M. 5101/19.

Eötvös Loránd jegyzéki. Magnesse[illegible].

1 tétel fol. 1 bor.

M A
KIRA NC ÓR LÓ
1972 / 17 /

A könyvtári asztalról 1912 - június
18-ai eltett iratok.

Vegyes, régi ügyletek.

MAGYAR
TUDOMÁNYOS AKADÉMIA
KÖNYVTÁRA

Ms 5101/11

Ms 5101/11

$x \cos\varphi = 2$.

$x =$

$x = 2$

22,5 $x = 2{,}1647$.

45 $x = 2{,}8284$.

67,5 $x = 5{,}2260$.

Ad. mágnesség mérések

MAGYAR
TUDOMÁNYOS AKADÉMIA
KÖNYVTÁRA

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~~40,100253~~	~~66,833755~~	~~92,032031~~
~~40,222932~~	~~67,038220~~	~~92,316568~~
~~40,345611~~	~~67,242685~~	~~92,601105~~
~~40,468290~~	~~67,447150~~	~~92,885642~~
~~40,590969~~	~~67,651615~~	~~93,170179~~
~~40,713648~~	~~67,856080~~	~~93,454716~~
~~40,836327~~	~~68,060545~~	~~93,739253~~
~~40,959006~~	~~68,265010~~	~~94,023790~~
~~41,081685~~	~~68,469475~~	~~94,308327~~
~~41,204364~~	~~68,673940~~	~~94,592864~~
~~41,327043~~	~~68,878405~~	~~94,877401~~
~~41,449722~~	~~69,082870~~	~~95,161938~~
~~41,572401~~	~~69,287335~~	~~95,446475~~
~~41,695080~~	~~69,491800~~	~~95,731012~~
~~41,817759~~	~~69,696265~~	~~96,015549~~
~~41,940438~~	~~69,900730~~	~~96,300086~~
~~42,063117~~	~~70,105195~~	~~96,584623~~
~~42,185796~~	~~70,309660~~	~~96,869160~~
~~42,308475~~	~~70,514125~~	~~97,153697~~
~~42,431154~~	~~70,718590~~	~~97,438234~~
~~42,553833~~	~~70,923055~~	~~97,722771~~
~~42,676512~~	~~71,127520~~	~~98,007308~~
~~42,799191~~	~~71,331985~~	~~98,291845~~
~~42,921870~~	~~71,536450~~	~~98,576382~~
~~43,044549~~	~~71,740915~~	~~98,860919~~
~~43,167228~~	~~71,945380~~	~~99,145456~~
~~43,289907~~	~~72,149845~~	~~99,429993~~
~~43,412586~~	~~72,354310~~	~~99,714530~~
~~43,535265~~	~~72,558775~~	~~99,999067~~
~~43,657944~~	~~72,763240~~	~~100,283604~~
~~43,780623~~	~~72,967705~~	~~100,568141~~
~~43,903302~~	~~73,172170~~	~~100,852678~~
~~44,025981~~	~~73,376635~~	~~101,137215~~
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~~44,271339~~	~~73,785565~~	~~101,706289~~
~~44,394018~~	~~73,990030~~	~~101,990826~~
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~~44,884734~~	~~74,807890~~	~~103,128974~~
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~~45,743487~~	~~76,239145~~	~~105,120733~~
~~45,866166~~	~~76,443610~~	~~105,405270~~
~~45,988845~~	~~76,648075~~	~~105,689807~~
~~46,111524~~	~~76,852540~~	~~105,974344~~
~~46,234203~~	~~77,057005~~	~~106,258881~~
~~46,356882~~	~~77,261470~~	~~106,543418~~
~~46,479561~~	~~77,465935~~	~~106,827955~~
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~~46,724919~~	~~77,874865~~	~~107,397029~~
~~46,847598~~	~~78,079330~~	~~107,681566~~
~~46,970277~~	~~78,283795~~	~~107,966103~~
~~47,092956~~	~~78,488260~~	~~108,250640~~
~~47,215635~~	~~78,692725~~	~~108,535177~~
~~47,338314~~	~~78,897190~~	~~108,819714~~
~~47,460993~~	~~79,101655~~	~~109,104251~~
