

DAVID MALONE.

Nóta—Gan na Táblaí seo a thabhairt amach as an Halla Scrúduithe

I GCÓIR FEIDHMEANNA OIFIGIÚLA

6790832

TÁBLAÍ MATAMAITICE

Ext 9.

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SCRÚDUITHE POIBLÍ
AG AN ROINN OIDEACHAIS AGUS
AG COIMISINÉIRÍ NA STÁTSEIRBHÍSE

MATHEMATICS TABLES

APPROVED FOR USE AT THE
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BAILE ÁTHA CLIATH
ARNA FHOILSIÚ AG OIFIG AN ISOLÁTHAIR.

Le ceannach díreach ón
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nó trí aon díoltóir leabhar.

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CLÁR

	Leathanach Page	
Tomhas (Aonaid S I)	4-5	Measure (S I units)
Foirmlí Tomhais	6-7	Mensuration Formulae
Céimeanna—Raidiain	8	Degrees—Radians
Foirmlí Triantánachta	9	Trigonometric Formulae
Logartaim (go bun 10)	10-11	Logarithms (to base 10)
Frithlogartaim	12-13	Anti-logarithms
Comhshínis	14-15	Cosines
Sínis	16-17	Sines
Tadhlaithé	18-19	Tangents
Uimhreacha Cearnacha	20-21	Squares
Fréamhacha Cearnacha	22-25	Square Roots
Deilíní	26-27	Reciprocals
Logartaim Nádurtha	28-29	Natural Logarithms
e^x	30-31	e^x
Cosh x	32	Cosh x
Sinh x	33	Sinh x
Staitistic	34-35	Statistics
Táblaí Staitistice	36-38	Statistical Tables
Matamaitic Fheidhmeach	39-40	Applied Mathematics
Foirmlí Difreála agus Suimeála	41-42	Differentiation and Integration Formulae
Tábla Athraithe Impiriúil Méadrach	43	Imperial Metric Conversion Tables
Táblaí Ceimice	44-46	Chemistry Tables

TOMHAS (Aonaid S I)

FAD

Aonad Bunata: Méadar
 10 milliméadar (mm) = 1 ceintiméadar (cm)
 10 cm = 1 deiciméadar (dm)
 10 dm = 1 méadar (m)
 1000 m = 1 ciliméadar (km)

ACHAR

Aonad S.I.: Méadar Cearnaithe
 100 m² = 1 ár (a)
 100 ár = 1 heicteár (ha)

TOIRT

Aonad S.I.: Méadar Ciúbach
 1 liotar (l) = 1000 cm³ = 1 dm³

MAIS

Aonad bunata: Cileagram
 1000 gram (g) = 1 cileagram (kg)
 1000 kg = 1 tona (t)

Baintear feidhm as na réimíreanna annseo thíos chun iolraithe agus fo-iolraithe a ghiniúint:

An chuideog faoina méadaítear an t-aonad	Réimír	Siombail	An chuideog faoina méadaítear an t-aonad	Réimír	Siombail
10 ¹²	teiri- teirea-	T	10 ⁻²	ceinti- ceintea-	c
10 ⁹	gigi- gigea-	G	10 ⁻³	milli- millea-	m
10 ⁶	meigi- meigea-	M	10 ⁻⁶	micri- micrea-	μ
10 ³	cili- cilea-	k	10 ⁻⁹	nanai- nana-	n
10 ²	heicti- heictea-	h	10 ⁻¹²	pici- picea-	p
10	deacai- deaca-	da	10 ⁻¹⁵	feimti- feimtea-	f
10 ⁻¹	deici- deicea-	d	10 ⁻¹⁸	atai- ata-	a

Déantar comhartha na réimíre a chomhnascadh le comhartha an aonaid atá ag gabháil léi chun comhartha aonaid nua a dhéanamh, i. ciliméadar (km), milleagram (mg).

MEASURE (S I units)

LENGTH

Base Unit: Metre
 10 millimetres (mm) = 1 centimetre (cm)
 10 cm = 1 decimetre (dm)
 10 dm = 1 metre (m)
 1000 m = 1 kilometre (km)

AREA

S.I. Unit: Square Metre
 100 m² = 1 are (a)
 100 ares = 1 hectare (ha)

VOLUME

S.I. Unit: Cubic Metre
 1 litre (l) = 1000 cm³ = 1 dm³

MASS

Base Unit: Kilogramme
 1000 grammes (g) = 1 kilogramme (kg)
 1000 kg = 1 tonne (t)

Multiples and submultiples are formed by means of the prefixes listed below:

Factor by which unit is multiplied	Prefix	Symbol	Factor by which unit is multiplied	Prefix	Symbol
10 ¹²	tera-	T	10 ⁻²	centi-	c
10 ⁹	giga-	G	10 ⁻³	milli-	m
10 ⁶	mega-	M	10 ⁻⁶	micro-	μ
10 ³	kilo-	k	10 ⁻⁹	nano-	n
10 ²	hecto-	h	10 ⁻¹²	pico-	p
10	deca-	da	10 ⁻¹⁵	femto-	f
10 ⁻¹	deci-	d	10 ⁻¹⁸	atto-	a

The symbol for a prefix is considered to be combined with the unit symbol to which it is attached forming a new unit symbol, e.g.

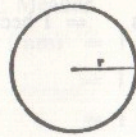
kilometre (km), milligram (mg).

FOIRMLÍ TOMHAIS

FAID CUARANNA

Ciorcal, gath r

Fad = $2\pi r$



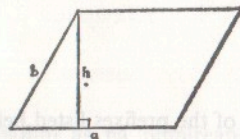
Circle, radius r

Length = $2\pi r$

ACHAIR DROMCHLAÍ

Comhthrombaráin

Achar = ah



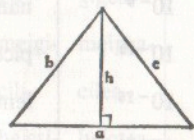
Area = ah

Triantáin

Achar = $\frac{1}{2}ah$

= $\sqrt{s(s-a)(s-b)(s-c)}$

áit a bhfuil $s = \frac{a+b+c}{2}$



Area = $\frac{1}{2}ah$

= $\sqrt{s(s-a)(s-b)(s-c)}$

where $s = \frac{a+b+c}{2}$

MENSURATION FORMULAE

Length of curves

Stua ciorcail, gath r

Fad = $r\theta$ (θ i raidiain)



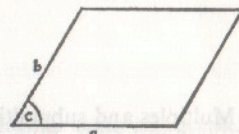
Arc of circle, radius r

Length = $r\theta$ (θ in radians)

AREAS OF SURFACES

Parallelograms

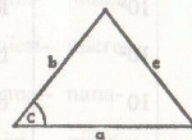
Achar = $ab \sin C$



Area = $ab \sin C$

Triangles

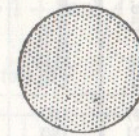
Achar = $\frac{1}{2}ab \sin C$



Area = $\frac{1}{2}ab \sin C$

Diosca, gath r

Achar = πr^2



Disc, radius r

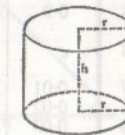
Area = πr^2

DROMCHLAÍ AGUS TOIRTEANNA

Sorcóir, gath r

Achar an dromchla chuarraigh = $2\pi rh$

Toirt = $\pi r^2 h$



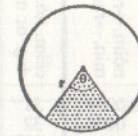
Cylinder, radius r

Area of curved surface = $2\pi rh$

Volume = $\pi r^2 h$

Teascóg diosca, gath r

Achar = $\frac{1}{2}r^2\theta$ (θ i raidiain)



Sector of a disc, radius r

Area = $\frac{1}{2}r^2\theta$, (θ in radians)

SURFACES AND VOLUMES

Cón, gath r

Achar an dromchla chuarraigh = πrl

Toirt = $\frac{1}{3}\pi r^2 h$



Cone, radius r

Curved surface area = πrl

Volume = $\frac{1}{3}\pi r^2 h$

Sféar, gath r

Achar an dromchla = $4\pi r^2$

Toirt = $\frac{4}{3}\pi r^3$



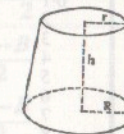
Sphere, radius r

Area of surface = $4\pi r^2$

Volume = $\frac{4}{3}\pi r^3$

Frustam chóin

Toirt = $\frac{1}{3}\pi h(R^2 + Rr + r^2)$



Frustum of a cone

Volume = $\frac{1}{3}\pi h(R^2 + Rr + r^2)$

$\pi \approx 3.142$	$\frac{1}{\pi} \approx 0.3183$	$\sqrt{\pi} \approx 1.773$	$\frac{4}{3}\pi \approx 4.189$
$\log_{10} \pi \approx 0.4971$	$\log_{10} \frac{1}{\pi} \approx 1.5029$	$\log_{10} \sqrt{\pi} \approx 0.2486$	$\log_{10} \frac{4}{3}\pi \approx 0.6221$

céim. nó. nóim. deg. or min.	céim. → raid. deg. → rad.	nóim. nó. nóim. min. → rad.	céim. nó. nóim. deg. or min.	céim. → raid. deg. → rad.	nóim. nó. nóim. min. → rad.	céimeanna degrees	céim. → raid. deg. → rad.	céimeanna degrees	céim. → raid. deg. → rad.
1	0-0175	0-0003	31	0-5411	0-0090	61	1-0647	100	1-7453
2	0349	0006	32	5585	0093	62	0821	180	3-1416
3	0524	0009	33	5760	0096	63	0996	200	3-4907
4	0698	0012	34	5934	0099	64	1170	270	4-7124
5	0873	0015	35	6109	0102	65	1345	300	5-2360
6	1047	0018	36	6283	0105	66	1519	360	6-2832
7	1222	0020	37	6458	0108	67	1694	450	7-8540
8	1396	0023	38	6632	0111	68	1868	540	9-4248
9	1571	0026	39	6807	0113	69	2043	630	10-996
10	1745	0029	40	6981	0116	70	2217	720	12-566
11	0-1920	0-0032	41	0-7156	0-0119	71	1-2392	0-1	0-0018
12	2094	0035	42	7330	0122	72	2566	0-2	0035
13	2269	0038	43	7505	0125	73	2741	0-3	0052
14	2444	0041	44	7679	0128	74	2915	0-4	0070
15	2618	0044	45	7854	0131	75	3090	0-5	0087
16	2793	0047	46	8029	0134	76	3265	0-6	0105
17	2967	0050	47	8203	0137	77	3439	0-7	0122
18	3142	0052	48	8378	0140	78	3614	0-8	0140
19	3316	0055	49	8552	0143	79	3788	0-9	0157
20	3491	0058	50	8727	0145	80	3963		
21	0-3665	0-0061	51	0-8901	0-0148	81	1-4137	0-01	0-0002
22	3840	0064	52	9076	0151	82	4312	0-02	0004
23	4014	0067	53	9250	0154	83	4486	0-03	0005
24	4189	0070	54	9425	0157	84	4661	0-04	0007
25	4363	0073	55	9599	0160	85	4835	0-05	0009
26	4538	0076	56	9774	0163	86	5010	0-06	0011
27	4712	0079	57	9948	0166	87	5184	0-07	0012
28	4887	0081	58	1-0123	0169	88	5359	0-08	0014
29	5062	0084	59	1-0297	0172	89	5533	0-09	0016
30	5236	0087	60	1-0472	0175	90	5708		

raid. rad.	céim. deg.	raid. rad.	céim. deg.	raid. rad.	céim. deg.	raid. rad.	céim. deg.
0-001	0-0573	0-01	0-5730	0-1	5-7296	1	57-296
2	1146	2	1-1459	2	11-459	2	114-59
3	1719	3	1-7189	3	17-189	3	171-89
4	2292	4	2-2918	4	22-918	4	229-18
5	2865	5	2-8648	5	28-648	5	286-48
6	3438	6	3-4378	6	34-378	6	343-78
7	4011	7	4-0107	7	40-107	7	401-07
8	4584	8	4-5836	8	45-836	8	458-36
9	5157	9	5-1566	9	51-566	9	515-66

$\cos^2 A + \sin^2 A = 1$

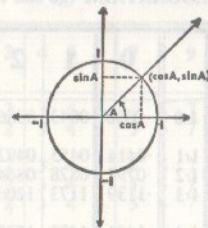
$\sec A = \frac{1}{\cos A}$

$\tan A = \frac{\sin A}{\cos A}$

$\operatorname{cosec} A = \frac{1}{\sin A}$

$\sec^2 A = 1 + \tan^2 A = \frac{1}{\cos^2 A}$

$\cot A = \frac{1}{\tan A}$

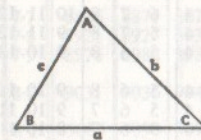


A	0	π	$\frac{\pi}{2}$	$\frac{\pi}{3}$	$\frac{\pi}{4}$	$\frac{\pi}{6}$
cos A	1	-1	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$
sin A	0	0	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$
tan A	0	0	gan sainmhíniú not defined	$\sqrt{3}$	1	$\frac{1}{\sqrt{3}}$

$\cos(-A) = \cos A$

$\sin(-A) = -\sin A$

$\tan(-A) = -\tan A$



Foirmle an tsín: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
Sine formula:

Foirmle an chomhshinis: $a^2 = b^2 + c^2 - 2bc \cos A$
Cosine formula:

