in solution, the following calibration data was co

Pb^{2+}, ppm	**E_{meas}, mV**
15	-338.5
35	-329.8
89	-316.5
150	-312.2
230	-303.7
400	-296.4
500	-295.5
650	-292.5

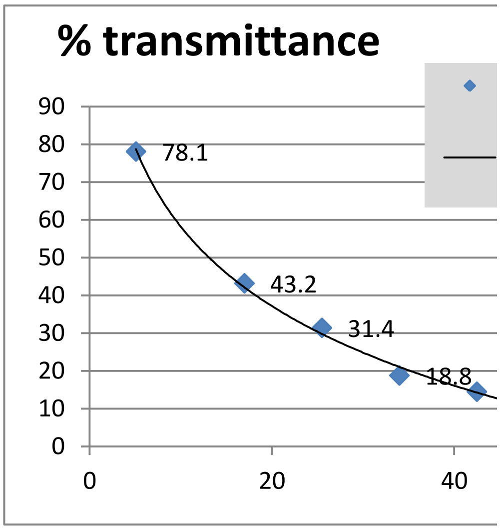
ɔectroscopy.

ɔllected.

Example 1 https://facultystaff.richmond.edu/~cstevens/301/Calibration3.html

The following data were obtained in the analysis of copper using flame atomic absorption s

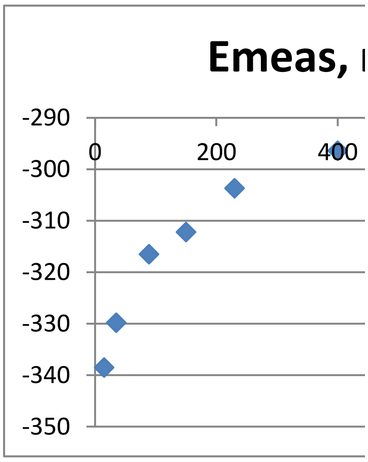
conc, ppm	% transmittance	*A*
5.1	78.1	*0.107349*
17	43.2	*0.364516*
25.5	31.4	*0.50307*
34	18.8	*0.725842*
42.5	14.5	*0.838632*
51	8.7	*1.060481*



Example 2

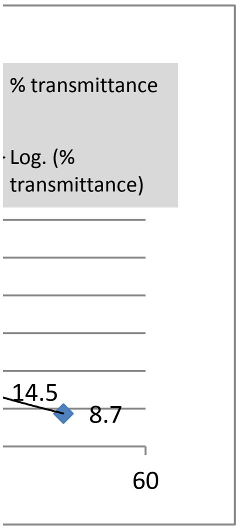
In the potentiometric determination of Pb^{2+} in solution, the following calibration data were c

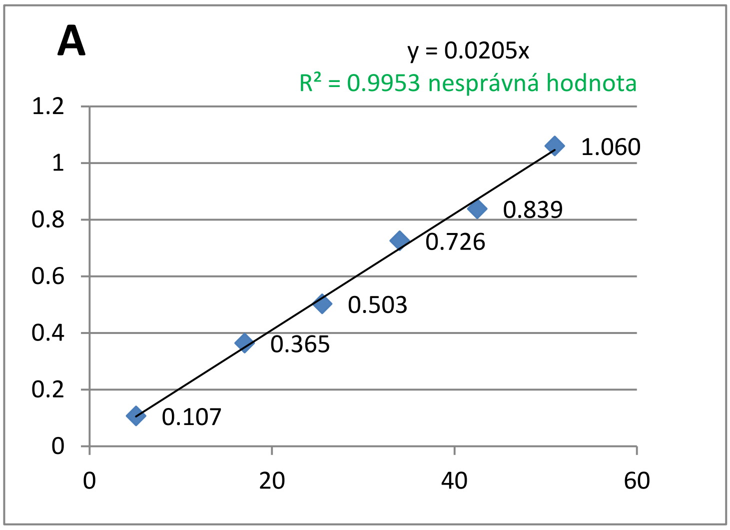
Pb^{2+}, ppm	E_{meas}, mV	*log c*
15	-338.5	*1.1761*
35	-329.8	*1.5441*
89	-316.5	*1.9494*
150	-312.2	*2.1761*
230	-303.7	*2.3617*
400	-296.4	*2.6021*
500	-295.5	*2.6990*
650	-292.5	*2.8129*



spectroscopy.

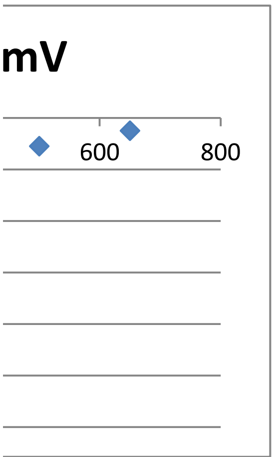
úsek je nevýznamný					35.6
0.020388	0.004988	0.217734	0.020522	0	**21.9**
0.000694	0.022907		0.000291	#N/A	
0.995381	0.026155		0.998994	0.023532	0.9995
861.9527	4	2.776445	4965.226	5	
0.589641	0.002736		2.749477	0.002769	

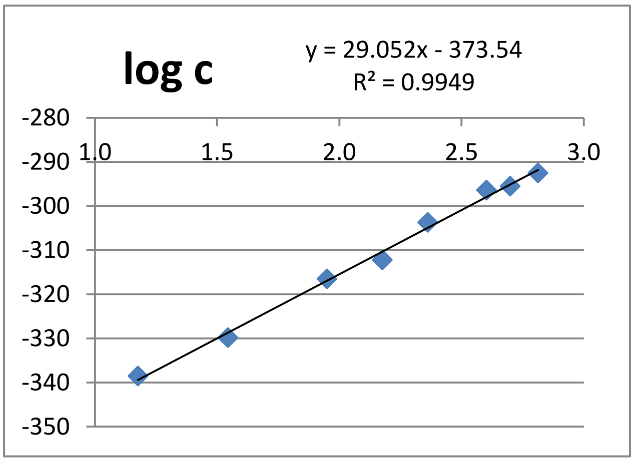




ln
-4.35799
-3.76584
-3.44681
-2.93386
-2.67415
-2.16332

collected.