~~47,583672~~	~~79,306120~~	~~109,388788~~
~~47,706351~~	~~79,510585~~	~~109,673325~~
~~47,829030~~	~~79,715050~~	~~109,957862~~
~~47,951709~~	~~79,919515~~	~~110,242399~~
~~48,074388~~	~~80,123980~~	~~110,526936~~
~~48,197067~~	~~80,328445~~	~~110,811473~~
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~~48,565104~~	~~80,941840~~	~~111,665084~~
~~48,687783~~	~~81,146305~~	~~111,949621~~
~~48,810462~~	~~81,350770~~	~~112,234158~~
~~48,933141~~	~~81,555235~~	~~112,518695~~
~~49,055820~~	~~81,759700~~	~~112,803232~~
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~~49,301178~~	~~82,168630~~	~~113,372306~~
~~49,423857~~	~~82,373095~~	~~113,656843~~
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~~49,669215~~	~~82,782025~~	~~114,225917~~
~~49,791894~~	~~82,986490~~	~~114,510454~~
~~49,914573~~	~~83,190955~~	~~114,794991~~
~~50,037252~~	~~83,395420~~	~~115,079528~~
~~50,159931~~	~~83,599885~~	~~115,364065~~
~~50,282610~~	~~83,804350~~	~~115,648602~~
~~50,405289~~	~~84,008815~~	~~115,933139~~
~~50,527968~~	~~84,213280~~	~~116,217676~~
~~50,650647~~	~~84,417745~~	~~116,502213~~
~~50,773326~~	~~84,622210~~	~~116,786750~~
~~50,896005~~	~~84,826675~~	~~117,071287~~
~~51,018684~~	~~85,031140~~	~~117,355824~~
~~51,141363~~	~~85,235605~~	~~117,640361~~
~~51,264042~~	~~85,440070~~	~~117,924898~~
~~51,386721~~	~~85,644535~~	~~118,209435~~
~~51,509400~~	~~85,849000~~	~~118,493972~~
~~51,632079~~	~~86,053465~~	~~118,778509~~
~~51,754758~~	~~86,257930~~	~~119,063046~~
~~51,877437~~	~~86,462395~~	~~119,347583~~
~~52,000116~~	~~86,666860~~	~~119,632120~~
~~52,122795~~	~~86,871325~~	~~119,916657~~
~~52,245474~~	~~87,075790~~	~~120,201194~~
~~52,368153~~	~~87,280255~~	~~120,485731~~
~~52,490832~~	~~87,484720~~	~~120,770268~~
~~52,613511~~	~~87,689185~~	~~121,054805~~
~~52,736190~~	~~87,893650~~	~~121,339342~~
~~52,858869~~	~~88,098115~~	~~121,623879~~
~~52,981548~~	~~88,302580~~	~~121,908416~~
~~53,104227~~	~~88,507045~~	~~122,192953~~
~~53,226906~~	~~88,711510~~	~~122,477490~~
~~53,349585~~	~~88,915975~~	~~122,762027~~
~~53,472264~~	~~89,120440~~	~~123,046564~~
~~53,594943~~	~~89,324905~~	~~123,331101~~
~~53,717622~~	~~89,529370~~	~~123,615638~~
~~53,840301~~	~~89,733835~~	~~123,900175~~
~~53,962980~~	~~89,938300~~	~~124,184712~~
~~54,085659~~	~~90,142765~~	~~124,469249~~
~~54,208338~~	~~90,347230~~	~~124,753786~~
~~54,331017~~	~~90,551695~~	~~125,038323~~
~~54,453696~~	~~90,756160~~	~~125,322860~~
~~54,576375~~	~~90,960625~~	~~125,607397~~
~~54,699054~~	~~91,165090~~	~~125,891934~~
~~54,821733~~	~~91,369555~~	~~126,176471~~
~~54,944412~~	~~91,574020~~	~~126,461008~~
~~55,067091~~	~~91,778485~~	~~126,745545~~
~~55,189770~~	~~91,982950~~	~~127,030082~~
~~55,312449~~	~~92,187415~~	~~127,314619~~
~~55,435128~~	~~92,391880~~	~~127,599156~~
~~55,557807~~	~~92,596345~~	~~127,883693~~
~~