$\cos(A+B) = \cos A \cos B - \sin A \sin B$

$\cos 2A = \cos^2 A - \sin^2 A$

$\sin(A+B) = \sin A \cos B + \cos A \sin B$

$\sin 2A = 2 \sin A \cos A$

$\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$

$\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$

$\cos 2A = \frac{1 - \tan^2 A}{1 + \tan^2 A}$

$\sin 2A = \frac{2 \tan A}{1 + \tan^2 A}$

$\cos^2 A = \frac{1}{2}(1 + \cos 2A)$

$\sin^2 A = \frac{1}{2}(1 - \cos 2A)$

$2 \cos A \cos B = \cos(A+B) + \cos(A-B)$

$2 \sin A \cos B = \sin(A+B) + \sin(A-B)$

$2 \sin A \sin B = \cos(A-B) - \cos(A+B)$

$2 \cos A \sin B = \sin(A+B) - \sin(A-B)$

$\cos A + \cos B = 2 \cos \frac{A+B}{2} \cos \frac{A-B}{2}$

$\cos A - \cos B = -2 \sin \frac{A+B}{2} \sin \frac{A-B}{2}$

$\sin A + \sin B = 2 \sin \frac{A+B}{2} \cos \frac{A-B}{2}$

$\sin A - \sin B = 2 \cos \frac{A+B}{2} \sin \frac{A-B}{2}$

$e^{in\theta} = (\cos \theta + i \sin \theta)^n = \cos n\theta + i \sin n\theta$

	0	1	2	3	4	5	6	7	8	9	1 2 3	4 5 6	7 8 9
1-0	-0000	0043	0086	0128	0170	0212	0253	0294	0334	0374	4 8 12	17 21 25	29 33 37
1-1	-0414	0453	0492	0531	0569	0607	0645	0682	0719	0755	4 8 11	15 19 23	26 30 34
1-2	-0792	0828	0864	0899	0934	0969	1004	1038	1072	1106	3 7 10	14 17 21	24 28 31
1-3	-1139	1173	1206	1239	1271	1303	1335	1367	1399	1430	3 6 10	13 16 19	23 26 29
1-4	-1461	1492	1523	1553	1584	1614	1644	1673	1703	1732	3 6 9	12 15 18	21 24 27
1-5	-1761	1790	1818	1847	1875	1903	1931	1959	1987	2014	3 6 8	11 14 17	20 22 25
1-6	-2041	2068	2095	2122	2148	2175	2201	2227	2253	2279	3 5 8	11 13 16	18 21 24
1-7	-2304	2330	2355	2380	2405	2430	2455	2480	2504	2529	2 5 7	10 12 15	17 20 22
1-8	-2553	2577	2601	2625	2648	2672	2695	2718	2742	2765	2 5 7	9 12 14	16 19 21
1-9	-2788	2810	2833	2856	2878	2900	2923	2945	2967	2989	2 4 7	9 11 13	16 18 20
2-0	-3010	3032	3054	3075	3096	3118	3139	3160	3181	3201	2 4 6	8 11 13	15 17 19
2-1	-3222	3243	3263	3284	3304	3324	3345	3365	3385	3404	2 4 6	8 10 12	14 16 18
2-2	-3424	3444	3464	3483	3502	3522	3541	3560	3579	3598	2 4 6	8 10 12	14 15 17
2-3	-3617	3636	3655	3674	3692	3711	3729	3747	3766	3784	2 4 6	7 9 11	13 15 17
2-4	-3802	3820	3838	3856	3874	3892	3909	3927	3945	3962	2 4 5	7 9 11	12 14 16
2-5	-3979	3997	4014	4031	4048	4065	4082	4099	4116	4133	2 3 5	7 9 10	12 14 15
2-6	-4150	4166	4183	4200	4216	4232	4249	4265	4281	4298	2 3 5	7 8 10	11 13 15
2-7	-4314	4330	4346	4362	4378	4393	4409	4425	4440	4456	2 3 5	6 8 9	11 13 14
2-8	-4472	4487	4502	4518	4533	4548	4564	4579	4594	4609	2 3 5	6 8 9	11 12 14
2-9	-4624	4639	4654	4669	4683	4698	4713	4728	4742	4757	1 3 4	6 7 9	10 12 13
3-0	-4771	4786	4800	4814	4829	4843	4857	4871	4886	4900	1 3 4	6 7 9	10 11 13
3-1	-4914	4928	4942	4955	4969	4983	4997	5011	5024	5038	1 3 4	6 7 8	10 11 12
3-2	-5051	5065	5079	5092	5105	5119	5132	5145	5159	5172	1 3 4	5 7 8	9 11 12
3-3	-5185	5198	5211	5224	5237	5250	5263	5276	5289	5302	1 3 4	5 6 8	9 10 12
3-4	-5315	5328	5340	5353	5366	5378	5391	5403	5416	5428	1 3 4	5 6 8	9 10 11
3-5	-5441	5453	5465	5478	5490	5502	5514	5527	5539	5551	1 2 4	5 6 7	9 10 11
3-6	-5563	5575	5587	5599	5611	5623	5635	5647	5658	5670	1 2 4	5 6 7	8 10 11
3-7	-5682	5694	5705	5717	5729	5740	5752	5763	5775	5786	1 2 3	5 6 7	8 9 10
3-8	-5798	5809	5821	5832	5843	5855	5866	5877	5888	5899	1 2 3	5 6 7	8 9 10
3-9	-5911	5922	5933	5944	5955	5966	5977	5988	5999	6010	1 2 3	4 5 7	8 9 10
4-0	-6021	6031	6042	6053	6064	6075	6085	6096	6107	6117	1 2 3	4 5 6	8 9 10
4-1	-6128	6138	6149	6160	6170	6180	6191	6201	6212	6222	1 2 3	4 5 6	7 8 9
4-2	-6232	6243	6253	6263	6274	6284	6294	6304	6314	6325	1 2 3	4 5 6	7 8 9
4-3	-6335	6345	6355	6365	6375	6385	6395	6405	6415	6425	1 2 3	4 5 6	7 8 9
4-4	-6435	6444	6454	6464	6474	6484	6493	6503	6513	6522	1 2 3	4 5 6	7 8 9
4-5	-6532	6542	6551	6561	6571	6580	6590	6599	6609	6618	1 2 3	4 5 6	7 8 9
4-6	-6628	6637	6646	6656	6665	6675	6684	6693	6702	6712	1 2 3	4 5 6	7 7 8
4-7	-6721	6730	6739	6749	6758	6767	6776	6785	6794	6803	1 2 3	4 5 5	6 7 8
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	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
0	1-0000	1-000	1-000	1-000	1-000	1-000	9999	9999	9999	9999	Dealagh. /Subtract.				
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41	.7547	7536	7524	7513	7501	7490	7478	7466	7455	7443	2	4	6	8	10
42	.7431	7420	7408	7396	7385	7373	7361	7349	7337	7325	2	4	6	8	10
43	.7314	7302	7290	7278	7266	7254	7242	7230	7218	7206	2	4	6	8	10
44	.7193	7181	7169	7157	7145	7133	7120	7108	7096	7083	2	4	6	8	10

Ciallaíonn an cló trom go bhfuil athrú san slánuimhir.
The black type indicates that the integer changes.

	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
45°	.7071	7059	7046	7034	7022	7009	6997	6984	6972	6959	2	4	6	8	10
46	.6947	6934	6921	6909	6896	6884	6871	6858	6845	6833	2	4	6	8	11
47	.6820	6807	6794	6782	6769	6756	6743	6730	6717	6704	2	4	6	9	11
48	.6691	6678	6665	6652	6639	6626	6613	6600	6587	6574	2	4	7	9	11
49	.6561	6547	6534	6521	6508	6494	6481	6468	6455	6441	2	4	7	9	11
50	.6428	6414	6401	6388	6374	6361	6347	6334	6320	6307	2	4	7	9	11
51	.6293	6280	6266	6252	6239	6225	6211	6198	6184	6170	2	5	7	9	11
52	.6157	6143	6129	6115	6101	6088	6074	6060	6046	6032	2	5	7	9	12
53	.6018	6004	5990	5976	5962	5948	5934	5920	5906	5892	2	5	7	9	12
54	.5878	5864	5850	5835	5821	5807	5793	5779	5764	5750	2	5	7	9	12
55	.5736	5721	5707	5693	5678	5664	5650	5635	5621	5606	2	5	7	10	12
56	.5592	5577	5563	5548	5534	5519	5505	5490	5476	5461	2	5	7	10	12
57	.5446	5432	5417	5402	5388	5373	5358	5344	5329	5314	2	5	7	10	12
58	.5299	5284	5270	5255	5240	5225	5210	5195	5180	5165	2	5	7	10	12
59	.5150	5135	5120	5105	5090	5075	5060	5045	5030	5015	3	5	8	10	13
60	.5000	4985	4970	4955	4939	4924	4909	4894	4879	4863	3	5	8	10	13
61	.4848	4833	4818	4802	4787	4772	4756	4741	4726	4710	3	5	8	10	13
62	.4695	4679	4664	4648	4633	4617	4602	4586	4571	4555	3	5	8	10	13
63	.4540	4524	4509	4493	4478	4462	4446	4431	4415	4399	3	5	8	10	13
64	.4384	4368	4352	4337	4321	4305	4289	4274	4258	4242	3	5	8	11	13
65	.4226	4210	4195	4179	4163	4147	4131	4115	4099	4083	3	5	8	11	13
66	.4067	4051	4035	4019	4003	3987	3971	3955	3939	3923	3	5	8	11	13
67	.3907	3891	3875	3859	3843	3827	3811	3795	3778	3762	3	5	8	11	13
68	.3746	3730	3714	3697	3681	3665	3649	3633	3616	3600	3	5	8	11	14
69	.3584	3567	3551	3535	3518	3502	3486	3469	3453	3437	3	5	8	11	14
70	.3420	3404	3387	3371	3355	3338	3322	3305	3289	3272	3	5	8	11	14
71	.3256	3239	3223	3206	3190	3173	3156	3140	3123	3107	3	6	8	11	14
72	.3090	3074	3057	3040	3024	3007	2990	2974	2957	2940	3	6	8	11	14
73	.2924	2907	2890	2874	2857	2840	2823	2807	2790	2773	3	6	8	11	14
74	.2756	2740	2723	2706	2689	2672	2656	2639	2622	2605	3	6	8	11	14
75	.2588	2571	2554	2538	2521	2504	2487	2470	2453	2436	3	6	8	11	14
76	.2419	2402	2385	2368	2351	2334	2317	2300	2284	2267	3	6	8	11	14
77	.2250	2233	2215	2198	2181	2164	2147	2130	2113	2096	3	6	9	11	14
78															

	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
0°	.0000	0017	0035	0052	0070	0087	0105	0122	0140	0157	3	6	9	12	15
1	.0175	0192	0209	0227	0244	0262	0279	0297	0314	0332	3	6	9	12	15
2	.0349	0366	0384	0401	0419	0436	0454	0471	0488	0506	3	6	9	12	15
3	.0523	0541	0558	0576	0593	0610	0628	0645	0663	0680	3	6	9	12	15
4	.0698	0715	0732	0750	0767	0785	0802	0819	0837	0854	3	6	9	12	14
5	.0872	0889	0906	0924	0941	0958	0976	0993	1011	1028	3	6	9	12	14
6	.1045	1063	1080	1097	1115	1132	1149	1167	1184	1201	3	6	9	12	14
7	.1219	1236	1253	1271	1288	1305	1323	1340	1357	1374	3	6	9	12	14
8	.1392	1409	1426	1444	1461	1478	1495	1513	1530	1547	3	6	9	12	14
9	.1564	1582	1599	1616	1633	1650	1668	1685	1702	1719	3	6	9	11	14
10	.1736	1754	1771	1788	1805	1822	1840	1857	1874	1891	3	6	9	11	14
11	.1908	1925	1942	1959	1977	1994	2011	2028	2045	2062	3	6	9	11	14
12	.2079	2096	2113	2130	2147	2164	2181	2198	2215	2233	3	6	9	11	14
13	.2250	2267	2284	2300	2317	2334	2351	2368	2385	2402	3	6	8	11	14
14	.2419	2436	2453	2470	2487	2504	2521	2538	2554	2571	3	6	8	11	14
15	.2588	2605	2622	2639	2656	2672	2689	2706	2723	2740	3	6	8	11	14
16	.2756	2773	2790	2807	2823	2840	2857	2874	2890	2907	3	6	8	11	14
17	.2924	2940	2957	2974	2990	3007	3024	3040	3057	3074	3	6	8	11	14
18	.3090	3107	3123	3140	3156	3173	3190	3206	3223	3239	3	6	8	11	14
19	.3256	3272	3289	3305	3322	3338	3355	3371	3387	3404	3	5	8	11	14
20	.3420	3437	3453	3469	3486	3502	3518	3535	3551	3567	3	5	8	11	14
21	.3584	3600	3616	3633	3649	3665	3681	3697	3714	3730	3	5	8	11	14
22	.3746	3762	3778	3795	3811	3827	3843	3859	3875	3891	3	5	8	11	13
23	.3907	3923	3939	3955	3971	3987	4003	4019	4035	4051	3	5	8	11	13
24	.4067	4083	4099	4115	4131	4147	4163	4179	4195	4210	3	5	8	11	13
25	.4226	4242	4258	4274	4289	4305	4321	4337	4352	4368	3	5	8	11	13
26	.4384	4399	4415	4431	4446	4462	4478	4493	4509	4524	3	5	8	10	13
27	.4540	4555	4571	4586	4602	4617	4633	4648	4664	4679	3	5	8	10	13
28	.4695	4710	4726	4741	4756	4772	4787	4802	4818	4833	3	5	8	10	13
29	.4848	4863	4879	4894	4909	4924	4939	4955	4970	4985	3	5	8	10	13
30	.5000	5015	5030	5045	5060	5075	5090	5105	5120	5135	3	5	8	10	13
31	.5150	5165	5180	5195	5210	5225	5240	5255	5270	5284	2	5	7	10	12
32	.5299	5314	5329	5344	5358	5373	5388	5402	5417	5432	2	5	7	10	12
33	.5446	5461	5476	5490	5505	5519	5534	5548	5563	5577	2	4	7	10	12
34	.5592	5606	5621	5635	5650	5664	5678	5693	5707	5721	2	5	7	10	12
35	.5736	5750	5764	5779	5793	5807	5821	5835	5850	5864	2	5	7	9	12
36	.5878	5892	5906	5920	5934	5948	5962	5976	5990	6004	2	5	7	9	12
37	.6018	6032	6046	6060	6074	6088	6101	6115	6129	6143	2	5	7	9	12
38	.6157	6170	6184	6198	6211	6225	6239	6252	6266	6280	2	5	7	9	11
39	.6293	6307	6320	6334	6347	6361	6374	6388	6401	6414	2	4	7	9	11
40	.6428	6441	6455	6468	6481	6494	6508	6521	6534	6547	2	4	7	9	11
41	.6561	6574	6587	6600	6613	6626	6639	6652	6665	6678	2	4	7	9	11
42	.6691	6704	6717	6730	6743	6756	6769	6782	6794	6807	2	4	6	9	11
43	.6820	6833	6845	6858	6871	6884	6896	6909	6921	6934	2	4	6	8	11
44	.6947	6959	6972	6984	6997	7009	7022	7034	7046	7059	2	4	6	8	10