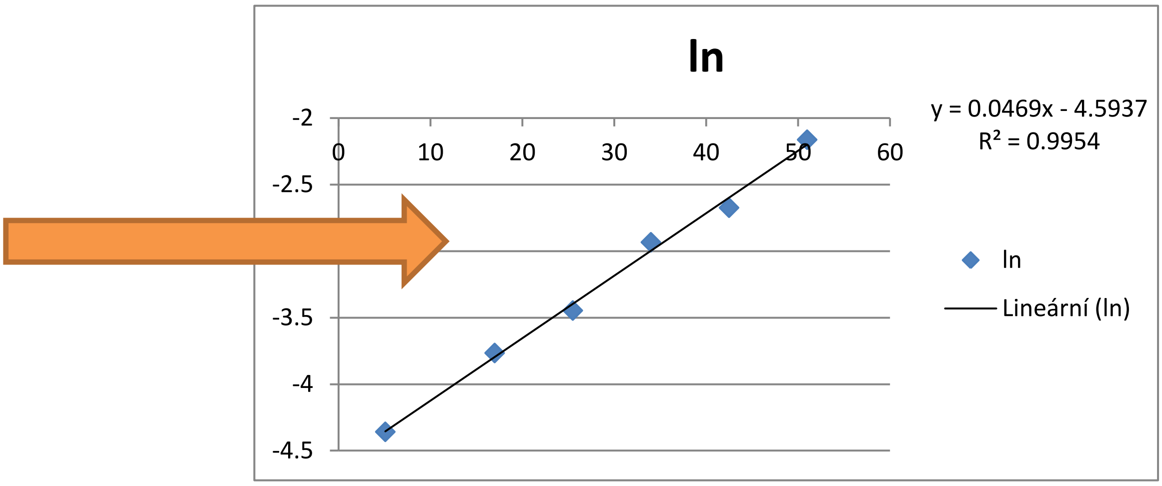




When a blank measurement is obtained during calibration, as in the pre
two possibilities: either include the blank measurement in the regression
from all the calibration and sample measurements. Either way gives the

toto řešení je jen ln-transformace bez znalosti Lambert Beerova zákona:

=T(x)			35.6	=T(x)
=c(x)	0.046945	-4.59369	21.8	=c(x)
	0.001599	0.052745		
=R	0.995381	0.060224		
	861.9527	4		
	3.126215	0.014508		



loglinregrese		-log	2-log
0.954139	98.85813	0.020388	0.004988
0.001599	0.052745		
0.995381	0.060224		
861.9527	4		
3.126215	0.014508		

vious example, there are
ı, or subtract the blank value
same results.

sestrojení grafu Gaussovy funkce

použijte funkci =normd

x	**y**
-3	
-2.8	
-2.6	
-2.4	
-2.2	
-2	
-1.8	
-1.6	
-1.4	
-1.2	
-1	
-0.8	
-0.6	
-0.4	
-0.2	
0	
0.2	
0.4	
0.6	
0.8	
1	
1.2	
1.4	
1.6	
1.8	
2	
2.2	
2.4	
2.6	
2.8	
3	