1,01
0,004321
0,002161

0,006483 0,010805 0,015127.
0,993517-1 0,989195-1 0,984873-1

0,6
009
591

$\frac{2}{2\frac{1}{2}}$

$\left(\frac{1}{2\frac{1}{2}}\right)$ 0,5

1,698970-2

0,849485-1

0,548455-1

0,247425-1 0,946395-2

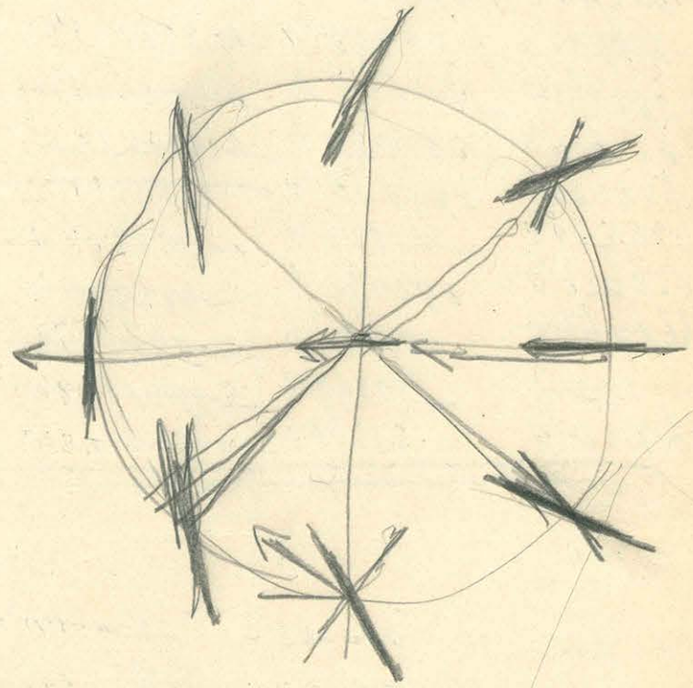
$\left(\frac{1}{1,2}\right)^{\frac{2}{2}}$ 0,

31,623

0,03160

$\frac{96}{88}$

0,010



$P = 0,5\,\text{mg}$.

$\sqrt{1-s^2}$

$a = x^2+z^2$

$\varphi = \alpha$

~~2,44~~									
2,96	2,44	0,387390	0,193695	0,581085	~~0,418915-1~~	0,968475	~~0,031525-1~~	1,355865	0,644135-2
	2,96	0,471292	0,235646	0,706938	~~0,293062-1~~	1,178230	~~0,821770-2~~	1,649522	0,350478-2
	3,56	0,551450	0,275725	0,827175	~~0,172825-1~~	1,378625	~~0,621375-2~~	1,930075	0,069925-2
	4,24	0,627366	0,313683	0,941049	~~0,058951-1~~	1,568415	~~0,431585-2~~	2,195781	0,804219-3
	5,00	0,698970	0,349485	1,048455	~~0,951545-2~~	1,744725	~~0,255275-2~~	2,446395	~~0,553605-3~~
	5,84	0,766413	0,383207	1,149615	~~0,850385-2~~	1,916025	~~0,083975-2~~	2,682435	~~0,317565-3~~
	6,76	0,829947	0,414974	1,244922	~~0,755078-2~~	2,074870	~~0,925130-3~~	2,904818	~~0,095182-3~~
	7,76	0,889862	0,444931	1,334793	~~0,665207-2~~	2,224655	~~0,775345-3~~	3,114517	~~0,885483-4~~
	8,84	0,946452	0,473226	1,419678	~~0,580322-2~~	2,366130	~~0,633870-3~~	3,312582	0,687418-4
	10,00	1,000000	0,500000	1,500000	~~0,500000-2~~	2,500000	0,500000-3	3,500000	0,500000-4
	11,24	1,050766	0,525383	1,576149	~~0,423851-2~~	2,626915	~~0,375085-3~~	3,677681	~~0,322319-4~~
	12,56	1,098990	0,549495	1,648485	~~0,351515-2~~	2,747475	~~0,252525-3~~	3,846465	~~0,153535-4~~
	13,96	1,144885	0,572443	1,717329	~~0,282671-2~~	2,862215	~~0,137785-3~~	4,007101	~~0,992899-5~~
	15,44	1,188647	0,594324	1,782972	~~0,217028-2~~	2,971620	~~0,028380-3~~	4,160268	0,839732-5
	17,00	1,230449	0,615225	1,845675	~~0,154325-2~~	3,076125	~~0,923875-4~~	4,306575	0,693425-5
	18,64	1,270446	0,635223	1,905669	~~0,094331-2~~	3,176115	~~0,823885-4~~	4,446561	0,553439-5
	20,36	1,308778	0,654389	1,963167	~~0,036833-2~~	3,271945	~~0,728055-4~~	4,580723	0,419277-5
	22,16	1,345570	0,672785	2,018355	~~0,981645-3~~	3,363925	~~0,636075-4~~	4,709495	0,290505-5
	24,04	1,380934	0,690467	2,071401	~~0,928599-3~~	3,452335	~~0,547665-4~~	4,833269	0,166731-5
	26,00	1,414973	0,707487	2,122461	~~0,877539-3~~	3,537435	~~0,462565-4~~	4,952409	0,047591-5