	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
45°	.7071	7083	7096	7108	7120	7133	7145	7157	7169	7181	2	4	6	8	10
46	.7193	7206	7218	7230	7242	7254	7266	7278	7290	7302	2	4	6	8	10
47	.7314	7325	7337	7349	7361	7373	7385	7396	7408	7420	2	4	6	8	10
48	.7431	7443	7455	7466	7478	7490	7501	7513	7524	7536	2	4	6	8	10
49	.7547	7559	7570	7581	7593	7604	7615	7627	7638	7649	2	4	6	8	9
50	.7660	7672	7683	7694	7705	7716	7727	7738	7749	7760	2	4	6	8	9
51	.7771	7782	7793	7804	7815	7826	7837	7848	7859	7869	2	4	5	7	9
52	.7880	7891	7902	7912	7923	7934	7944	7955	7965	7976	2	4	5	7	9
53	.7986	7997	8007	8018	8028	8039	8049	8059	8070	8080	2	3	5	7	9
54	.8090	8100	8111	8121	8131	8141	8151	8161	8171	8181	2	3	5	7	8
55	.8192	8202	8211	8221	8231	8241	8251	8261	8271	8281	2	3	5	7	8
56	.8290	8300	8310	8320	8329	8339	8348	8358	8368	8377	2	3	5	6	8
57	.8387	8396	8406	8415	8425	8434	8443	8453	8462	8471	2	3	5	6	8
58	.8480	8490	8499	8508	8517	8526	8536	8545	8554	8563	2	3	5	6	8
59	.8572	8581	8590	8599	8607	8616	8625	8634	8643	8652	1	3	4	6	7
60	.8660	8669	8678	8686	8695	8704	8712	8721	8729	8738	1	3	4	6	7
61	.8746	8755	8763	8771	8780	8788	8796	8805	8813	8821	1	3	4	6	7
62	.8829	8838	8846	8854	8862	8870	8878	8886	8894	8902	1	3	4	5	7
63	.8910	8918	8926	8934	8942	8949	8957	8965	8973	8980	1	3	4	5	6
64	.8988	8996	9003	9011	9018	9026	9033	9041	9048	9056	1	3	4	5	6
65	.9063	9070	9078	9085	9092	9100	9107	9114	9121	9128	1	2	4	5	6
66	.9135	9143	9150	9157	9164	9171	9178	9184	9191	9198	1	2	3	5	6
67	.9205	9212	9219	9225	9232	9239	9245	9252	9259	9265	1	2	3	4	6
68	.9272	9278	9285	9291	9298	9304	9311	9317	9323	9330	1	2	3	4	5
69	.9336	9342	9348	9354	9361	9367	9373	9379	9385	9391	1	2	3	4	5
70	.9397	9403	9409	9415	9421	9426	9432	9438	9444	9449	1	2	3	4	5
71	.9455	9461	9466	9472	9478	9483	9489	9494	9500	9505	1	2	3	4	5
72	.9511	9516	9521	9527	9532	9537	9542	9548	9553	9558	1	2	3	4	4
73	.9563	9568	9573	9578	9583	9588	9593	9598	9603	9608	1	2	2	3	4
74	.9613	9617	9622	9627	9632	9636	9641	9646	9650	9655	1	2	2	3	4
75	.9659	9664	9668	9673	9677	9681	9686	9690	9694	9699	1	1	2	3	4
76	.9703	9707	9711	9715	9720	9724	9728	9732	9736	9740	1	1	2	3	3
77	.9744	9748	9751	9755	9759	9763	9767	9770	9774	9778	1	1	2	3	3
78	.9781	9785	9789	9792	9796	9799	9803	9806	9810	9813					

	0	1	2	3	4	5	6	7	8	9	Meán Difríochtaí Mean Differences								
											1 2 3			4 5 6			7 8 9		
											1	2	3	4	5	6	7	8	9
10	3-162	3-178	3-194	3-209	3-225	3-240	3-256	3-271	3-286	3-302	2	3	5	6	8	9	11	12	14
11	3-317	3-332	3-347	3-362	3-376	3-391	3-406	3-421	3-435	3-450	1	3	4	6	7	9	10	12	13
12	3-464	3-479	3-493	3-507	3-521	3-536	3-550	3-564	3-578	3-592	1	3	4	6	7	8	10	11	13
13	3-606	3-619	3-633	3-647	3-661	3-674	3-688	3-701	3-715	3-728	1	3	4	5	7	8	10	11	12
14	3-742	3-755	3-768	3-782	3-795	3-808	3-821	3-834	3-847	3-860	1	3	4	5	7	8	9	11	12
15	3-873	3-886	3-899	3-912	3-924	3-937	3-950	3-962	3-975	3-987	1	3	4	5	6	8	9	10	11
16	4-000	4-012	4-025	4-037	4-050	4-062	4-074	4-087	4-099	4-111	1	2	4	5	6	7	9	10	11
17	4-123	4-135	4-147	4-159	4-171	4-183	4-195	4-207	4-219	4-231	1	2	4	5	6	7	8	10	11
18	4-243	4-254	4-266	4-278	4-290	4-301	4-313	4-324	4-336	4-347	1	2	3	5	6	7	8	9	10
19	4-359	4-370	4-382	4-393	4-405	4-416	4-427	4-438	4-450	4-461	1	2	3	5	6	7	8	9	10
20	4-472	4-483	4-494	4-506	4-517	4-528	4-539	4-550	4-561	4-572	1	2	3	4	6	7	8	9	10
21	4-583	4-593	4-604	4-615	4-626	4-637	4-648	4-658	4-669	4-680	1	2	3	4	5	6	8	9	10
22	4-690	4-701	4-712	4-722	4-733	4-743	4-754	4-764	4-775	4-785	1	2	3	4	5	6	7	8	9
23	4-796	4-806	4-817	4-827	4-837	4-848	4-858	4-868	4-879	4-889	1	2	3	4	5	6	7	8	9
24	4-899	4-909	4-919	4-930	4-940	4-950	4-960	4-970	4-980	4-990	1	2	3	4	5	6	7	8	9
25	5-000	5-010	5-020	5-030	5-040	5-050	5-060	5-070	5-079	5-089	1	2	3	4	5	6	7	8	9
26	5-099	5-109	5-119	5-128	5-138	5-148	5-158	5-167	5-177	5-187	1	2	3	4	5	6	7	8	9
27	5-196	5-206	5-215	5-225	5-235	5-244	5-254	5-263	5-273	5-282	1	2	3	4	5	6	7	8	9
28	5-292	5-301	5-310	5-320	5-329	5-339	5-348	5-357	5-367	5-376	1	2	3	4	5	6	7	7	8
29	5-385	5-394	5-404	5-413	5-422	5-431	5-441	5-450	5-459	5-468	1	2	3	4	5	5	6	7	8
30	5-477	5-486	5-495	5-505	5-514	5-523	5-532	5-541	5-550	5-559	1	2	3	4	4	5	6	7	8
31	5-568	5-577	5-586	5-595	5-604	5-612	5-621	5-630	5-639	5-648	1	2	3	3	4	5	6	7	8
32	5-657	5-666	5-675	5-683	5-692	5-701	5-710	5-718	5-727	5-736	1	2	3	3	4	5	6	7	8
33	5-745	5-753	5-762	5-771	5-779	5-788	5-797	5-805	5-814	5-822	1	2	3	3	4	5	6	7	8
34	5-831	5-840	5-848	5-857	5-865	5-874	5-882	5-891	5-899	5-908	1	2	3	3	4	5	6	7	8
35	5-916	5-925	5-933	5-941	5-950	5-958	5-967	5-975	5-983	5-992	1	2	2	3	4	5	6	7	8
36	6-000	6-008	6-017	6-025	6-033	6-042	6-050	6-058	6-066	6-075	1	2	2	3	4	5	6	7	7
37	6-083	6-091	6-099	6-107	6-116	6-124	6-132	6-140	6-148	6-156	1	2	2	3	4	5	6	7	7
38	6-164	6-173	6-181	6-189	6-197	6-205	6-213	6-221	6-229	6-237	1	2	2	3	4	5	6	6	7
39	6-245	6-253	6-261	6-269	6-277	6-285	6-293	6-301	6-309	6-317	1	2	2	3	4	5	6	6	7
40	6-325	6-332	6-340	6-348	6-356	6-364	6-372	6-380	6-387	6-395	1	2	2	3	4	5	6	6	7
41	6-403	6-411	6-419	6-427	6-434	6-442	6-450	6-458	6-465	6-473	1	2	2	3	4	5	5	6	7
42	6-481	6-488	6-496	6-504	6-512	6-519	6-527	6-535	6-542	6-550	1	2	2	3	4	5	5	6	7
43	6-557	6-565	6-573	6-580	6-588	6-595	6-603	6-611	6-618	6-626	1	2	2	3	4	5	5	6	7
44	6-633	6-641	6-648	6-656	6-663	6-671	6-678	6-686	6-693	6-701	1	2	2	3	4	5	5	6	7
45	6-708	6-716	6-723	6-731	6-738	6-745	6-753	6-760	6-768	6-775	1	1	2	3	4	4	5	6	7
46	6-782	6-790	6-797	6-804	6-812	6-819	6-826	6-834	6-841	6-848	1	1	2	3	4	4	5	6	7
47	6-856	6-863	6-870	6-877	6-885	6-892	6-899	6-907	6-914	6-921	1	1	2	3	4	4	5	6	7
48	6-928	6-935	6-943	6-950	6-957	6-964	6-971	6-979	6-986	6-993	1	1	2	3	4	4	5	6	6
49	7-000	7-007	7-014	7-021	7-029	7-036	7-043	7-050	7-057	7-064	1	1	2	3	4	4	5	6	6
50	7-071	7-078	7-085	7-092	7-099	7-106	7-113	7-120	7-127	7-134	1	1	2	3	4	4	5	6	6
51	7-141	7-148	7-155	7-162	7-169	7-176	7-183	7-190	7-197	7-204	1	1	2	3	4	4	5	6	6
52	7-211	7-218	7-225	7-232	7-239	7-246	7-253	7-259	7-266	7-273	1	1	2	3	3	4	5	6	6
53	7-280	7-287	7-294	7-301	7-308	7-314	7-321	7-328	7-335	7-342	1	1	2	3	3	4	5	6	6
54	7-348	7-355	7-362	7-369	7-376	7-382	7-389	7-396	7-403	7-409	1	1	2	3	3	4	5	5	6

	0	1	2	3	4	5	6	7	8	9	Meán difríochtaí Mean Differences								
											1 2 3			4 5 6			7 8 9		
											1	2	3	4	5	6	7	8	9
55	7-416	7-423	7-430	7-436	7-443	7-450	7-457	7-463	7-470	7-477	1	1	2	3	3	4	5	5	6
56	7-483	7-490	7-497	7-503	7-510	7-517	7-523	7-530	7-537	7-543	1	1	2	3	3	4	5	5	6
57	7-550	7-556	7-563	7-570	7-576	7-583	7-589	7-596	7-603	7-609	1	1	2	3	3	4	5	5	6
58	7-616	7-622	7-629	7-635	7-642	7-649	7-655	7-662	7-668	7-675	1	1	2	3	3	4	5	5	6
59	7-681	7-688	7-694	7-701	7-701	7-714	7-720	7-727	7-733	7-740	1	1	2	3	3	4	4	5	6
60	7-746	7-752	7-759	7-765	7-772	7-778	7-785	7-791	7-797	7-804	1	1	2	3	3	4	4	5	6
61	7-810	7-817	7-823	7-829	7-836	7-842	7-849	7-855	7-861	7-868	1	1	2	3	3	4	4	5	6
62	7-874	7-880	7-887	7-893	7-899	7-906	7-912	7-918	7-925	7-931	1	1	2	3	3	4	4	5	6
63	7-937	7-944	7-950	7-956	7-962	7-969	7-975	7-981	7-987	7-994	1	1	2	3	3	4	4	5	6
64	8-000	8-006	8-012	8-019	8-025	8-031	8-037	8-044	8-050	8-056	1	1	2	2	3	4	4	5	6
65	8-062	8-068	8-075	8-081	8-087	8-093	8-099	8-106	8-112	8-118	1	1	2	2	3	4	4	5	6
66	8-124	8-130	8-136	8-142	8-149	8-155	8-161	8-167	8-173	8-179	1	1	2	2	3	4	4	5	5
67	8-185	8-191	8-198	8-204	8-210	8-216	8-222	8-228	8-234	8-240	1	1	2	2	3	4	4	5	5
68	8-246	8-252	8-258	8-264	8-270	8-276	8-283	8-289	8-295	8-301	1	1	2	2	3	4	4	5	5
69	8-307	8-313	8-319	8-325	8-331	8-337	8-343	8-349	8-355	8-361	1	1	2	2	3	4	4	5	5
70	8-367	8-373	8-379	8-385	8-390	8-396	8-402	8-408	8-414	8-420	1	1	2	2	3	4	4	5	5
71	8-426	8-432	8-438	8-444	8-450	8-456	8-462	8-468	8-473	8-479	1	1	2	2	3	4	4	5	5
72	8-485	8-491	8-497	8-503	8-509	8-515	8-521	8-526	8-532	8-538	1	1	2	2	3	4	4	5	5
73	8-544	8-550	8-556	8-562	8-567	8-573	8-579	8-585	8-591	8-597	1	1	2	2	3	3	4	5	5
74	8-602	8-608	8-614	8-620	8-626	8-631	8-637	8-643	8-649	8-654	1	1	2	2	3	3	4	5	5
75	8-660	8-666	8-672	8-678	8-683	8-689	8-695	8-701	8-706	8-712	1	1	2	2	3	3	4	5	5
76	8-718	8-724	8-729	8-735	8-741	8-746	8-752	8-758	8-764	8-769	1	1	2	2	3	3	4	5	5
77	8-775	8-781	8-786	8-792	8-798	8-803	8-809	8-815	8-821	8-826	1	1	2	2	3	3	4	4	5
78	8-832	8-837	8-843	8-849	8-854	8-860	8-871	8-866	8-877	8-883	1	1	2	2	3	3	4	4	5
79	8-888	8-894	8-899	8-905	8-911	8-916	8-922	8-927	8-933	8-939									