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

ist

2

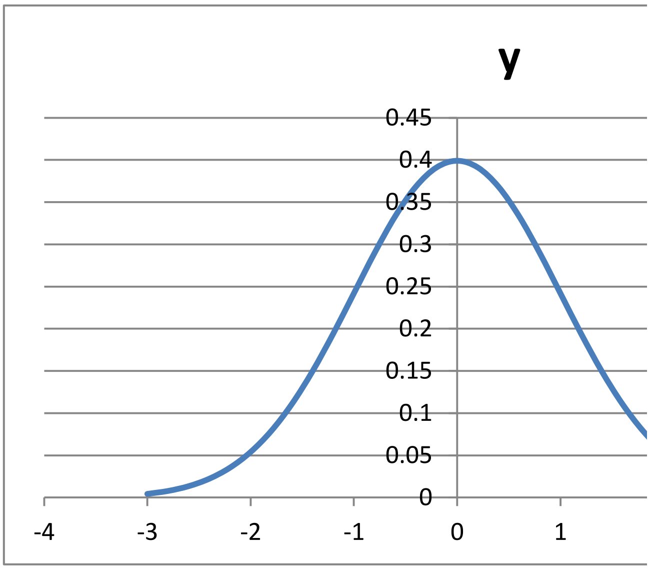
$$,-\infty < x < \infty$$

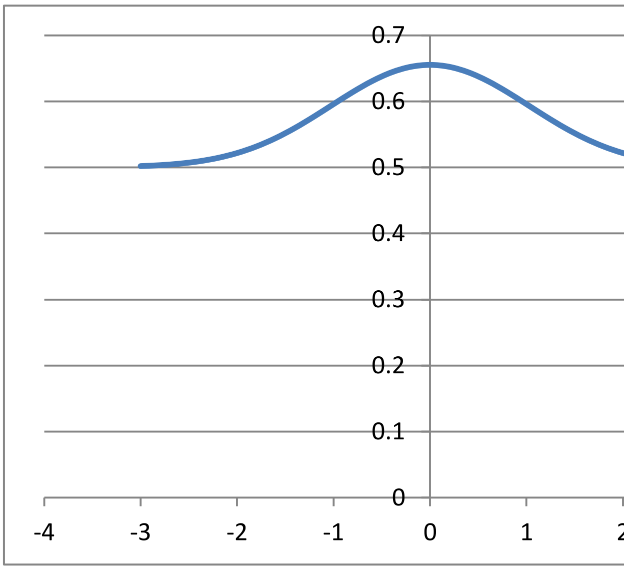
sestrojení grafu Gaussovy funkce

použijte funkci =normd

x	y	
-3	0.004431848	0.501768
-2.8	0.007915452	0.503158
-2.6	0.013582969	0.505419
-2.4	0.02239453	0.508933
-2.2	0.035474593	0.514149
-2	0.053990967	0.521529
-1.8	0.078950158	0.531464
-1.6	0.110920835	0.54416
-1.4	0.149727466	0.55951
-1.2	0.194186055	0.576985
-1	0.241970725	0.595599
-0.8	0.289691553	0.613974
-0.6	0.333224603	0.630518
-0.4	0.36827014	0.643664
-0.2	0.391042694	0.652117
0	0.39894228	0.655032
0.2	0.391042694	0.652117
0.4	0.36827014	0.643664
0.6	0.333224603	0.630518
0.8	0.289691553	0.613974
1	0.241970725	0.595599
1.2	0.194186055	0.576985
1.4	0.149727466	0.55951
1.6	0.110920835	0.54416
1.8	0.078950158	0.531464
2	0.053990967	0.521529
2.2	0.035474593	0.514149
2.4	0.02239453	0.508933
2.6	0.013582969	0.505419
2.8	0.007915452	0.503158
3	0.004431848	0.501768

$$f(x)=\frac{1}{\sigma\sqrt{2\pi}}e^{-\frac{(x-\mu)}{2\sigma^2}}$$

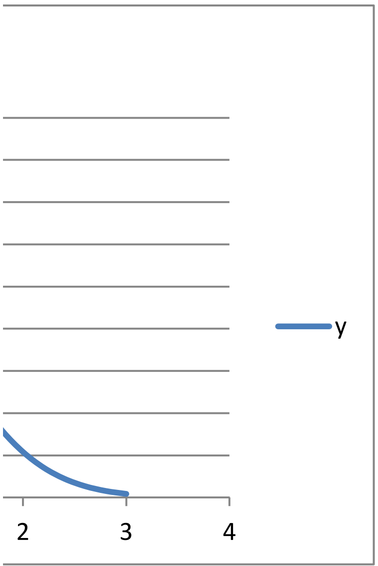


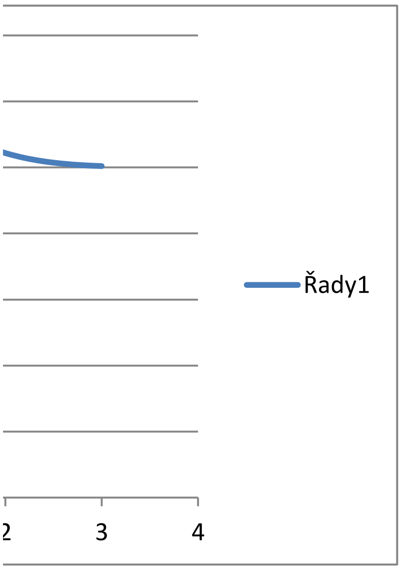


ist

$$2$$

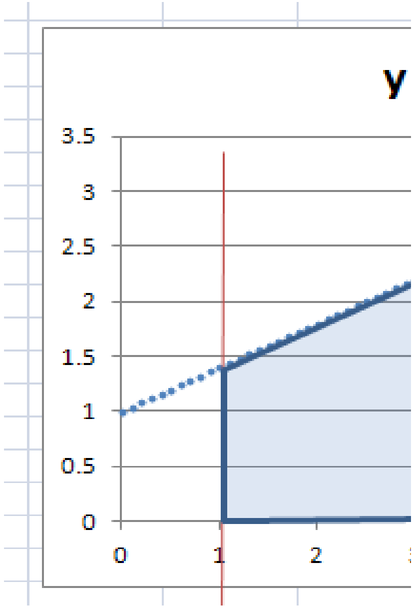
$$, -\infty < x < \infty$$

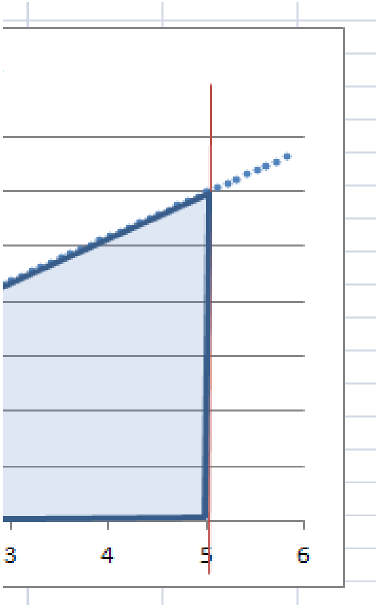




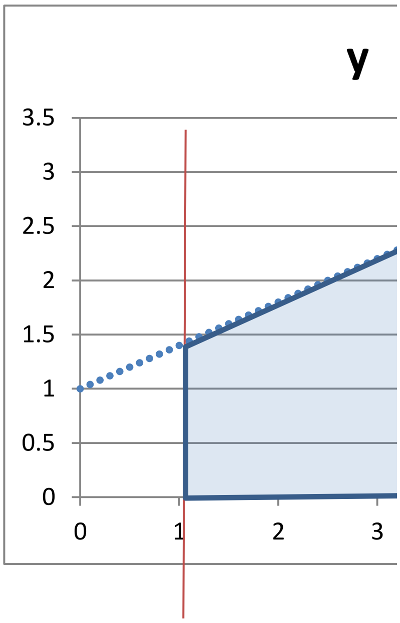
Numerickou integrací zjistěte plochu pod přímkou, která prochází bodem [0,1] a [5,3]
tj. plochu mezi touto přímkou a osou x na intervalu <1,5>