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

1,249712	1,506803	1,506803	1,481471	1,581677	1,581677
0,447158	1,249712	0,447158	1,318063	1,481471	1,318063
0,802554	0,257091	1,059645	0,163408	0,100206	0,263614

1) $\varphi_1 - \varphi_2 = -17^\circ 8' 10''$.

Pge

φ_1

0,980280-1
0,049439
0,029719
+1,07083
0,54448
+1,61531

2,122544
1,249712
0,177727-1
2,549983

φ_2

0,469296-1
0,266692
0,735988-1
±0,54448
2,549983 -
0,208253
2,341730
2,758236
+573,108.

X

0,469296-1
0,049439
0,518735-1
-0,330168

0,980280-1
0,266692
0,246972
+1,76593.
0,33017
+1,43576

0,157080.
2,549983
2,707063
+509,405.

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

2.) PCO. $\varphi - \gamma_1 = +17^\circ\ 8'\ 10''$

Σ

0,980280-1
0,559835-1
0,540115-1

+0,34683.
17442
+0,17241

2,122544.
1,506803
0,576140-1
3,205487
0,236562-1
2,442049

0,469296-1
0,772306-1
0,241602-1

− 0,17422

276,725

X

0,469296-1
0,559835-1
0,029131-1

+0,106938.
565700
+0,672638

3,205487
0,827783-1
3,033270

0,980280-1
0,772306-1
0,752586-1

+0,565700

1079,62

PE

256
59,804
315,804

2,499412
$\log r_1 = 1,249706$

0,888365
1,249706
0,638659-1

$r_1 = PD = 17,7708$ $r_2 = PE = 2,8.$ $\varphi_1 = +25°47'45''.$

$\alpha = 64°12'15'' = 1,120541.$ $\omega_1 = PDE_1 = 8°39'35''.$

1,117010
3490
7
27
1,120541.

72° 51' 50"
64° 12' 15"
8° 39' 35"

PCD.

~~0,447158~~

7,84
1024.
1031,84.

3,013596
1,506798 = $\log r_1$

$r_1 = PC = 32,1217$ $r_2 = PD = 17,7708.$

$\varphi_1 = + 5° 0' 4''.$

0,447158
1,506798
0,940360-2

$\alpha = 20°47'41'' = 0,3629364.$

64°12'15"
5° 0' 4"
69°12'19"

0,3490659
136714
1988
0,3629364

$\omega_1 = 22°8'14''$

5° 0' 4"
17° 8' 10"
22° 8' 14"

PCE

$r_1 = PC = 32,1217$ $r_2 = PE = 2,8.$

$\varphi_1 = + 5° 0' 4''$ $\alpha = 84°59'56'' = 1,483505.$

$\omega_1 = \varphi_1 = 5° 0' 4''$

1,466076
17624
2715
1,483505

PLK. $r_1 = PL = 30,3019$ $r_2 = PK = 20,8$

256
662,203
918,203

2,962937
1,481469 = $\lg r_1$

1,410495
1,481469
0,929026-1.