Dealraigh
Subtract

	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
10	10000	9901	9804	9709	9615	9524	9434	9346	9259	9174	9	18	27	36	45	55	64	73	82
11	9091	9009	8929	8850	8772	8696	8621	8547	8475	8403	8	15	23	30	38	45	53	61	68
12	8333	8264	8197	8130	8065	8000	7937	7874	7813	7752	6	13	19	26	32	38	45	51	58
13	7692	7634	7576	7519	7463	7407	7353	7299	7246	7194	5	11	16	22	27	33	38	44	49
14	7143	7092	7042	6993	6944	6897	6849	6803	6757	6711	5	10	14	19	24	29	33	38	43
15	6667	6623	6579	6536	6494	6452	6410	6369	6329	6289	4	8	13	17	21	25	29	33	38
16	6250	6211	6173	6135	6098	6061	6024	5988	5952	5917	4	7	11	15	18	22	26	29	33
17	5882	5848	5814	5780	5747	5714	5682	5650	5618	5587	3	7	10	13	16	20	23	26	29
18	5556	5525	5495	5464	5435	5405	5376	5348	5319	5291	3	6	9	12	15	18	21	23	26
19	5263	5236	5208	5181	5155	5128	5102	5076	5051	5025	3	5	8	11	13	16	18	21	24
20	5000	4975	4950	4926	4902	4878	4854	4831	4808	4785	2	5	7	10	12	14	17	19	21
21	4762	4739	4717	4695	4673	4651	4630	4608	4587	4566	2	4	7	9	11	13	15	17	20
22	4545	4525	4505	4484	4464	4444	4425	4405	4386	4367	2	4	6	8	10	12	14	16	18
23	4348	4329	4310	4292	4274	4255	4237	4219	4202	4184	2	4	5	7	9	11	13	14	16
24	4167	4149	4132	4115	4098	4082	4065	4049	4032	4016	2	3	5	7	8	10	12	13	15
25	4000	3984	3968	3953	3937	3922	3906	3891	3876	3861	2	3	5	6	8	9	11	12	14
26	3846	3831	3817	3802	3788	3774	3759	3745	3731	3717	1	3	4	6	7	9	10	11	13
27	3704	3690	3676	3663	3650	3636	3623	3610	3597	3584	1	3	4	5	7	8	9	11	12
28	3571	3559	3546	3534	3521	3509	3497	3484	3472	3460	1	2	4	5	6	7	9	10	11
29	3448	3436	3425	3413	3401	3390	3378	3367	3356	3344	1	2	3	5	6	7	8	9	10
30	3333	3322	3311	3300	3289	3279	3268	3257	3247	3236	1	2	3	4	5	6	7	9	10
31	3226	3215	3205	3195	3185	3175	3165	3155	3145	3135	1	2	3	4	5	6	7	8	9
32	3125	3115	3106	3096	3086	3077	3067	3058	3049	3040	1	2	3	4	5	6	7	8	9
33	3030	3021	3012	3003	2994	2985	2976	2967	2959	2950	1	2	3	4	4	5	6	7	8
34	2941	2933	2924	2915	2907	2899	2890	2882	2874	2865	1	2	3	3	4	5	6	7	8
35	2857	2849	2841	2833	2825	2817	2809	2801	2793	2786	1	2	2	3	4	5	6	6	7
36	2778	2770	2762	2755	2747	2740	2732	2725	2717	2710	1	2	2	3	4	5	5	6	7
37	2703	2695	2688	2681	2674	2667	2660	2653	2646	2639	1	1	2	3	4	4	5	6	6
38	2632	2625	2618	2611	2604	2597	2591	2584	2577	2571	1	1	2	3	3	4	5	5	6
39	2564	2558	2551	2545	2538	2532	2525	2519	2513	2506	1	1	2	3	3	4	4	5	6
40	2500	2494	2488	2481	2475	2469	2463	2457	2451	2445	1	1	2	2	3	4	4	5	5
41	2439	2433	2427	2421	2415	2410	2404	2398	2392	2387	1	1	2	2	3	3	4	5	5
42	2381	2375	2370	2364	2358	2353	2347	2342	2336	2331	1	1	2	2	3	3	4	4	5
43	2326	2320	2315	2309	2304	2299	2294	2288	2283	2278	1	1	2	2	3	3	4	4	5
44	2273	2268	2262	2257	2252	2247	2242	2237	2232	2227	1	1	2	2	3	3	4	4	5
45	2222	2217	2212	2208	2203	2198	2193	2188	2183	2179	0	1	1	2	2	3	3	4	4
46	2174	2169	2165	2160	2155	2151	2146	2141	2137	2132	0	1	1	2	2	3	3	4	4
47	2128	2123	2119	2114	2110	2105	2101	2096	2092	2088	0	1	1	2	2	3	3	4	4
48	2083	2079	2075	2070	2066	2062	2058	2053	2049	2045	0	1	1	2	2	3	3	3	4
49	2041	2037	2033	2028	2024	2020	2016	2012	2008	2004	0	1	1	2	2	2	3	3	4
50	2000	1996	1992	1988	1984	1980	1976	1972	1969	1965	0	1	1	2	2	2	3	3	4
51	1961	1957	1953	1949	1946	1942	1938	1934	1931	1927	0	1	1	2	2	2	3	3	3
52	1923	1919	1916	1912	1908	1905	1901	1898	1894	1890	0	1	1	1	2	2	3	3	3
53	1887	1883	1880	1876	1873	1869	1866	1862	1859	1855	0	1	1	1	2	2	2	3	3
54	1852	1848	1845	1842	1838	1835	1832	1828	1825	1821	0	1	1	1	2	2	2	3	3

Ba chóir suíomh an phointe deachúlaigh d'aimsíú trí mion-scrúdú a dhéanamh.
The position of the decimal point should be found by inspection.

Dealraigh
Subtract

	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
55	1818	1815	1812	1808	1805	1802	1799	1795	1792	1789	0	1	1	1	2	2	2	3	3
56	1768	1783	1779	1776	1773	1770	1767	1764	1761	1757	0	1	1	1	2	2	2	3	3
57	1754	1751	1748	1745	1742	1739	1736	1733	1730	1727	0	1	1	1	2	2	2	3	3
58	1724	1721	1718	1715	1712	1709	1706	1704	1701	1698	0	1	1	1	1	2	2	2	3
59	1695	1692	1689	1686	1684	1681	1678	1675	1672	1669	0	1	1	1	1	2	2	2	3
60	1667	1664	1661	1658	1656	1653	1650	1647	1645	1642	0	1	1	1	1	2	2	2	3
61	1639	1637	1634	1631	1629	1626	1623	1621	1618	1616	0	1	1	1	1	2	2	2	2
62	1613	1610	1608	1605	1603	1600	1597	1595	1592	1590	0	1	1	1	1	2	2	2	2
63	1587	1585	1582	1580	1577	1575	1572	1570	1567	1565	0	0	1	1	1	1	2	2	2
64	1563	1560	1558	1555	1553	1550	1548	1546	1543	1541	0	0	1	1	1	1	2	2	2
65	1538	1536	1534	1531	1529	1527	1524	1522	1520	1517	0	0	1	1	1	1	2	2	2
66	1515	1513	1511	1508	1506	1504	1502	1499	1497	1495	0	0	1	1	1	1	2	2	2
67	1493	1490	1488	1486	1484	1481	1479	1477	1475	1473	0	0	1	1	1	1	2	2	2
68	1471	1468	1466	1464	1462	1460	1458	1456	1453	1451	0	0	1	1	1	1	2	2	2
69	1449	1447	1445	1443	1441	1439	1437	1435	1433	1431	0	0	1	1	1	1	1	2	2
70	1429	1427	1425	1422	1420	1418	1416	1414	1412	1410	0	0	1	1	1	1	1	2	2
71	1408	1406	1404	1403	1401	1399	1397	1395	1393	1391	0	0	1	1	1	1	1	2	2
72	1389	1387	1385	1383	1381	1379	1377	1376	1374	1372	0	0	1	1	1	1	1	2	2
73	1370	1368	1366	1364	1362	1361	1359	1357	1355	1353	0	0	1	1	1	1	1	2	2
74	1351	1350	1348	1346	1344	1342	1340	1339	1337	1335	0	0	1	1	1	1	1	1	2
75	1333	1332	1330	1328	1326	1325	1323	1321	1319	1318	0	0	1	1	1	1	1	1	2
76	1316	1314	1312	1311	1309	1307	1305	1304	1302	1300	0	0	1	1	1	1	1	1	2
77	1299	1297	1295	1294	1292	1290	1289	1287	1285	1284	0	0	0	1	1	1	1	1	1
78	1282	1280	1279	1277	1276	1274	1272	1271	1269	1267	0	0	0	1	1	1	1	1	1
79	1266	1264	1263	1261	1259	1258	1256	1255	1253	1252	0	0	0	1	1	1	1	1	1
80	1250	1248	1247	1245	1244	1242	1241	1239	1238	1236	0	0	0	1	1	1	1	1	1
81	1235	1233	1232	1230	1229	1227	1225	1224	1222	1221	0	0	0	1	1	1	1	1	1
82	1220	1218	1217	1215	1214	1212	1211	1209	1208	1206	0	0	0	1	1	1	1	1	1
83	1205	1203	1202	1200	1199	1198	1196	1195	1193	1192	0	0	0	1	1	1	1	1	1
84</																			

x	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	1.0000	1.0101	1.0202	1.0305	1.0408	1.0513	1.0618	1.0725	1.0833	1.0942
0.1	1.1052	1.1163	1.1275	1.1388	1.1503	1.1618	1.1735	1.1853	1.1972	1.2092
0.2	1.2214	1.2337	1.2461	1.2586	1.2712	1.2840	1.2969	1.3100	1.3231	1.3364
0.3	1.3499	1.3634	1.3771	1.3910	1.4049	1.4191	1.4333	1.4477	1.4623	1.4770
0.4	1.4918	1.5068	1.5220	1.5373	1.5527	1.5683	1.5841	1.6000	1.6161	1.6323
0.5	1.6487	1.6653	1.6820	1.6989	1.7160	1.7333	1.7507	1.7683	1.7860	1.8040
0.6	1.8221	1.8404	1.8589	1.8776	1.8965	1.9155	1.9348	1.9542	1.9739	1.9937
0.7	2.0138	2.0340	2.0544	2.0751	2.0959	2.1170	2.1383	2.1598	2.1815	2.2034
0.8	2.2255	2.2479	2.2705	2.2933	2.3164	2.3396	2.3632	2.3869	2.4109	2.4351
0.9	2.4596	2.4843	2.5093	2.5345	2.5600	2.5857	2.6117	2.6379	2.6645	2.6912
1.0	2.7183	2.7456	2.7732	2.8011	2.8292	2.8576	2.8864	2.9154	2.9447	2.9743
1.1	3.0042	3.0344	3.0649	3.0957	3.1268	3.1582	3.1899	3.2220	3.2544	3.2871
1.2	3.3201	3.3535	3.3874	3.4212	3.4556	3.4903	3.5254	3.5608	3.5966	3.6328
1.3	3.6693	3.7062	3.7434	3.7810	3.8190	3.8574	3.8962	3.9354	3.9749	4.0149
1.4	4.0552	4.0960	4.1371	4.1787	4.2207	4.2631	4.3060	4.3492	4.3929	4.4371
1.5	4.4817	4.5267	4.5722	4.6182	4.6646	4.7115	4.7588	4.8066	4.8550	4.9037
1.6	4.9530	5.0028	5.0531	5.1039	5.1552	5.2070	5.2593	5.3122	5.3656	5.4195
1.7	5.4739	5.5290	5.5845	5.6407	5.6973	5.7546	5.8124	5.8709	5.9299	5.9895
1.8	6.0496	6.1104	6.1719	6.2339	6.2965	6.3598	6.4237	6.4883	6.5535	6.6194
1.9	6.6859	6.7531	6.8210	6.8895	6.9588	7.0287	7.0993	7.1707	7.2427	7.3155
2.0	7.3891	7.4633	7.5383	7.6141	7.6906	7.7679	7.8460	7.9248	8.0045	8.0849
2.1	8.1662	8.2482	8.3311	8.4149	8.4994	8.5849	8.6711	8.7583	8.8463	8.9352
2.2	9.0250	9.1157	9.2073	9.2999	9.3933	9.4877	9.5831	9.6794	9.7767	9.8749
2.3	9.9742	10.074	10.176	10.278	10.381	10.486	10.591	10.697	10.805	10.913
2.4	11.023	11.134	11.246	11.359	11.473	11.588	11.705	11.822	11.941	12.061
2.5	12.182	12.305	12.429	12.554	12.680	12.807	12.936	13.066	13.197	13.330
2.6	13.464	13.599	13.736	13.874	14.013	14.154	14.296	14.440	14.585	14.732
2.7	14.880	15.029	15.180	15.333	15.487	15.643	15.800	15.959	16.119	16.281
2.8	16.445	16.610	16.777	16.945	17.116	17.288	17.462	17.637	17.814	17.993
2.9	18.174	18.357	18.541	18.728	18.916	19.106	19.298	19.492	19.688	19.886
3.0	20.086	20.287	20.491	20.697	20.905	21.115	21.327	21.542	21.758	21.977
3.1	22.198	22.421	22.646	22.874	23.104	23.336	23.571	23.808	24.047	24.288
3.2	24.533	24.779	25.028	25.280	25.534	25.790	26.050	26.311	26.576	26.843
3.3	27.113	27.385	27.660	27.938	28.219	28.503	28.789	29.079	29.371	29.666
3.4	29.964	30.265	30.569	30.877	31.187	31.500	31.817	32.137	32.460	32.786
3.5	33.115	33.443	33.784	34.124	34.467	34.813	35.163	35.517	35.874	36.234
3.6	36.598	36.966	37.338	37.713	38.092	38.475	38.861	39.252	39.646	40.045
3.7	40.447	40.854	41.264	41.679	42.098	42.521	42.948	43.380	43.816	44.256
3.8	44.701	45.150	45.604	46.053	46.525	46.993	47.465	47.942	48.424	48.911
3.9	49.402	49.899	50.400	50.907	51.419	51.935	52.457	52.985	53.517	54.055
4.0	54.598									
x	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09