x	y



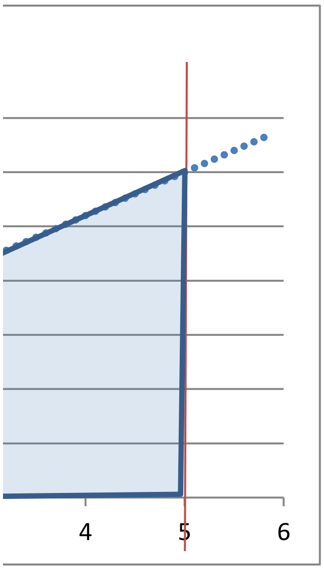

3
4
5
6

Numerickou integrací zjistěte plochu pod přímkou, která prochází bodem [0,1] a [5,3]
tj. plochu mezi touto přímkou a osou x na intervalu <1,5>



x	y		
0	1		
0.1	1.04		
0.2	1.08		
0.3	1.12		
0.4	1.16		
0.5	1.2		
0.6	1.24		
0.7	1.28		
0.8	1.32		
0.9	1.36		
1	1.4		0.14
1.1	1.44	0.144	0.144
1.2	1.48	0.148	0.148
1.3	1.52	0.152	0.152
1.4	1.56	0.156	0.156
1.5	1.6	0.16	0.16
1.6	1.64	0.164	0.164
1.7	1.68	0.168	0.168
1.8	1.72	0.172	0.172
1.9	1.76	0.176	0.176
2	1.8	0.18	0.18
2.1	1.84	0.184	0.184
2.2	1.88	0.188	0.188
2.3	1.92	0.192	0.192
2.4	1.96	0.196	0.196
2.5	2	0.2	0.2
2.6	2.04	0.204	0.204
2.7	2.08	0.208	0.208
2.8	2.12	0.212	0.212
2.9	2.16	0.216	0.216
3	2.2	0.22	0.22
3.1	2.24	0.224	0.224
3.2	2.28	0.228	0.228
3.3	2.32	0.232	0.232
3.4	2.36	0.236	0.236
3.5	2.4	0.24	0.24
3.6	2.44	0.244	0.244
3.7	2.48	0.248	0.248
3.8	2.52	0.252	0.252
3.9	2.56	0.256	0.256
4	2.6	0.26	0.26
4.1	2.64	0.264	0.264
4.2	2.68	0.268	0.268
4.3	2.72	0.272	0.272
4.4	2.76	0.276	0.276
4.5	2.8	0.28	0.28
4.6	2.84	0.284	0.284
4.7	2.88	0.288	0.288
4.8	2.92	0.292	0.292
4.9	2.96	0.296	0.296
5	3	0.3	
5.1	3.04		
5.2	3.08	**8.88**	**8.72**

5.3	3.12
5.4	3.16
5.5	3.2
5.6	3.24
5.7	3.28
5.8	3.32



Y=0.4*X+1

hmotnost

muži	ženy
82	57
87	62
93	58
74	71
68	49
81	56
80	60
67	53
104	71
69	64
75	58
71	49
81	68
96	61
89	54
79	57
109	60
87	47
63	58
75	61
77	67
64	54
59	47
81	64
70	76
69	63
86	67
80	52
81	
91	

	muži	ženy
počet		
aritmet. průměr		
max		
min		
modus		
medián		
rozptyl		
rozptyl výběru		
sm. odchylka		
výběrová sm. odchylka		
histogram		
N		
0.75 percentil		
0.5 percentil		
0.25 percentil		

If n > 20 this table ca

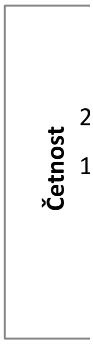
annot be used. A **p** can be computed for U_{obt}, using the normal distribution approximation:

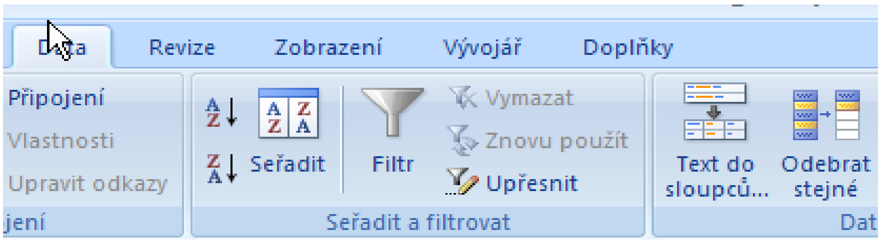
$$z_u = \frac{\left| U_{obt} - \left(\frac{n_1 n_2}{2} \right) \right|}{\sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}}$$

				muži	ženy	
hmotnost			počet			*Slo*
	muži	ženy	aritmet. průměr			
	82	57	max			Stř. hodnot
	87	62	min			Chyba stř.
	93	58	modus			Medián
	74	71	**medián**			Modus
	68	49	rozptyl			Směr. odcł
	81	56	rozptyl výběru			Rozptyl výb
	80	60	sm. odchylka			Špičatost
	67	53	výběrová sm. odchylka			Šikmost
	104	71				#REF!
	69	64	**histogram**			Minimum
	75	58	N			Maximum
	71	49	0.75 percentil			Součet
	81	68	**0.5 percentil**			Počet
	96	61	0.25 percentil			
	89	54				
	79	57				
	109	60				
	87	47				
	63	58				
	75	61				
	77	67				
	64	54				
	59	47				
	81	64				
	70	76				
	69	63				
	86	67				
	80	52				
	81					
	91					

upec1	30	28	
	79.60	59.43	
79.6	109	76	
2.144010636	59	47	
80	81	58	
81	**80**	**59**	
11.74322989	133.31	53.89	
137.9034483	137.90	55.88	
0.316930596	11.55	7.34	
0.574936157	11.74	7.48	
50			60
59			70
109	30	28	80
2388	86.75	64	90
30	**80**	**59**	100
	70.25	54	110