$\varphi_1 = +58°7'40''$ $\alpha = 31°52'20'' = 0,5562753.$

0,5410521
151262
970
0,5562753

$\omega_1 = 40°59'30''$

72°51'50''
31°52'20''
40°59'30''

PML. $r_1 = PM = 38,1659$ $r_2 = PL = 30,3019.$

$\varphi_1 = +33°1'25''$

432,64
1024
1456,64

3,163352
1,581676 = $\lg r_1$

1,318063
1,581676
0,736387-1

33°1'25''
31°52'20''
64°53'45''

0,4363323
17453
727
0,4381503

17°8'10''
33°1'25''
50°9'35''

$\alpha = 25°6'15'' = 0,1381503.$

$\omega_1 = 50°9'35''.$

PKM. $r_1 = PM = 38,1659.$ $r_2 = PK = 20,8.$

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

$\varphi_1 = +33°1'25''$ $\alpha = 56°58'35'' = 0,9944256.$

0,9773844
168715
1697
0,9944256

$\omega_1 = \varphi_1 = 33°1'25''$

+4° 17' 20	+90°	+4° 17' 20	+90°	+17° 8' 10"	-17° 8' 10"	-90°	-90°	0
0,874250-2	0,573800+2	0,573800-2	0,968670+2	0,922440-1	0,282826	0,274735-1	0,874250-2	0,440027
0,873817-2	0	0,873817-2	0	0,469296-1	0,469296-1	0		
0,748067-3		0,447617-3		0,391736-1	0,752122-1			
−		−		+	+			
0,998782-1		0,998782		0,980280-1	0,980280-1			
0,839101-1		0,841234-1		0,918397-1	0,205204-1			
0,837883-1		0,840616		0,898677-1	0,185484-1			
+ 0,005598	+ 0,037480	+ 0,002803	+ 0,093040	+ 0,246454	− 0,565095	− 0,188250	− 0,748600	0
+ 0,688467	0	+ 0,691957	0	+ 0,791911-1	− 0,153279	0	0	+ 0,66884
+ 0,694065	+ 0,037480	+ 0,694760	+ 0,093040	+ 1,038365	− 0,718374	− 0,188250	− 0,748600	+ 0,66884
0,841403-1	0,573800-2	0,829149-1	0,968670-2	0,076365	0,856348-1	0,274735-1	0,874250-2	0,825026-1
0,173629-1		0,873817-2	0,999695-1	0,619616-1	0,791917-1	0,985530-1	0,998782-1	0,114416-1
0,728216	1,329052	1,028042	1,329357	1,332762	0,978251	1,042497	1,029262	1,332762
2,122544	2,122544	2,122544	2,122544	2,122544	2,122544	2,122544	2,122544	2,122544
1,865792	2,025396	1,853552	2,420266	3,091287	2,743660	2,425306	2,024838	2,394758
X=+43,4162	+106,022	+71,376	+263,188	+1233,920	− 554,191	− 266,260	− 105,8859	+ 248,175.

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

-6,0		-18,0	+72,00	+216	+258
-5,0		-15,0	+50,00	+125	+188
-4,0		-12,0	+32,00	+64	+82
-3,0		-9,0	+18,00	+27	+34
-2,0	+00	-6,0	+8,00	+8	+8,00
-1,0	1752,00	-3,0	+2,00	+1,00	-2,000
-0,9		-2,7	+1,62	+0,729	-2,354
-0,8	2,000	-2,4	+1,28	+0,512	-2,648
-0,7		-2,1	+0,98	+0,343	-2,777
-0,6		-1,8	+0,72	+0,216	-2,864
-0,5		-1,5	+0,50	+0,125	-2,875
-0,4	-1,1	-1,2	+0,32	+0,064	-2,876
-0,3	-0,9	-0,9	+0,18	+0,027	-2,693
-0,2	-0,6	-0,6	+0,02	+0,008	-2,572
-0,1	-0,3	-0,3	+0,02	+0,001	-2,279
0	0	0	0	+ 0	0 -2
+0,1			+0,2	+ 0,02	-0,001 -1,681
+0,2			+0,6	+ 0,08	-0,008 1,488
+0,3			+0,8	+ 0,18	-0,027
+0,4			+1,2	+ 0,32	-0,064
+0,5			+1,5	+ 0,50	-0,125 -0,125
+0,6			+1,8	+ 0,72	-0,216 +0,304
+0,7			+2,1	+ 0,98	-0,243
+0,8			+2,4	+ 1,28	-0,512
+0,9			+2,7	+ 1,62	-0,729
+1,0			+3,0	+ 2,00	-1,00 +2,00
+2,0			+6,0	+ 8,00	- 8 +4,00
+3,0			+9,0	+ 18,00	- 27 -2,00
+4,0			+12,0	+ 32,00	- 64 -22,00
+5,0			+15,0	+ 50,00	- 125 -58,00
+6,0			+18,0	+ 72,00	- 216 -128,00