x	e^x	x	e^x	x	e^x	x	e^x	x	e^x	x	e^x
4.1	60.340	4.6	99.484	5.1	164.02	5.6	270.43	6.1	445.86	6.6	735.10
4.2	66.686	4.7	109.95	5.2	181.27	5.7	298.87	6.2	492.75	6.7	812.41
4.3	73.700	4.8	121.51	5.3	200.34	5.8	330.30	6.3	544.57	6.8	897.85
4.4	81.451	4.9	134.29	5.4	221.41	5.9	365.04	6.4	601.85	6.9	992.27
4.5	90.017	5.0	148.41	5.5	244.69	6.0	403.43	6.5	665.14	7.0	1096.63

Le haghaidh luachanna eile bain úsáid as $\log_{10} e^x = 0.43429 \times x$, nó as logartaim nádúrtha. Féach bun lch.29.
 For further values use $\log_{10} e^x \approx 0.43429 \times x$; or use Natural logarithms. See foot of p. 29.

x	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	1.0000	.9900	.9802	.9704	.9608	.9512	.9418	.9324	.9231	.9139
0.1	0.9048	.8958	.8869	.8781	.8694	.8607	.8521	.8437	.8353	.8270
0.2	0.8187	.8106	.8025	.7945	.7866	.7788	.7711	.7634	.7558	.7483
0.3	0.7408	.7334	.7261	.7189	.7118	.7047	.6977	.6907	.6839	.6771
0.4	0.6703	.6637	.6570	.6505	.6440	.6376	.6313	.6250	.6188	.6126
0.5	0.6065	.6005	.5945	.5886	.5827	.5769	.5712	.5655	.5599	.5543
0.6	0.5488	.5434	.5379	.5326	.5273	.5220	.5169	.5117	.5066	.5016
0.7	0.4966	.4916	.4868	.4819	.4771	.4724	.4677	.4630	.4584	.4538
0.8	0.4493	.4449	.4404	.4360	.4317	.4274	.4232	.4190	.4148	.4107
0.9	0.4066	.4025	.3985	.3946	.3906	.3867	.3829	.3791	.3753	.3716
1.0	0.3679	.3642	.3606	.3570	.3535	.3499	.3465	.3430	.3396	.3362
1.1	0.3329	.3296	.3263	.3230	.3198	.3166	.3135	.3104	.3073	.3042
1.2	0.3012	.2982	.2952	.2923	.2894	.2865	.2837	.2808	.2780	.2753
1.3	0.2725	.2698	.2671	.2645	.2618	.2592	.2567	.2541	.2516	.2491
1.4	0.2466	.2441	.2417	.2393	.2369	.2346	.2322	.2299	.2276	.2254
1.5	0.2231	.2209	.2187	.2165	.2144	.2122	.2101	.2080	.2060	.2039
1.6	0.2019	.1999	.1979	.1959	.1940	.1920	.1901	.1882	.1864	.1845
1.7	0.1827	.1809	.1791	.1773	.1755	.1738	.1720	.1703	.1686	.1670
1.8	0.1653	.1637	.1620	.1604	.1588	.1572	.1557	.1541	.1526	.1511
1.9	0.1496	.1481	.1466	.1451	.1437	.1423	.1409	.1395	.1381	.1367
2.0	0.1353	.1340	.1327	.1313	.1300	.1287	.1275	.1262	.1249	.1237
2.1	0.1225	.1212	.1200	.1188	.1177	.1165	.1153	.1142	.1130	.1119
2.2	0.1108	.1097	.1086	.1075	.1065	.1054	.1044	.1033	.1023	.1013
2.3	0.1003	.0993	.0983	.0973	.0963	.0954	.0944	.0935	.0925	.0916
2.4	0.0907	.0898	.0889	.0880	.0872	.0863	.0854	.0846	.0837	.0829
2.5	0.0821	.0813	.0805	.0797	.0789	.0781	.0773	.0765	.0758	.0750
2.6	0.0743	.0735	.0728	.0721	.0714	.0707	.0699	.0693	.0686	.0679
2.7	0.0672	.0665	.0659	.0652	.0646	.0639	.0633	.0627	.0620	.0614
2.8	0.0608	.0602	.0596	.0590	.0584	.0578	.0573	.0567	.0561	.0556
2.9	0.0550	.0545	.0539	.0534	.0529	.0523	.0518	.0513	.0508	.0503
3.0	0.0498	.0493	.0488	.0483	.0478	.0474	.0469	.0464	.0460	.0455
3.1	0.0450	.0446	.0442	.0437	.0433	.0429	.0424	.0420	.0416	.0412
3.2	0.0408	.0404	.0400	.0396	.0392	.0388	.0384	.0380	.0376	.0373
3.3	0.0369	.0365	.0362	.0358	.0354	.0351	.0347	.0344	.0340	.0337
3.4	0.0334	.0330	.0327	.0324	.0321	.0317	.0314	.0311	.0308	.0305
3.5	0.0302	.0299	.0296	.0293	.0290	.0287	.0284	.0282	.0279	.0276
3.6	0.0273	.0271	.0268	.0265	.0263	.0260	.0257	.0255	.0252	.0250
3.7	0.0247	.0245	.0242	.0240	.0238	.0235	.0233	.0231	.0228	.0226
3.8	0.0224	.0221	.0219	.0217	.0215	.0213	.0211	.0209	.0207	.0204
3.9	0.0202	.0200	.0198	.0196	.0194	.0193	.0191	.0189	.0187	.0185
4.0	0.0183									
x	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09

Is féidir e^{-x} a fháil ó thábla e^x agus tábla na ndeilíní.

e^{-x} may be found from the e^x table and the reciprocal table.

$y = e^{1.1065}, \log_e y = 4.1065$
 $\log_e 10 = 2.3026$

$y = e^{18.6302}, \log_e y = 18.6302$
 $2 \log_e 10^4 = 18.4206$

$\log_e 6.073 = 1.8039$

$\log_e 1.233 = 0.2096$

$\therefore y = 60.73$

$\therefore y = 10^8 \times 1.233$

cosh x

x	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	1.0000	1.0001	1.0002	1.0005	1.0008	1.0013	1.0018	1.0025	1.0032	1.0041
0.1	1.0050	1.0061	1.0072	1.0085	1.0098	1.0113	1.0128	1.0145	1.0162	1.0181
0.2	1.0201	1.0221	1.0243	1.0266	1.0289	1.0314	1.0340	1.0367	1.0395	1.0423
0.3	1.0453	1.0484	1.0516	1.0549	1.0584	1.0619	1.0655	1.0692	1.0731	1.0770
0.4	1.0811	1.0852	1.0895	1.0939	1.0984	1.1030	1.1077	1.1125	1.1174	1.1225
0.5	1.1276	1.1329	1.1383	1.1438	1.1494	1.1551	1.1609	1.1669	1.1730	1.1792
0.6	1.1855	1.1919	1.1984	1.2051	1.2119	1.2188	1.2258	1.2330	1.2402	1.2476
0.7	1.2552	1.2628	1.2706	1.2785	1.2865	1.2947	1.3030	1.3114	1.3199	1.3286
0.8	1.3374	1.3464	1.3555	1.3647	1.3740	1.3835	1.3932	1.4029	1.4128	1.4229
0.9	1.4331	1.4434	1.4539	1.4645	1.4753	1.4862	1.4973	1.5085	1.5199	1.5314
1.0	1.5431	1.5549	1.5669	1.5790	1.5913	1.6038	1.6164	1.6292	1.6421	1.6552
1.1	1.6685	1.6820	1.6956	1.7093	1.7233	1.7374	1.7517	1.7662	1.7808	1.7957
1.2	1.8107	1.8258	1.8412	1.8568	1.8725	1.8884	1.9045	1.9208	1.9373	1.9540
1.3	1.9709	1.9880	2.0053	2.0228	2.0404	2.0583	2.0764	2.0947	2.1132	2.1320
1.4	2.1509	2.1700	2.1894	2.2090	2.2288	2.2488	2.2691	2.2896	2.3103	2.3312
1.5	2.3524	2.3738	2.3955	2.4174	2.4395	2.4619	2.4845	2.5073	2.5305	2.5538
1.6	2.5775	2.6014	2.6255	2.6499	2.6746	2.6995	2.7247	2.7502	2.7760	2.8020
1.7	2.8283	2.8549	2.8818	2.9090	2.9364	2.9642	2.9922	3.0206	3.0492	3.0782
1.8	3.1075	3.1371	3.1669	3.1971	3.2277	3.2585	3.2897	3.3212	3.3530	3.3852
1.9	3.4177	3.4506	3.4838	3.5173	3.5512	3.5855	3.6201	3.6551	3.6904	3.7261
2.0	3.7622	3.7987	3.8355	3.8727	3.9103	3.9483	3.9867	4.0255	4.0647	4.1043
2.1	4.1443	4.1847	4.2256	4.2669	4.3085	4.3507	4.3932	4.4362	4.4797	4.5236
2.2	4.5679	4.6127	4.6580	4.7037	4.7499	4.7966	4.8437	4.8914	4.9395	4.9881
2.3	5.0372	5.0868	5.1370	5.1876	5.2388	5.2905	5.3427	5.3954	5.4487	5.5026
2.4	5.5569	5.6119	5.6674	5.7235	5.7801	5.8373	5.8951	5.9535	6.0125	6.0721
2.5	6.1323	6.1931	6.2546	6.3166	6.3793	6.4426	6.5066	6.5712	6.6365	6.7024
2.6	6.7690	6.8363	6.9043	6.9729	7.0423	7.1123	7.1831	7.2546	7.3268	7.3998
2.7	7.4735	7.5479	7.6231	7.6991	7.7758	7.8533	7.9316	8.0106	8.0905	8.1712
2.8	8.2527	8.3351	8.4182	8.5022	8.5871	8.6728	8.7594	8.8469	8.9352	9.0244
2.9	9.1146	9.2056	9.2976	9.3905	9.4844	9.5791	9.6749	9.7716	9.8693	9.9680
3.0	10.068	10.168	10.270	10.373	10.477	10.581	10.687	10.794	10.902	11.011
3.1	11.122	11.233	11.345	11.459	11.574	11.689	11.807	11.925	12.044	12.165
3.2	12.287	12.410	12.534	12.660	12.786	12.915	13.044	13.175	13.307	13.440
3.3	13.575	13.711	13.848	13.987	14.127	14.269	14.412	14.556	14.702	14.850
3.4	14.999	15.149	15.301	15.455	15.610	15.766	15.924	16.084	16.245	16.408
3.5	16.573	16.739	16.907	17.077	17.248	17.421	17.596	17.772	17.951	18.131
3.6	18.313	18.497	18.682	18.870	19.059	19.250	19.444	19.639	19.836	20.035
3.7	20.236	20.439	20.644	20.852	21.061	21.272	21.486	21.702	21.919	22.139
3.8	22.362	22.586	22.813	23.042	23.273	23.507	23.743	23.982	24.222	24.466
3.9	24.711	24.959	25.210	25.463	25.719	25.977	26.238	26.502	26.768	27.037
4.0	27.308									
x	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09