Třídy	*Četnost*
59	1
69	6
79	7
89	11
99	3
Další	2





jsou oba soubory nevýznamně rozdílné? t-test nebo hodnot je d

Mann-Whitneyův test

	rank	**pořadí**	R	U	
47	1	1.5			
47	1	1.5			
49	3	3.5			
49	3	3.5			
52	5	5			
53	6	6			
54	7	7.5			
54	7	7.5			
56	9	9			
57	10	10.5			
57	10	10.5			
58	12	13			
58	12	13			
58	12	13	458	788	
59	15	15	1253	52	**<293**
60	16	16.5			
60	16	16.5			
61	18	18.5			
61	18	18.5			
62	20	20			
63	21	21.5			
63	21	21.5			
64	23	24			
64	23	24			

$U = n$

If n > 2

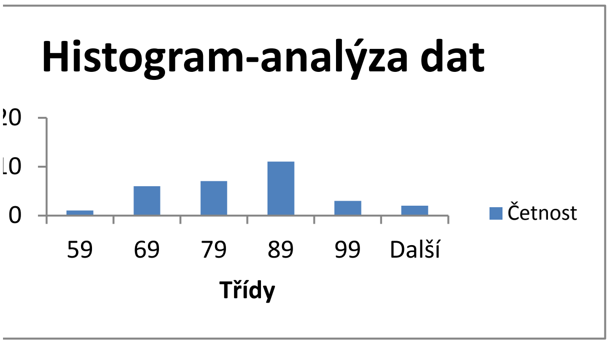
Level c

3
4
5
6
7
8
9
10

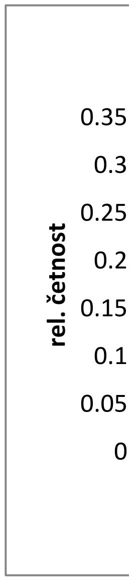
64	23	24
67	26	27
67	26	27
67	26	27
68	29	29.5
68	29	29.5
69	31	31.5
69	31	31.5
70	33	33
71	34	35
71	34	35
71	34	35
74	37	37
75	38	38.5
75	38	38.5
76	40	40
77	41	41
79	42	42
80	43	43.5
80	43	43.5
81	45	46.5
81	45	46.5
81	45	46.5
81	45	46.5
82	49	49
86	50	50
87	51	51.5
87	51	51.5
89	53	53
91	54	54
93	55	55
96	56	56
104	57	57
109	58	58

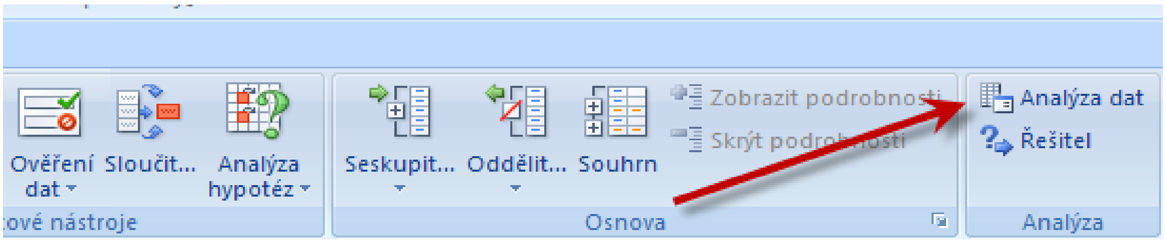
Size of the smallest sample (n_1)

11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30



Třídy	Četnost	rel.četnost
0-60	1	0.033333
61-70	7	0.233333
71-80	8	0.266667
81-90	9	0.3
91-100	3	0.1
101-110	2	0.066667
Další	0	





ost, Moorův test není určen pro tak velké počty…

$$n_1 n_2 + \frac{n_1(n_1+1)}{2} - R_1$$

0 this table cannot be used. A **p** can be computed for U_{obt}, using the normal distribution approximatic

$$z_u = \frac{\left| U_{obt} - \left(\frac{n_1 n_2}{2} \right) \right|}{\sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}}$$

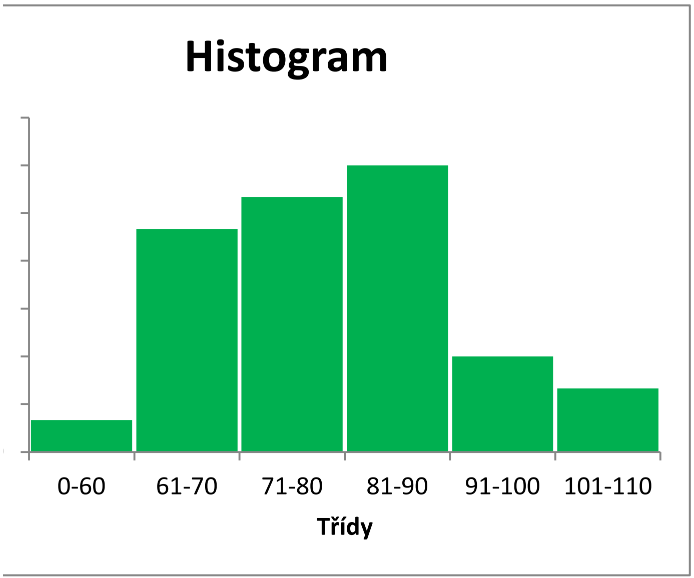
Critical Values for the Mann-Whitney U-Test

of significance: 5% (P = 0.05)

Size of the largest sample (n_2)