$\frac{1}{8}$ $-2,349$ $\frac{7}{3}$

$\frac{1}{8}$

$\frac{S}{h} = (0,)\,h$ ( ) ( ) ( )

2

0

22,5

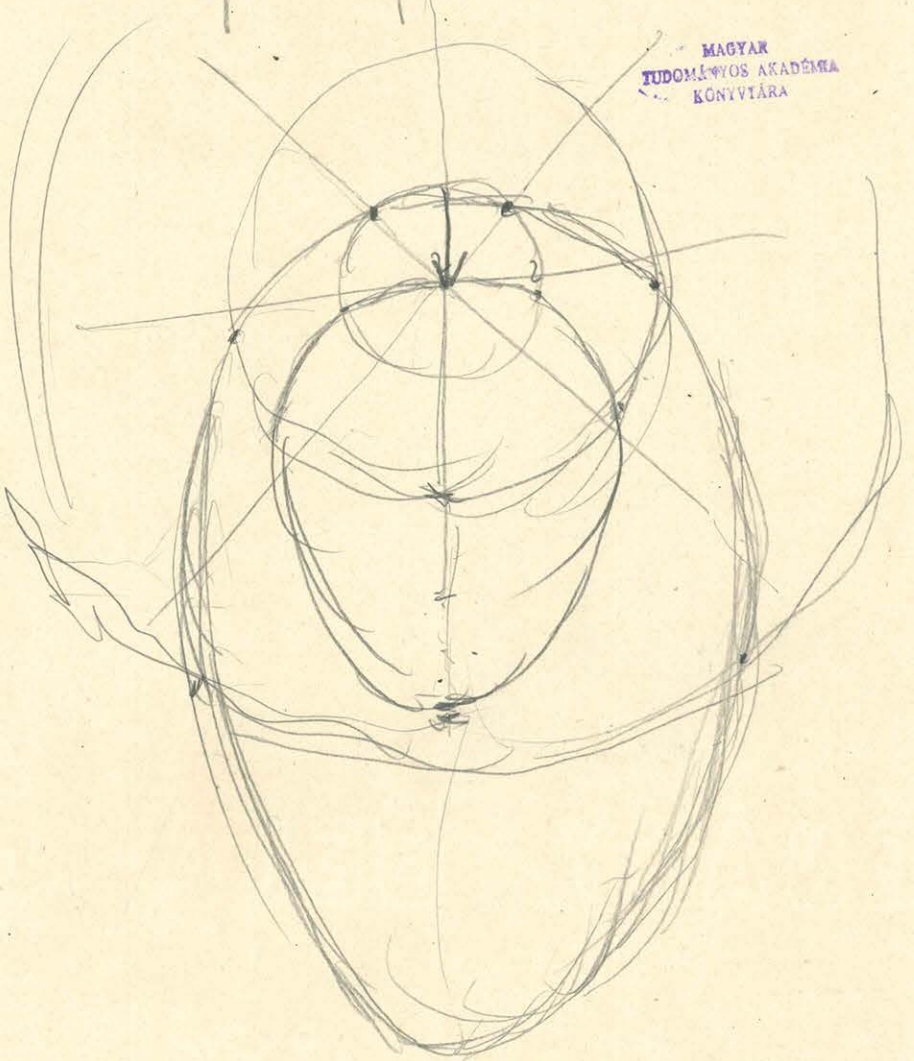
45

67,5

90

112,5

1



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KÖNYVTÁRA

1912 április

Kontinuitási egyenlet

$$\frac{\partial \varrho}{\partial t} + \frac{\partial \varrho u}{\partial x} + \frac{\partial \varrho v}{\partial y} + \frac{\partial \varrho w}{\partial z} = 0$$

Potential

$r^2 = \varrho^2 + h^2$

~~$\varphi = \alpha \kappa Q$~~

y 1) $u = -\kappa Q \cos\varphi \frac{\varepsilon x}{r^3} + \kappa Q v \frac{h}{r^3}$