Le haghaidh luachanna eile bain úsáid as $\cosh x = \frac{1}{2}(e^x + e^{-x})$

For further values use $\cosh x = \frac{1}{2}(e^x + e^{-x})$

sinh x

x	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	0.0000	0.0100	0.0200	0.0300	0.0400	0.0500	0.0600	0.0701	0.0801	0.0901
0.1	0.1002	0.1102	0.1203	0.1304	0.1405	0.1506	0.1607	0.1708	0.1810	0.1911
0.2	0.2013	0.2115	0.2218	0.2320	0.2423	0.2526	0.2629	0.2733	0.2837	0.2941
0.3	0.3045	0.3150	0.3255	0.3360	0.3466	0.3572	0.3678	0.3785	0.3892	0.4000
0.4	0.4108	0.4216	0.4325	0.4434	0.4543	0.4653	0.4764	0.4875	0.4986	0.5098
0.5	0.5211	0.5324	0.5438	0.5552	0.5666	0.5782	0.5897	0.6014	0.6131	0.6248
0.6	0.6367	0.6485	0.6605	0.6725	0.6846	0.6967	0.7090	0.7213	0.7336	0.7461
0.7	0.7586	0.7712	0.7838	0.7966	0.8094	0.8223	0.8353	0.8484	0.8615	0.8748
0.8	0.8881	0.9015	0.9150	0.9286	0.9423	0.9561	0.9700	0.9840	0.9981	1.0122
0.9	1.0265	1.0409	1.0554	1.0700	1.0847	1.0995	1.1144	1.1294	1.1446	1.1598
1.0	1.1752	1.1907	1.2063	1.2220	1.2379	1.2539	1.2700	1.2862	1.3025	1.3190
1.1	1.3356	1.3524	1.3693	1.3863	1.4035	1.4208	1.4382	1.4558	1.4735	1.4914
1.2	1.5095	1.5276	1.5460	1.5645	1.5831	1.6019	1.6209	1.6400	1.6593	1.6788
1.3	1.6984	1.7182	1.7381	1.7583	1.7786	1.7991	1.8198	1.8406	1.8617	1.8829
1.4	1.9043	1.9259	1.9477	1.9697	1.9919	2.0143	2.0369	2.0597	2.0827	2.1059
1.5	2.1293	2.1529	2.1768	2.2008	2.2251	2.2496	2.2743	2.2993	2.3245	2.3499
1.6	2.3756	2.4015	2.4276	2.4540	2.4806	2.5075	2.5346	2.5620	2.5896	2.6175
1.7	2.6456	2.6740	2.7027	2.7317	2.7609	2.7904	2.8202	2.8503	2.8806	2.9112
1.8	2.9422	2.9734	3.0049	3.0367	3.0689	3.1013	3.1340	3.1671	3.2005	3.2341
1.9	3.2682	3.3025	3.3372	3.3722	3.4075	3.4432	3.4792	3.5156	3.5523	3.5894
2.0	3.6269	3.6647	3.7028	3.7413	3.7803	3.8196	3.8593	3.8993	3.9398	3.9806
2.1	4.0219	4.0635	4.1056	4.1480	4.1909	4.2342	4.2779	4.3221	4.3666	4.4116
2.2	4.4571	4.5030	4.5494	4.5962	4.6434	4.6913	4.7394	4.7881	4.8372	4.8868
2.3	4.9370	4.9876	5.0387	5.0903	5.1425	5.1951	5.2483	5.3020	5.3562	5.4109
2.4	5.4662	5.5221	5.5785	5.6354	5.6929	5.7510	5.8097	5.8689	5.9288	5.9892
2.5	6.0502	6.1118	6.1741	6.2369	6.3004	6.3645	6.4293	6.4946	6.5605	6.6274
2.6	6.6947	6.7628	6.8315	6.9008	6.9709	7.0417	7.1132	7.1854	7.2583	7.3319
2.7	7.4063	7.4814	7.5572	7.6338	7.7112	7.7894	7.8683	7.9480	8.0285	8.1098
2.8	8.1919	8.2749	8.3586	8.4432	8.5287	8.6150	8.7021	8.7902	8.8791	8.9689
2.9	9.0596	9.1512	9.2437	9.3371	9.4315	9.5268	9.6231	9.7203	9.8185	9.9177
3.0	10.018	10.119	10.221	10.324	10.429	10.534	10.640	10.748	10.856	10.966
3.1	11.076	11.188	11.301	11.415	11.530	11.647	11.764	11.883	12.003	12.124
3.2	12.246	12.369	12.494	12.620	12.747	12.876	13.006	13.137	13.269	13.403
3.3	13.538	13.674	13.812	13.951	14.092	14.234	14.377	14.522	14.668	14.816
3.4	14.965	15.116	15.268	15.422	15.577	15.734	15.893	16.053	16.214	16.378
3.5	16.543	16.709	16.877	17.047	17.219	17.392	17.567	17.744	17.923	18.103
3.6	18.285	18.470	18.655	18.843	19.033	19.224	19.418	19.613	19.811	20.010
3.7	20.211	20.415	20.620	20.828	21.037	21.249	21.463	21.679	21.897	22.117
3.8	22.339	22.564	22.791	23.020	23.252	23.486	23.722	23.961	24.202	24.445
3.9	24.691	24.939	25.190	25.444	25.700	25.958	26.219	26.483	26.749	27.018
4.0	27.290									
x	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09

Le haghaidh luachanna eile bain úsáid as $\sinh x = \frac{1}{2}(e^x - e^{-x})$

For further values use $\sinh x = \frac{1}{2}(e^x - e^{-x})$

STATISTIC

1. Sainmhíniú an meán mar

$$\mu = \frac{1}{N} \sum_{i=1}^k f_i x_i \quad \text{áit is where}$$

2. Sainmhíniú an Diall Caighdeánach, σ , mar

$$\sigma^2 = \frac{1}{N} \sum_{i=1}^k f_i (x_i - \bar{x})^2$$

3. Meán Bréige agus Aonaid Ranga. Má ghlactar le a mar mheán bréige agus más $d_i = \frac{x_i - a}{C}$, áit is C an t-eatramh ranga, ansan

$$\mu = a + \frac{C}{N} \sum_{i=1}^k f_i d_i, \text{ agus}$$

$$\sigma^2 = \frac{C^2}{N} \sum_{i=1}^k f_i d_i^2 - (\mu - a)^2$$

4. Samplóireacht

\bar{X} , an meán de shampla, gur méad dó n , is meastachán neamhlaofa é de μ meán an daonra.

$S^2 = \frac{1}{n-1} \sum_{i=1}^n (X_i - \bar{X})^2$ is meastachán neamhlaofa é de σ^2 breachnú an daonra.

Is é $\frac{\sigma}{\sqrt{n}}$ earráid chaighdeánach an mheáin agus is é $\sqrt{\frac{pq}{n}}$ earráid chaighdeánach na comhréire, áit gur ionann p agus an dóchúlacht tarlaithe teaghais agus go bhfuil $q = 1 - p$.

5. An T-tastáil: $t = \frac{\bar{X} - \mu}{S/\sqrt{n}}$

6. An χ^2 -tastáil:

$$\chi^2 = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i}$$

áit is é O_i an mhínicíocht bhreacaithe agus E_i an mhínicíocht dhóigh.

STATISTICS

1. The mean is defined as

$$N = \sum_{i=1}^k f_i$$

2. The Standard Deviation, σ , is defined as

$$\sigma^2 = \frac{1}{N} \sum_{i=1}^k f_i (x_i - \bar{x})^2$$

3. Assumed Mean and Class Units. If an assumed mean a is taken and if

$d_i = \frac{x_i - a}{C}$ where C is the class interval, then

$$\mu = a + \frac{C}{N} \sum_{i=1}^k f_i d_i, \text{ agus}$$

$$\sigma^2 = \frac{C^2}{N} \sum_{i=1}^k f_i d_i^2 - (\mu - a)^2$$

4. Sampling

\bar{X} , the mean of a sample of size n is an unbiased estimate of μ , the mean of the population.

$S^2 = \frac{1}{n-1} \sum_{i=1}^n (X_i - \bar{X})^2$ is an unbiased estimate of σ^2 , the variance of the population.

The standard error of the mean is $\frac{\sigma}{\sqrt{n}}$ and the standard error of the proportion is $\sqrt{\frac{pq}{n}}$, where p is the probability of the occurrence of an event and $q = 1 - p$.

5. The T-test: $t = \frac{\bar{X} - \mu}{S/\sqrt{n}}$

6. The χ^2 -test:

$$\chi^2 = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i}$$

where O_i is the observed, and E_i the expected frequency.

7. Dáilte Dóchúlachta

Glac p = dóchúlacht tarlaithe teaghais, agus q = dóchúlacht a neamhtarlaithe. Ansan $p+q = 1$.

Glac $P(r)$ = dóchúlacht go mbeidh r tarlaithe ann díreach.

(i) Dáileadh Déthéarmach

$$P(r) = \binom{n}{r} q^{n-r} p^r$$

Foirmle aithfhillteach:

$$P(r+1) = \frac{n-r}{r+1} \frac{p}{q} \cdot P(r)$$

Feidhm giniúna dóchúlachta:

$$(q+pt)^n$$

$$\mu = np \text{ agus } \sigma = \sqrt{npq}$$

(ii) Dáileadh Poisson

$$P(r) = e^{-\lambda} \frac{\lambda^r}{r!}$$

áit is é λ a meánuimhir na dteaghais, i.e. $\lambda = np$.

Foirmle aithfhillteach:

$$P(r+1) = \frac{\lambda}{r+1} P(r)$$

Feidhm giniúna dóchúlachta:

$$e^{\lambda(t-1)} = e^{-\lambda} \cdot e^{\lambda t}$$

$$\mu = \lambda \text{ agus } \sigma = \sqrt{\lambda}$$

(iii) Dáileadh Normalach (Gaussach)

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

Nuair scríobhtar an athróg in aonaid chaighdeánacha i.e. $Z = \frac{X - \mu}{\sigma}$, bíonn

an cruth $f(z) = \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}z^2}$ ar an

gcothromóid. Ciallaíonn

$$P(a < Z < b) = \int_a^b \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}z^2} dz$$

an dóchúlacht go bhfuil luach idir a agus b ar Z .

Nóta: $\binom{n}{r} = \frac{n(n-1) \dots (n-r+1)}{1 \cdot 2 \dots r}$

i gcás $n \in \mathbb{R}$ agus $r \in \mathbb{N}$

7. Probability Distributions

Let p = the probability of occurrence of an event, and q = the probability of non-occurrence. Then $p+q = 1$.

Let $P(r)$ = the probability of exactly r occurrences.

(i) Binomial Distribution

$$P(r) = \binom{n}{r} q^{n-r} p^r$$

Recursion formula:

$$P(r+1) = \frac{n-r}{r+1} \frac{p}{q} \cdot P(r)$$

Probability Generating Function:

$$(q+pt)^n$$

$$\mu = np \text{ and } \sigma = \sqrt{npq}$$

(ii) Poisson Distribution

$$P(r) = e^{-\lambda} \frac{\lambda^r}{r!}$$

where λ is the average number of occurrences, i.e. $\lambda = np$.

Recursion formula:

$$P(r+1) = \frac{\lambda}{r+1} P(r)$$

Probability Generating Function:

$$e^{\lambda(t-1)} = e^{-\lambda} \cdot e^{\lambda t}$$

$$\mu = \lambda \text{ and } \sigma = \sqrt{\lambda}$$

(iii) Normal (Gaussian) Distribution

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

When the random variable is expressed in standard units, i.e. $Z = \frac{X - \mu}{\sigma}$ the

equation has the form

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

The probability that Z assumes some value between a and b is given by

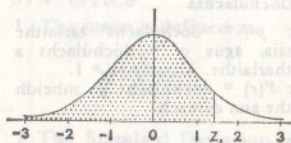
$$P(a < Z < b) = \int_a^b \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}z^2} dz$$

Note: $\binom{n}{r} = \frac{n(n-1) \dots (n-r+1)}{1 \cdot 2 \dots r}$

for $n \in \mathbb{R}$ and $r \in \mathbb{N}$

Achar faoin gCuar Normalach
Area under the Normal Curve

$$P(z \leq z_1) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{z_1} e^{-\frac{1}{2}z^2} dz$$

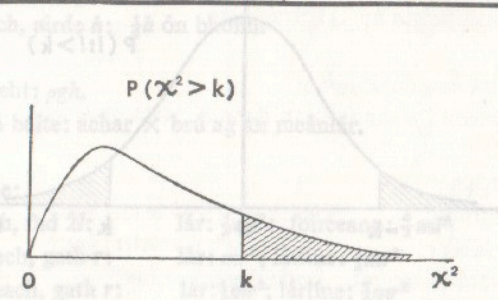


z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	5040	5080	5120	5160	5199	5239	5279	5319	5359
0.1	0.5398	5438	5478	5517	5557	5596	5636	5675	5714	5753
0.2	0.5793	5832	5871	5910	5948	5987	6026	6064	6103	6141
0.3	0.6179	6217	6255	6293	6331	6368	6406	6443	6480	6517
0.4	0.6554	6591	6628	6664	6700	6736	6772	6808	6844	6879
0.5	0.6915	6950	6985	7019	7054	7088	7123	7157	7190	7224
0.6	0.7257	7291	7324	7357	7389	7422	7454	7486	7517	7549
0.7	0.7580	7611	7642	7673	7704	7734	7764	7794	7823	7852
0.8	0.7881	7910	7939	7967	7995	8023	8051	8078	8106	8133
0.9	0.8159	8186	8212	8238	8264	8289	8315	8340	8365	8389
1.0	0.8413	8438	8461	8485	8508	8531	8554	8577	8599	8621
1.1	0.8643	8665	8686	8708	8729	8749	8770	8790	8810	8830
1.2	0.8849	8869	8888	8907	8925	8944	8962	8980	8997	9015
1.3	0.9032	9049	9066	9082	9099	9115	9131	9147	9162	9177
1.4	0.9192	9207	9222	9236	9251	9265	9279	9292	9306	9319
1.5	0.9332	9345	9357	9370	9382	9394	9406	9418	9429	9441
1.6	0.9452	9463	9474	9484	9495	9505	9515	9525	9535	9545
1.7	0.9554	9564	9573	9582	9591	9599	9608	9616	9625	9633
1.8	0.9641	9649	9656	9664	9671	9678	9686	9693	9699	9706
1.9	0.9713	9719	9726	9732	9738	9744	9750	9756	9761	9767
2.0	0.9772	9778	9783	9788	9793	9798	9803	9808	9812	9817
2.1	0.9821	9826	9830	9834	9838	9842	9846	9850	9854	9857
2.2	0.9861	9864	9868	9871	9875	9878	9881	9884	9887	9890
2.3	0.9893	9896	9898	9901	9904	9906	9909	9911	9913	9916
2.4	0.9918	9920	9922	9925	9927	9929	9931	9932	9934	9936
2.5	0.99379	99396	99413	99430	99446	99461	99477	99492	99506	99520
2.6	0.99534	99547	99560	99573	99585	99598	99609	99621	99632	99643
2.7	0.99653	99664	99674	99683	99693	99702	99711	99720	99728	99736
2.8	0.99744	99752	99760	99767	99774	99781	99788	99795	99801	99807
2.9	0.99813	99819	99825	99831	99836	99841	99846	99851	99856	99861
3.0	0.99865	99869	99874	99878	99882	99886	99889	99893	99897	99900
3.1	0.99903	99906	99910	99913	99916	99918	99921	99924	99926	99929
3.2	0.99931	99934	99936	99938	99940	99942	99944	99946	99948	99950
3.3	0.99952	99953	99955	99957	99958	99960	99961	99962	99964	99965
3.4	0.99966	99968	99969	99970	99971	99972	99973	99974	99975	99976
3.5	0.99977	99978	99978	99979	99980	99981	99981	99982	99983	99983
3.6	0.99984	99985	99985	99986	99986	99987	99987	99988	99988	99989
3.7	0.99989	99990	99990	99990	99991	99991	99992	99992	99992	99992
3.8	0.99993	99993	99993	99994	99994	99994	99994	99995	99995	99995
3.9	0.99995	99995	99996	99996	99996	99996	99996	99997	99997	99997