5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	13	13
1	2	3	4	4	5	6	7	8	9	10	11	11	12	13	14	15	16	17	17	18	19	20	21	22	23
2	3	5	6	7	8	9	11	12	13	14	15	17	18	19	20	22	23	24	25	27	28	29	30	32	33
	5	6	8	10	11	13	14	16	17	19	21	22	24	25	27	29	30	32	33	35	37	38	40	42	43
		8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54
			13	15	17	19	22	24	26	29	31	34	36	38	41	43	45	48	50	53	55	57	60	62	65
				17	20	23	26	28	31	34	37	39	42	45	48	50	53	56	59	62	64	67	70	73	76
					23	26	29	33	36	39	42	45	48	52	55	58	61	64	67	71	74	77	80	83	87

						30	33	37	40	44	47	51	55	58	62	65	69	73	76	80	83	87	90	94	98
							37	41	45	49	53	57	61	65	69	73	77	81	85	89	93	97	101	105	109
								45	50	54	59	63	67	72	76	80	85	89	94	98	102	107	111	116	120
									55	59	64	67	74	78	83	88	93	98	102	107	112	118	122	127	131
										64	70	75	80	85	90	96	101	106	111	117	122	125	132	138	143
											75	81	86	92	98	103	109	115	120	126	132	138	143	149	154
												87	93	99	105	111	117	123	129	135	141	147	154	160	166
													99	106	112	119	125	132	138	145	151	158	164	171	177
														113	119	126	133	140	147	154	161	168	175	182	189
															127	134	141	149	156	163	171	178	186	193	200
																142	150	157	165	173	181	188	196	204	212
																	158	166	174	182	191	199	207	215	223
																		175	183	192	200	209	218	226	235
																			192	201	210	219	228	238	247
																				211	220	230	239	249	258
																					230	240	250	260	270
																						250	261	271	282
																							272	282	293
																								294	305
																									317



ɔn:

z

5.73

2. Bylo vybráno 10 polí stejné kvality. Na 4 polích byl aplikován nový růstový s byla ponechána bez aplikace. Poté byla oseta pšenicí a sledoval se hektarová v s aplikací stimulátoru byly získány hektarové výnosy 51, 67, 56, 63 a na polích be 48, 44, 53, 50 q/ha. Zjistěte, zda aplikace stimulátoru zvýší výnosy.

stimulátor, ostatní
výnos. Na polích
z aplikace 45, 54,

$$U = n_1 n_2 + \frac{n_1(n_1+1)}{2} - R_1$$

Critical values of U for α equal to 5%

$n_1 \backslash n_2$	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1																
2							0	0	0	0	1	1	1	1	1	2
3				0	1	1	2	2	3	3	4	4	5	5	6	6
4			0	1	2	3	4	4	5	6	7	8	9	10	11	11
5		0	1	2	3	5	6	7	8	9	11	12	13	14	15	17
6		1	2	3	5	6	8	10	11	13	14	16	17	19	21	22
7		1	3	5	6	8	10	12	14	16	18	20	22	24	26	28
8	0	2	4	6	8	10	13	15	17	19	22	24	26	29	31	34
9	0	2	4	7	10	12	15	17	20	23	26	28	31	34	37	39
10	0	3	5	8	11	14	17	20	23	26	29	33	36	39	42	45
11	0	3	6	9	13	16	19	23	26	30	33	37	40	44	47	51
12	1	4	7	11	14	18	22	26	29	33	37	41	45	49	53	57
13	1	4	8	12	16	20	24	28	33	37	41	45	50	54	59	63
14	1	5	9	13	17	22	26	31	36	40	45	50	55	59	64	67
15	1	5	10	14	19	24	29	34	39	44	49	54	59	64	70	75
16	1	6	11	15	21	26	31	37	42	47	53	59	64	70	75	81
17	2	6	11	17	22	28	34	39	45	51	57	63	67	75	81	87
18	2	7	12	18	24	30	36	42	48	55	61	67	74	80	86	93
19	2	7	13	19	25	32	38	45	52	58	65	72	78	85	92	99
20	2	8	13	20	27	34	41	48	55	62	69	76	83	90	98	105

18	19	20
2	2	2
7	7	8
12	13	13
18	19	20
24	25	27
30	32	34
36	38	41
42	45	48
48	52	55
55	58	62
61	65	69
67	72	76
74	78	83
80	85	90
86	92	98
93	99	105
99	106	112
106	113	119
112	119	127

2. Bylo vybráno 10 polí stejné kvality. Na 4 polích byl aplikován nový růstový s
byla ponechána bez aplikace. Poté byla oseta pšenicí a sledoval se hektarová v
s aplikací stimulátoru byly získány hektarové výnosy 51, 67, 56, 63 a na polích be
48, 44, 53, 50 q/ha. Zjistěte, zda aplikace stimulátoru zvýší výnosy.

		pořadí	R	N	U		
stimulátor	51	6					
	67	1					
	56	3					
	63	2	12	4	22		
bez	45	9					
	54	4					
	48	8					
	44	10					
	53	5					
	50	7	43	6	2	=	2