$P_\varrho =$

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$$u = +\alpha \kappa Q \frac{\varepsilon x}{r^3} + \gamma \kappa Q \frac{h}{r^3}$$

$$P_\varrho = +\alpha \kappa Q \frac{3 r^2 \varrho z}{r^5} - \gamma \kappa Q \frac{3 h \varrho}{r^5}$$

$$P_n = -\beta \kappa Q \frac{\varepsilon x}{r}$$

1,200
72
1,128

27

64
5
576

1,800
240
1,557

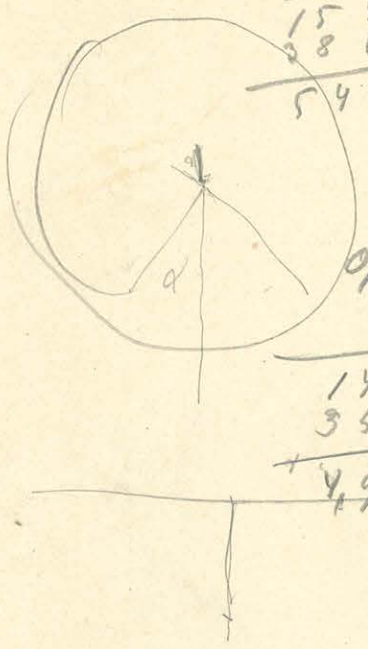
125
1,125

2,400
576
1824

3,000
1125
1875

3.6
3,600
1944
1,656
1

21,600



$$U = \kappa V Q \left(\frac{h}{(\rho^2+h^2)^{\frac{3}{2}}} + \frac{M}{V}\cos\alpha \frac{\rho}{(\rho^2+h^2)^{\frac{3}{2}}} \right)$$

$U = 0$ ha $\alpha = \pi$ és

$$h - \frac{M}{V}\rho = 0$$

$$\rho = \frac{V}{M} h$$

$$\frac{\rho}{h} = \frac{3}{2}\frac{V}{M\cos\alpha} + \sqrt{2 + \frac{9}{4}\frac{V^2}{M^2\cos^2\alpha}}$$

$$\frac{V}{M} = 2, \quad \cos\alpha = +1$$

$$\frac{\rho}{h} = 3 + \sqrt{11} = 6{,}3166$$

$$\rho = \frac{h}{6{,}3166}$$

$$\frac{1}{\rho} = x$$

$$-3x + \frac{M}{V}\cos\alpha\, x^2 + \frac{M}{V}\cos\alpha - 3\frac{M}{V}\cos\alpha = 0$$

$$x^2 - 3\frac{V}{M\cos\alpha}x = 2$$

$$x = +\frac{3}{2}\frac{V}{M\cos\alpha} \pm \sqrt{2 + \frac{9}{4}\frac{V^2}{M^2\cos^2\alpha}}$$

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Homogén mágnesezésű golyóra a mágneses

$u \times \frac{\partial^2 u}{\partial x^2} - \frac{\partial^2 u}{\partial y^2}$ és $\frac{\partial^2 u}{\partial x \partial y}$.

~~A gyűjtőlencsének~~ annak $a=0$ $b=0$ $c=1$. A gyűjtő lényeg.

~~Vissza~~

1) $$u = -\alpha k Q \frac{x}{((x^2+y^2+(h-2)^2)^{\frac{3}{2}}} + \beta k Q \frac{y}{(x^2+y^2+(h-2)^2)^{\frac{3}{2}}} + \gamma k Q \frac{h-2}{(x^2+y^2+(h-2)^2)^{\frac{3}{2}}}$$

$x^2+y^2+(h-2)^2 = r^2$

~~Vissza~~

2)
$$\begin{cases} X = \alpha k Q \left(-\frac{1}{r^3} + 3\frac{x^2}{r^5}\right) + \beta k Q \frac{3xy}{r^5} + \gamma k Q \frac{3(h-2)x}{r^5} \\ Y = +\alpha k Q \frac{3xy}{r^5} + \beta k Q \left(-\frac{1}{r^3} + 3\frac{y^2}{r^5}\right) + \gamma k Q \frac{3(h-2)y}{r^5} \end{cases}$$