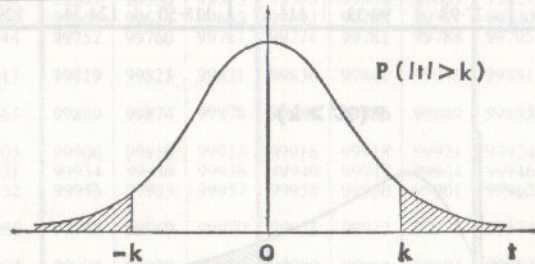
χ²-DÁILEADH

χ²-DISTRIBUTION

	.99	.95	.50	.20	.10	.05	.025	.01
1	.0002	.0039	.45	1.64	2.71	3.84	5.02	6.63
2	.020	.103	1.39	3.22	4.61	5.99	7.38	9.21
3	.115	.352	2.37	4.64	6.25	7.81	9.35	11.34
4	.30	.71	3.36	5.99	7.78	9.49	11.14	13.28
5	.55	1.15	4.35	7.29	9.24	11.07	12.83	15.09
6	.87	1.64	5.35	8.56	10.64	12.59	14.45	16.81
7	1.24	2.17	6.35	9.80	12.02	14.07	16.01	18.48
8	1.65	2.73	7.34	11.03	13.36	15.51	17.53	20.09
9	2.09	3.33	8.34	12.24	14.68	16.92	19.02	21.67
10	2.56	3.94	9.34	13.44	15.99	18.31	20.48	23.21
11	3.05	4.57	10.34	14.63	17.28	19.68	21.92	24.72
12	3.57	5.23	11.34	15.81	18.55	21.03	23.34	26.22
13	4.11	5.89	12.34	16.98	19.81	22.36	24.74	27.69
14	4.66	6.57	13.34	18.15	21.06	23.68	26.12	29.14
15	5.23	7.26	14.34	19.31	22.31	25.00	27.49	30.58
16	5.81	7.96	15.34	20.47	23.54	26.30	28.85	32.00
17	6.41	8.67	16.34	21.61	24.77	27.59	30.19	33.41
18	7.02	9.39	17.34	22.76	25.99	28.87	31.53	34.81
19	7.63	10.12	18.34	23.90	27.20	30.14	32.85	36.19
20	8.26	10.85	19.34	25.04	28.41	31.41	34.17	37.57
21	8.90	11.59	20.34	26.17	29.62	32.67	35.48	38.93
22	9.54	12.34	21.34	27.30	30.81	33.92	36.78	40.29
23	10.20	13.09	22.34	28.43	32.01	35.17	38.08	41.64
24	10.86	13.85	23.34	29.55	33.20	36.42	39.36	42.98
25	11.52	14.61	24.34	30.68	34.38	37.65	40.65	44.31
26	12.20	15.38	25.34	31.79	35.56	38.89	41.92	45.64
27	12.88	16.15	26.34	32.91	36.74	40.11	43.19	46.96
28	13.57	16.93	27.34	34.03	37.92	41.34	44.46	48.28
29	14.26	17.71	28.34	35.14	39.09	42.56	45.72	49.59
30	14.95	18.49	29.34	36.25	40.26	43.77	46.98	50.89
40	22.16	26.51	39.34	47.27	51.81	55.76	59.34	63.69
50	29.71	34.76	49.33	58.16	63.17	67.50	71.42	76.15
60	37.48	43.19	59.33	68.97	74.40	79.08	83.30	88.38
70	45.44	51.74	69.33	79.71	85.53	90.53	95.02	100.43
80	53.54	60.39	79.33	90.41	96.58	101.88	106.63	112.33
90	61.75	69.13	89.33	101.05	107.57	113.15	118.14	124.12
100	70.06	77.93	99.33	111.67	118.50	124.34	129.56	135.81



t-DÁILEADH		t-DISTRIBUTION					
	20	10	5	2	1	0.2	
1	3.078	6.314	12.706	31.821	63.657	318.310	
2	1.886	2.920	4.303	6.965	9.925	22.327	
3	1.638	2.353	3.182	4.541	5.841	10.215	
4	1.533	2.132	2.776	3.747	4.604	7.173	
5	1.476	2.015	2.571	3.365	4.032	5.893	
6	1.440	1.943	2.447	3.143	3.707	5.208	
7	1.415	1.895	2.365	2.998	3.499	4.785	
8	1.397	1.860	2.306	2.896	3.355	4.501	
9	1.383	1.833	2.262	2.821	3.250	4.297	
10	1.372	1.812	2.228	2.764	3.169	4.144	
11	1.363	1.796	2.201	2.718	3.106	4.025	
12	1.356	1.782	2.179	2.681	3.055	3.930	
13	1.350	1.771	2.160	2.650	3.012	3.852	
14	1.345	1.761	2.145	2.624	2.977	3.787	
15	1.341	1.753	2.131	2.602	2.947	3.733	
16	1.337	1.746	2.120	2.583	2.921	3.686	
17	1.333	1.740	2.110	2.567	2.898	3.646	
18	1.330	1.734	2.101	2.552	2.878	3.610	
19	1.328	1.729	2.093	2.539	2.861	3.579	
20	1.325	1.725	2.086	2.528	2.845	3.552	
21	1.323	1.721	2.080	2.518	2.831	3.527	
22	1.321	1.717	2.074	2.508	2.819	3.505	
23	1.319	1.714	2.069	2.500	2.807	3.485	
24	1.318	1.711	2.064	2.492	2.797	3.467	
25	1.316	1.708	2.060	2.485	2.787	3.450	
26	1.315	1.706	2.056	2.479	2.779	3.435	
27	1.314	1.703	2.052	2.473	2.771	3.421	
28	1.313	1.701	2.048	2.467	2.763	3.408	
29	1.311	1.699	2.045	2.462	2.756	3.396	
30	1.310	1.697	2.042	2.457	2.750	3.385	
40	1.303	1.684	2.021	2.423	2.704	3.307	
60	1.296	1.671	2.000	2.390	2.660	3.232	
120	1.289	1.658	1.980	2.358	2.617	3.160	
∞	1.282	1.645	1.960	2.326	2.576	3.090	



MATAMAITIC FHEIDHMEACH

- Aonad faid: méadar (m)
- Aonad mais: cileagram (kg)
- Aonad fórsa: Niútan (N) = kgm/s²
- Aonad oibre: giúl (J) = Nm
- Aonad cumhachta: vata (W) = J/s

Gluaiseacht i líne faoi luasghéarú tairiseach: $v = u + ft$; $s = ut + \frac{1}{2}ft^2$; $v^2 = u^2 + 2fs$

Fuinneamh Poitéinsiúil: mgh . Fuinneamh cinéatach (obair déanta): $\frac{1}{2}mv^2$.

I gcóras imchoimeádach: Fuinneamh poitéinsiúil + fuinneamh cinéatach = méad tairiseach.

Móiminteam chaithnín: \vec{mu}

Spreagadh fórsa = athrú san móiminteam.

Comhéifeacht chúitimh (comhéifeacht leaisteachais):

$$e = -\left(\frac{\text{luas gaolmhar indhiadh iombhualadh}}{\text{luas gaolmhar roimh iombhualadh}}\right)$$

Luasghéarú lárimsitheach: $\frac{v^2}{r} = \omega^2 r$

Dlí Hooke le haghaidh téada leaistigh: $p = kx$ (p an fórsa, x an síneadh, tairiseach don téad é k).

Meánlár:

Stua, gath r ; uillinn 2θ ag an lár: $\frac{r \sin \theta}{\theta}$ ón lárphointe.

Teascóg diosca; gath r , uillinn 2θ : $\frac{2}{3}r \frac{\sin \theta}{\theta}$ ón lárphointe.

Lann triantánach: $\frac{1}{3}$ ón mbonn feadh an mheánlíne.

Meáchanlár:

Leathsféar, gath r : $\frac{3}{8}r$ ón lárphointe.

Sceall leathsféarach, gath r : $\frac{1}{2}r$ ón lárphointe.

Drón-chón ciorclach, airde h : $\frac{1}{4}h$ ón bhonn.

Brú ag pointe i leacht: ρgh .

Sá ar dhromcla atá báite: achar \times brú ag an meánlár.

Móimintí na taimhe:

Bata aonfhoirmeach, fad $2l$: lár: $\frac{1}{3}ml^2$; foirceann: $\frac{4}{3}ml^2$

Fonsa aonfhoirmeach, gath r : lár: mr^2 ; lár líne: $\frac{1}{2}mr^2$

Diosca aonfhoirmeach, gath r : lár: $\frac{1}{2}mr^2$; lár líne: $\frac{1}{4}mr^2$

Dlíth-sféar aonfhoirmeach, gath r : lár líne: $\frac{2}{5}mr^2$

- Unit of length: metre (m)
- Unit of mass: kilogramme (kg)
- Unit of force: Newton (N) = kgm/s²
- Unit of work: Joule (J) = Nm
- Unit of power: Watt (W) = J/s

Linear motion with constant acceleration: $v = u + ft$; $s = ut + \frac{1}{2}ft^2$; $v^2 = u^2 + 2fs$

Potential Energy: mgh Kinetic Energy (work done): $\frac{1}{2}mv^2$.

For a conservative system: Potential Energy + Kinetic Energy = constant.

Momentum of a particle: mu

Impulse of a force = change in momentum.

Coefficient of Restitution (Coefficient of Elasticity):

$$e = -\frac{\text{Relative Velocity after Collision}}{\text{Relative Velocity before Collision}}$$

Centripetal acceleration: $\frac{v^2}{r} = \omega^2 r$

Hooke's Law for elastic string: $p = kx$ (p is force, x is extension, k is constant for the string).

Centroid:

Arc, radius r , angle 2θ at centre: $\frac{r \sin \theta}{\theta}$ from centre.

Sector of disc, radius r , angle 2θ : $\frac{2}{3}r \frac{\sin \theta}{\theta}$ from centre.

Triangular lamina: $\frac{1}{3}$ from base along median.

Centre of Gravity:

Hemisphere, radius r : $\frac{3}{8}r$ from centre.

Hemispherical shell, radius r : $\frac{1}{2}r$ from centre.

Right circular cone, height h : $\frac{1}{4}h$ from base.

Pressure at a point in a fluid: ρgh .

Thrust on an immersed plane surface: Area \times pressure at centroid.

Moments of Inertia:

Uniform rod, length $2l$: centre: $\frac{1}{3}ml^2$; One end: $\frac{1}{3}ml^2$

Uniform hoop, radius r : centre: mr^2 ; diameter: $\frac{1}{2}mr^2$

Uniform disc, radius r : centre: $\frac{1}{2}mr^2$; diameter: $\frac{1}{4}mr^2$

Uniform solid sphere, radius r : diameter: $\frac{2}{5}mr^2$.

$f(x)$	$f'(x) \equiv \frac{d}{dx}[f(x)]$
x^n	nx^{n-1}
$\ln x$	$\frac{1}{x}$
$\cos x$	$-\sin x$
$\sin x$	$\cos x$
$\tan x$	$\sec^2 x$
$\sec x$	$\sec x \tan x$
$\operatorname{cosec} x$	$-\operatorname{cosec} x \cot x$
$\cot x$	$-\operatorname{cosec}^2 x$
e^x	e^x
e^{ax}	ae^{ax}
a^x	$a^x \ln a$
$\cos^{-1} \frac{x}{a}$	$-\frac{1}{\sqrt{a^2-x^2}}$
$\sin^{-1} \frac{x}{a}$	$\frac{1}{\sqrt{a^2-x^2}}$
$\tan^{-1} \frac{x}{a}$	$\frac{a}{a^2+x^2}$
$\sec^{-1} \frac{x}{a}$	$\frac{a}{x\sqrt{x^2-a^2}}$
$\operatorname{cosec}^{-1} \frac{x}{a}$	$-\frac{a}{x\sqrt{x^2-a^2}}$
$\cot^{-1} \frac{x}{a}$	$-\frac{a}{a^2+x^2}$
$\sinh x$	$\cosh x$
$\cosh x$	$\sinh x$
$\tanh x$	$\operatorname{sech}^2 x$
$\coth x$	$-\operatorname{cosech}^2 x$
$\operatorname{sech} x$	$-\operatorname{sech} x \tanh x$
$\operatorname{cosech} x$	$-\operatorname{cosech} x \coth x$
$\sinh^{-1} x$	$\frac{1}{\sqrt{x^2+1}}$
$\cosh^{-1} x$	$\frac{1}{\sqrt{x^2-1}}$
$\tanh^{-1} x$	$\frac{1}{1-x^2}$

Glactar $a > 0$ agus fágtar tairisigh na suimeála ar lár.