x	R		
59.25	16		
49	10		
u= 0.394231		>	0.319

stimulátor, ostatní
výnos. Na polích
z aplikace 45, 54,

Mann-Whitney U-test

$$U = n_1 n_2 + \frac{n_1(n_1+1)}{2} - R_1$$

$n_1 \backslash n_2$	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Critical values of U for α equal to 5%																	
1																	
2							0	0	0	0	1	1	1	1	1	2	
3				0	1	1	2	2	3	3	4	4	5	5	6	6	
4			0	1	2	3	4	4	5	6	7	8	9	10	11	11	
5		0	1	2	3	5	6	7	8	9	11	12	13	14	15	17	
6		1	2	3	5	6	8	10	11	13	14	16	17	19	21	22	
7		1	3	5	6	8	10	12	14	16	18	20	22	24	26	28	
8	0	2	4	6	8	10	13	15	17	19	22	24	26	29	31	34	
9	0	2	4	7	10	12	15	17	20	23	26	28	31	34	37	39	
10	0	3	5	8	11	14	17	20	23	26	29	33	36	39	42	45	
11	0	3	6	9	13	16	19	23	26	30	33	37	40	44	47	51	
12	1	4	7	11	14	18	22	26	29	33	37	41	45	49	53	57	
13	1	4	8	12	16	20	24	28	33	37	41	45	50	54	59	63	
14	1	5	9	13	17	22	26	31	36	40	45	50	55	59	64	67	
15	1	5	10	14	19	24	29	34	39	44	49	54	59	64	70	75	
16	1	6	11	15	21	26	31	37	42	47	53	59	64	70	75	81	
17	2	6	11	17	22	28	34	39	45	51	57	63	67	75	81	87	
18	2	7	12	18	24	30	36	42	48	55	61	67	74	80	86	93	
19	2	7	13	19	25	32	38	45	52	58	65	72	78	85	92	99	1
20	2	8	13	20	27	34	41	48	55	62	69	76	83	90	98	105	1

Moorův test

$$U = \frac{|\bar{x}_A - \bar{x}_B|}{R_A + R_B}$$

Tabulka 14. Kritické hodnoty Moorova rozdělení U_α

n_A	n_B	α			n_A	n_B	α	
		0,100	0,050	0,010			0,100	0,050
2	2	1,161	1,714	3,958	4	4	0,322	0,407
	3	0,693	0,915	1,557		5	0,282	0,353
	4	0,556	0,732	1,242		6	0,256	0,319
	5	0,478	0,619	1,008		7	0,237	0,294
	6	0,429	0,549	0,865				
	7	0,396	0,502	0,776	5	5	0,247	0,307
						6	0,224	0,277
3	3	0,487	0,635	1,050		7	0,208	0,256
	4	0,398	0,511	0,814				
	5	0,339	0,429	0,660	6	6	0,203	0,250
	6	0,311	0,391	0,590		7	0,188	0,240
	7	0,288	0,360	0,536				
					7	7	0,174	0,213

18	19	20
2	2	2
7	7	8
12	13	13
18	19	20
24	25	27
30	32	34
36	38	41
42	45	48
48	52	55
55	58	62
61	65	69
67	72	76
74	78	83
80	85	90
86	92	98
93	99	105
99	106	112
106	113	119
112	119	127

0,010
0,620
0,528
0,469
0,429
0,450
0,402
0,368
0,359
0,329
0,301

4. Ve 3 vzorcích ropy byl metodou AAS stanovován obsah Ni s následujícími výsledky
Kruskal-Wallisova testu rozhodněte, zda se obsah Ni ve vzorcích významně liší.

Vzorek			Ni	(ppm)		
1	14,2	16,8	19,1	15,5	16,0	15,9
2	14,5	20,0	18,0	15,4	16,1	17,7
3	18,3	20,1	17,7	17,9	19,3	16,9

γ. Pomocí

$$H = \frac{12}{N(N+1)} \sum_{i=1}^{k} \frac{R_i^2}{n_i} - 3(N+1)$$

6	4	3	5.610
6	4	4	5.681
6	5	1	4.990
6	5	2	5.338
6	5	3	5.602
6	5	4	5.661
6	5	5	5.729
6	6	1	4.945
6	6	2	5.410
6	6	3	5.625
6	6	4	5.725
6	6	5	5.765
6	6	6	5.801
7	7	7	5.819
8	8	8	5.805

4. Ve 3 vzorcích ropy byl metodou AAS stanovován obsah Ni s následujícími v
Kruskal-Wallisova testu rozhodněte, zda se obsah Ni ve vzorcích významně liší.

Vzorek			Ni	(ppm)		
1	14,2	16,8	19,1	15,5	16,0	15,9
2	14,5	20,0	18,0	15,4	16,1	17,7
3	18,3	20,1	17,7	17,9	19,3	16,9

vzorek č.

1	14.2	16.8	19.1	15.5	16	15.9
2	15.4	20	18	15.4	16.1	17.7
3	18.3	20.1	17.7	17.9	19.3	16.9

	rank	pořadí		
14.2	18	18		
16.8	11	11		
19.1	4	4		
15.5	15	15		
16	13	13		
15.9	14	14	75	937.5
15.4	16	**16.5**		
20	2	2		
18	6	6		
15.4	16	**16.5**		
16.1	12	12		
17.7	8	**8.5**	61.5	630.375
18.3	5	5		
20.1	1	1		
17.7	8	**8.5**		
17.9	7	7		
19.3	3	3		
16.9	10	10	34.5	198.375

H=	**4.974**	**<**	**5.801**

N= 18

ýsledky. Pomocí

$$H = \frac{12}{N(N+1)} \sum_{i=1}^{k} \frac{R_i^2}{n_i} - 3(N+1)$$

6	4	3	5.610
6	4	4	5.681
6	5	1	4.990
6	5	2	5.338
6	5	3	5.602
6	5	4	5.661
6	5	5	5.729
6	6	1	4.945
6	6	2	5.410
6	6	3	5.625
6	6	4	5.725
6	6	5	5.765
6	6	6	5.801
7	7	7	5.819
8	8	8	5.805

najdi odlehlé hodnoty pomocí Grubbsova testu

číslo měření	koncentrace Pb [ng/ml]
1	37.9
2	22.8
3	13.4
4	31.6
5	50.8
6	20.2
7	9.5
8	26.7
9	76.1
10	22.0

Kritické hodnoty Grubbsova T-rozd

n	kritické hodnoty *T*	
3	1,412	
4	1,689	
5	1,869	
6	1,996	
7	2,093	
8	2,172	
9	2,237	
10	2,294	
11	2,343	

lělení (α=0,05)

n	kritické hodnoty T
12	2,387
13	2,426
14	2,461
15	2,493
16	2,523
17	2,551
18	2,557
19	2,600
20	2,623

najdi odlehlé hodnoty pomocí Grubbsova testu

číslo měření	koncentrace Pb [ng/ml]		T	
1	37.9	*9.5*	1.149766	ok
2	22.8	*13.4*	*0.94217*	ok
3	13.4	*20.2*	*0.58021*	ok
4	31.6	*22.0*	*0.48439*	ok
5	50.8	*22.8*	*0.44181*	ok
6	20.2	*26.7*	*0.23421*	ok
7	9.5	*31.6*	*0.02661*	ok
8	26.7	*37.9*	*0.36196*	ok
9	76.1	*50.8*	*1.04863*	ok
10	22.0	*76.1*	2.395346	outlier

18.78643127 S

31.1 X

Kritické ho

n	k
3	
4	
5	
6	
7	
8	
9	
10	
11	

dnoty Grubbsova T-rozdělení (α=0,05)

ritické hodnoty *T*	*n*	kritické hodnoty *T*
1,412	12	2,387
1,689	13	2,426
1,869	14	2,461
1,996	15	2,493
2,093	16	2,523
2,172	17	2,551
2,237	18	2,557
2,294	19	2,600
2,343	20	2,623

1	37.9
2	22.8
3	13.4
4	31.6
5	50.8
6	20.2
7	9.5
8	26.7
9	76.1
	19.5428
	32.1

9.5	1.157005	ok
13.4	0.957443	ok
20.2	0.609488	ok
22.0	0.517383	ok
22.8	0.476447	ok
26.7	0.276885	ok
31.6	0.026153	ok
37.9	0.296216	ok
50.8	0.956306	ok

S
X

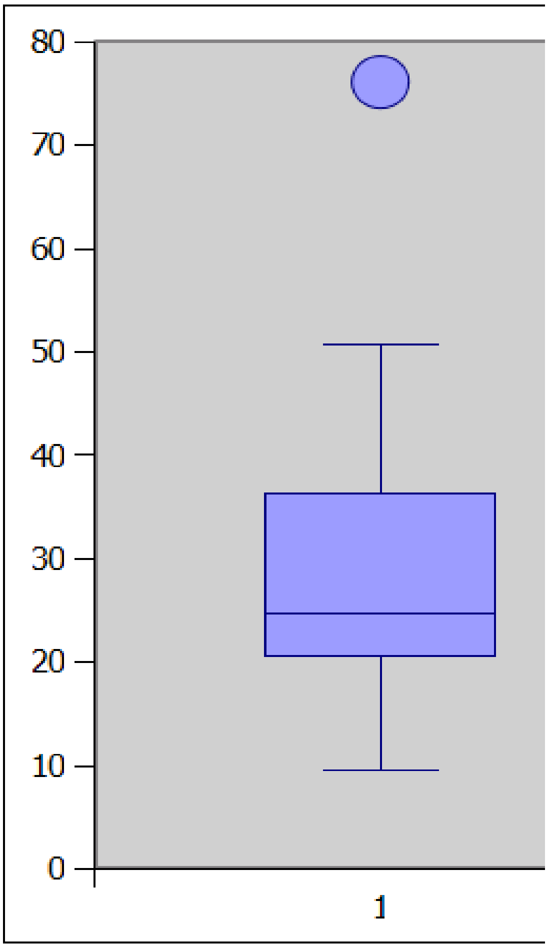
najdi odlehlé hodnoty pomocí metody vnitřních hradeb

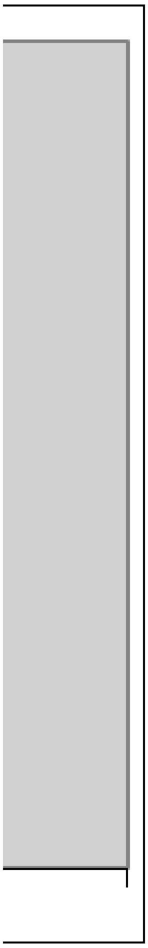
číslo měření	koncentrace Pb [ng/ml]
1	37.9
2	22.8
3	13.4
4	31.6
5	50.8
6	20.2
7	9.5
8	26.7
9	76.1
10	22.0

najdi odlehlé hodnoty pomocí metody vnitřních hradeb

číslo měření	koncentrace Pb [ng/ml]
1	37.9
2	22.8
3	13.4
4	31.6
5	50.8
6	20.2
7	9.5
8	26.7
9	76.1
10	22.0

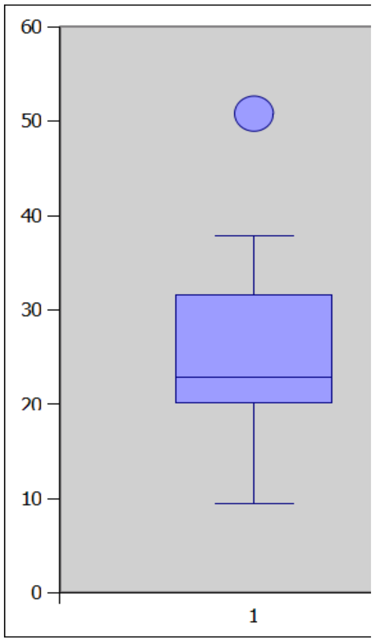
-2.8625	20.65	q1
59.8375	36.325	q3
	15.675	Rq

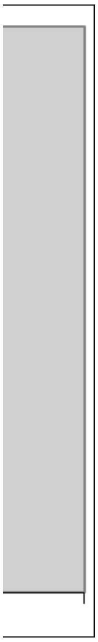




1	37.9
2	22.8
3	13.4
4	31.6
5	50.8
6	20.2
7	9.5
8	26.7
9	22.0

3.1	20.2	q1
48.7	31.6	q3
	11.4	Rq





1	37.9
2	22.8
3	13.4
4	31.6
5	20.2
6	9.5
7	26.7
8	22.0

4.3625	18.5	q1
42.0625	27.925	q3
	9.425	Rq