We take $a > 0$ and omit constants of integration.

$f(x)$	$\int f(x) dx$
$x^n (n \neq -1)$	$\frac{x^{n+1}}{n+1}$
$\frac{1}{x}$	$\ln x $
$\cos x$	$\sin x$
$\sin x$	$-\cos x$
$\tan x$	$\ln \sec x $
$\sec x$	$\ln \sec x + \tan x $
$\operatorname{cosec} x$	$\ln \left \tan \frac{x}{2} \right $
$\cot x$	$\ln \sin x $
e^x	e^x
e^{ax}	$\frac{1}{a} e^{ax}$
a^x	$\frac{a^x}{\ln a}$
$\frac{1}{\sqrt{a^2+x^2}}$	$\ln \left \frac{x + \sqrt{a^2+x^2}}{a} \right $
$\frac{1}{\sqrt{a^2-x^2}}$	$\sin^{-1} \frac{x}{a}$
$\frac{1}{x^2+a^2}$	$\frac{1}{a} \tan^{-1} \frac{x}{a}$
$\frac{1}{x\sqrt{x^2-a^2}}$	$\frac{1}{a} \sec^{-1} \frac{x}{a}$
$\frac{1}{\sqrt{x^2-a^2}}$	$\ln \left \frac{x + \sqrt{x^2-a^2}}{a} \right $
$\frac{1}{a^2-x^2}$	$\frac{1}{2a} \ln \left \frac{a+x}{a-x} \right $

$$\coth^{-1} x = \frac{1}{x^2 - 1}$$

$$\operatorname{sech}^{-1} x = \frac{1}{x\sqrt{1-x^2}}$$

$$\operatorname{cosech}^{-1} x = \frac{1}{x\sqrt{x^2+1}}$$

Torthaí agus Lionta:
Products and Quotients:

$$y = uv; \frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$$

$$y = \frac{u}{v}; \frac{dy}{dx} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$$

Foirmlí áisiúla:
Useful formulae:

$$\sinh^{-1} x = \ln(x + \sqrt{x^2+1})$$

$(-\infty < x < \infty)$

$$\cosh^{-1} x = \ln(x + \sqrt{x^2-1})$$

$(x \geq 1)$

$$\tanh^{-1} x = \frac{1}{2} \ln \frac{1+x}{1-x}$$

$(-1 < x < 1)$

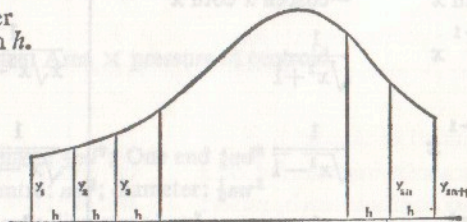
Teoragán Taylor (Taylor's Theorem):

$$f(x+h) = f(x) + hf'(x) + \frac{h^2}{2!} f''(x) + \dots + \frac{h^n}{n!} f^{(n)}(x) + \dots$$

Riail Shimpson (Simpson's Rule):

Corr-uimhir ordanáidí iad $y_1, y_2, \dots, y_{2n-1}$
fad h óna chéile.

$y_1, y_2, \dots, y_{2n+1}$ is an odd number
of ordinates at intervals of length h .



$$\text{Achar (Area)} \approx \frac{1}{3}h\{y_1 + y_{2n+1} + 2(y_3 + y_5 + \dots + y_{2n-1}) + 4(y_2 + y_4 + \dots + y_{2n})\}$$

$$\begin{aligned} \sinh x &= \cosh x \\ \cosh x &= \sinh x \\ \tanh x &= \ln \cosh x \\ \coth x &= \ln |\sinh x| \\ \operatorname{sech} x &= \tan^{-1}(\sinh x) \end{aligned}$$

$$\operatorname{cosech} x = \ln \left| \tanh \frac{x}{2} \right|$$

$$\begin{aligned} \cos^2 x &= \frac{1}{2}[x + \frac{1}{2} \sin 2x] \\ \sin^2 x &= \frac{1}{2}[x - \frac{1}{2} \sin 2x] \\ \cosh^2 x &= \frac{1}{2}[x + \frac{1}{2} \sinh 2x] \end{aligned}$$

$$\sinh^2 x = \frac{1}{2}[-x + \frac{1}{2} \sinh 2x]$$

$$\frac{1}{x\sqrt{a^2-x^2}} = -\frac{1}{a} \operatorname{sech}^{-1} \frac{x}{a}$$

$$\frac{1}{x\sqrt{x^2+a^2}} = -\frac{1}{a} \operatorname{cosech}^{-1} \frac{x}{a}$$

Suimeáil trí mhíreanna:
Integration by parts:

$$\int u dv = uv - \int v du$$

$$\Rightarrow \int u \frac{dv}{dt} dt = \int u dv - \int v \frac{du}{dt} dt$$

TÁBLA ATHRAITHÉ IMPIRIÚIL—MÉADRACH

FAD

1 slat	= 0.9144 m	1 m	= 1.094 slat
1 orlach	= 2.54 cm	1 cm	= 0.3937 orlach
1 míle	= 1.609 km	1 km	= 0.6214 míle

ACHAR

1 slat cr	= 0.8361 m ²	1 m ²	= 1.196 slat cr
1 acra	= 0.4047 ha	1 ha	= 2.471 acra
1 míle cr	= 2.590 km ²	1 km ²	= 0.3861 míle cr
1 orlach cr	= 6.452 cm ²	1 cm ²	= 0.1550 orlach cr

TOIRT

1 slat cb.	= 0.7646 m ³	1 m ³	= 1.308 slat cb.
1 orlach cb.	= 16.39 cm ³	1 cm ³	= 0.06102 orlach cb.
1 pionta	= 0.5682 l	1 l	= 1.760 pionta

MAIS

1 púnt	= 0.4536 kg	1 kg	= 2.205 púnt
1 tonna	= 1.016 t	1 t	= 0.9842 tonna

IMPERIAL-METRIC CONVERSION TABLE

LENGTH

1 yard	= 0.9144 m	1 m	= 1.094 yards
1 inch	= 2.54 cm	1 cm	= 0.3937 inches
1 mile	= 1.609 km	1 km	= 0.6214 miles

AREA

1 square yard	= 0.8361 m ²	1 m ²	= 1.196 square yards
1 acre	= 0.4047 ha	1 ha	= 2.471 acres
1 square mile	= 2.590 km ²	1 km ²	= 0.3861 square miles
1 square inch	= 6.452 cm ²	1 cm ²	= 0.1550 square inches

VOLUME

1 cubic yard	= 0.7646 m ³	1 m ³	= 1.308 cubic yards
1 cubic inch	= 16.39 cm ³	1 cm ³	= 0.06102 cubic inches
1 pint	= 0.5682 l	1 l	= 1.760 pints

MASS

1 pound	= 0.4536 kg	1 kg	= 2.205 pounds
1 ton	= 1.016 t	1 t	= 0.9842 tons

TÁBLA PEIREODACH NA nDÚL

PERIODIC TABLE OF THE ELEMENTS

1A	2A	3B	4B	5B	6B	7B	8						1B	2B	3A	4A	5A	6A	7A	0
1 H 1-0080																				2 He 4-003
3 Li 6-940	4 Be 9-013																			9 F 19-00
11 Na 22-997	12 Mg 24-32																			17 Cl 35-457
19 K 39-096	20 Ca 40-08	21 Sc 45-10	22 Ti 47-90	23 V 50-95	24 Cr 52-01	25 Mn 54-93	26 Fe 55-85	27 Co 58-94	28 Ni 58-69	29 Cu 63-54	30 Zn 65-38	31 Ga 69-72	32 Ge 72-60	33 As 74-91	34 Se 78-96	35 Br 79-916	36 Kr 83-7			
37 Rb 85-48	38 Sr 87-63	39 Y 88-92	40 Zr 91-22	41 Nb 92-91	42 Mo 95-95	43 Tc 99	44 Ru 101-7	45 Rh 102-91	46 Pd 106-7	47 Ag 107-880	48 Cd 112-41	49 In 114-76	50 Sn 118-70	51 Sb 121-76	52 Te 127-61	53 I 126-92	54 Xe 131-3			
55 Cs 132-91	56 Ba 137-36	57 La 138-92	72 Hf 178-6	73 Ta 180-88	74 W 183-92	75 Re 186-31	76 Os 190-2	77 Ir 193-1	78 Pt 195-23	79 Au 197-2	80 Hg 200-61	81 Tl 204-39	82 Pb 207-21	83 Bi 209-00	84 Po (210)	85 At (210)	86 Rn 222			
87 Fr (223)	88 Ra (226-05)	89 Ac (227)																		

Tá na Dúile Tearc-Chré agus na hActinidí fágtha ar lár.
The Rare Earth Elements and the Actinides have been omitted.

CÉAD-FHUINNIMH IANÚCHÁIN NA nDÚL

FIRST IONIZATION ENERGIES OF THE ELEMENTS
(in kiloJoules per mole)

1A	2A	3B	4B	5B	6B	7B	8						1B	2B	3A	4A	5A	6A	7A	0
H 1310																				He 2370
Li 519	Be 900																			9 F 1680
Na 494	Mg 736																			17 Cl 1260
K 418	Ca 590	Sc 632	Ti 661	V 649	Cr 653	Mn 715	Fe 761	Ni 736	Cu 745	Zn 908	Ag 732	Ga 577	Ge 761	As 967	Se 941	Br 1140	84 Kr 1350			
Rb 402	Sr 548	Y 636	Zr 669	Nb 653	Mo 695	Tc 699	Ru 724	Rh 745	Pd 803	Cd 866	In 556	Sn 707	Sb 833	Te 870	I 1010	86 Xe 1170				
Cs 377	Ba 502	La 540	Hf 531	Ta 577	W 770	Re 761	Os 841	Ir 887	Pt 866	Hg 1010	Tl 590	Pb 715	Bi 774	Po 812	At —	88 Rn 1040				
Fr —	Ra 510	Ac 669																		

Tá na Dúile Tearc-Chré agus na hActinidí fágtha ar lár.
The Rare Earth Elements and the Actinides have been omitted.

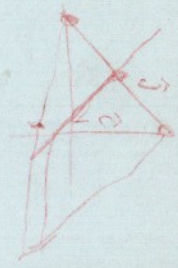
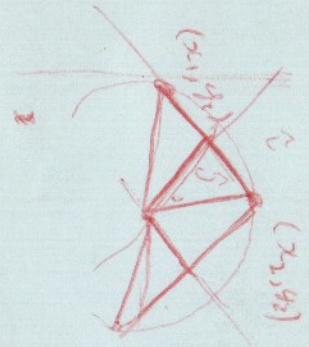
ELECTRONEGATIVITIES OF THE ELEMENTS

LEICTRIDHIŤLŤACHŤAĀ NA MŇŤ
 (Pauling)

	1A	2A	3B	4B	5B	6B	7B	8	1B	2B	3A	4A	5A	6A	7A	0
H	2.1															He
Li	1.0	Be									B	C	N	O	F	Ne
Na	0.9	Mg									Al	Si	P	S	Cl	Ar
K	0.8	Ca	Sc	Ti	V	Cr	Mn	Fe	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	0.8	Sr	Y	Zr	Nb	Mo	Tc	Ru	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	0.7	Ba	La-Lu	Hf	Ta	W	Re	Os	Au	Hg	Tl	Pb	Bj	Po	At	Rn
Fr	0.7	Ra	Ac	Th	Pa	U	Np-Lw									

To the Data Team: Chemists who have assigned values to the
 elements have been credited.

4/18



$x^2 + y^2 + ax + by + c = 0$

WAFJAM
DON 11
 (x_1, x_2, x_3)

$$\frac{x_1 + x_2}{2} +$$

$$\left(\frac{x_1 + x_2}{2} - (x_2 - x_1) \right) = 0$$

$$\frac{x_1 \cdot (x_2 - x_1)}{2} - \frac{(x_1 + x_2) \cdot (x_2 - x_1)}{2} = 0$$

$$x_1 \cdot (x_2 - x_1) + x_1^2 - x_2^2 = 0$$

$$x_1 \cdot (x_3 - x_2) + x_3^2 - x_2^2 = 0$$

$$x_1 \cdot (x_1 - x_3) + x_3^2 - x_1^2 = 0$$

$$(x_1 - x_2)(x_1 + x_2)$$



- $(0, 0)$
- (x_3, y_3)
- $(0, y_3)$

$$(x_3, y_3)$$

$$x_1 = \left(\frac{x_1}{2}, \frac{y_2}{2} \right)$$

$$\left(\frac{x_1 + x_2}{2} \right) (x_2 - x_1) = 0$$

$$x_1 \cdot x_2 - x_2 \cdot x_2 + x_2 \cdot x_1 = 0$$

$$x_1^2 - x_2^2$$

$$t = \frac{x_3^2 + y_3^2 - 4ax_3}{4}$$

$$a(x_3 - x_2) + b(y_3 - y_2) + c = 0$$

$$x_2^2 + y_2^2 - x_3^2 - y_3^2 = 0$$

E/007