3)
$$\begin{cases} \frac{\partial X}{\partial x} = \alpha k Q \left(\frac{9x}{r^5} - 15\frac{x^3}{r^7}\right) + \beta k Q \left(\frac{3y}{r^5} - 15\frac{x^2 y}{r^7}\right) + \gamma k Q \left(\frac{3(h-2)}{r^5} - 15\frac{x^2(h-2)}{r^7}\right) \\ \frac{\partial Y}{\partial y} = \alpha k Q \left(\frac{3x}{r^5} - 15\frac{y^2 x}{r^7}\right) + \beta k Q \left(\frac{9y}{r^5} - 15\frac{y^3}{r^7}\right) + \gamma k Q \left(\frac{3(h-2)}{r^5} - 15\frac{y^2(h-2)}{r^7}\right) \\ \frac{\partial X}{\partial y} = \alpha k Q \left(\frac{3y}{r^5} - 15\frac{x^2 y}{r^7}\right) + \beta k Q \left(\frac{3x}{r^5} - 15\frac{y^2 x}{r^7}\right) + \gamma k Q 15\frac{(h-2)xy}{r^7} \end{cases}$$

ha $y = 0$ akkor és $z = 0$

$r^2 = x^2 + h^2$

---

1) $$u = -\alpha k Q \frac{x}{r^3} + \gamma k Q \frac{h}{r^3}$$

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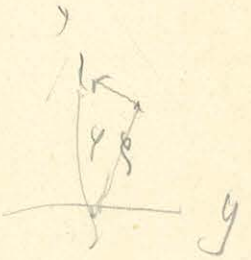
2)
$$\begin{cases} X = \alpha k Q \frac{2x^2 - h^2}{r^5} + \gamma k Q \frac{3hx}{r^5} \\ Y = -\beta k Q \frac{1}{r^3} \end{cases}$$

X a mágnes mágneses vonalára



3)
$$\begin{cases} \frac{\partial X}{\partial x} - \frac{\partial Y}{\partial y} = \alpha k Q \left(\frac{6x}{r^5} - \frac{15x^3}{r^7}\right) - \gamma k Q \frac{15hx^2}{r^7} \\ \frac{\partial X}{\partial y} = \beta k Q \frac{3x}{r^5} \end{cases}$$

$a = h$

x helyén $- \xi$

y helyén $- \eta$

$\alpha = -M \cos\varphi$

$\beta = +M \sin\varphi$

$\gamma = M$

$$\xi = \rho \cos\alpha \sin\varepsilon$$

$$\zeta = \rho \cos\alpha \cos\varepsilon$$

$$\frac{\cos^2\alpha \sin^2\varepsilon + 2\frac{h}{\rho}\cos\alpha\sin\varepsilon}{1+\frac{h^2}{\rho^2}}$$

$$\sin\varepsilon \frac{\sin\varepsilon + 2\frac{h}{\rho}}{1+\frac{h^2}{\rho^2}}$$

$$\rho = \infty \qquad \sin^2\varepsilon$$

$$\rho = 0 \qquad 0$$

$$\frac{1}{10} \quad \frac{\frac{3}{5}}{1}$$

$$\sin\varepsilon \frac{\rho^2 + 3\sin^2\varepsilon + 2h\rho}{\rho^2+h^2}$$

$$\frac{\partial^2 U}{\partial x \partial z} = z/\sigma$$

$$\rho^2 + h^2 - 2h\xi + \xi^2$$

$$\frac{3}{2}\cdot\frac{1}{2}$$

$$\frac{3}{4} \qquad \frac{9}{8}\cdot\frac{7}{6}$$

$$\frac{\partial^2 U}{\partial x \partial z} = 3/\sigma \frac{\rho^2 d\rho}{(\rho^2+h^2)^{\frac{5}{2}}} \frac{(h-\xi)\cos\alpha\, d\alpha\, d\xi}{\left(1+\frac{\xi^2-2h\xi}{\rho^2+h^2}\right)^{\frac{5}{2}}}$$

$$\frac{105}{48}\cdot\frac{9}{8}$$

$$\cos\alpha = x$$

$$d\alpha = -\frac{dx}{\sqrt{1-x^2}}$$

$$\frac{x\,dx}{\sqrt{(1-x^2)(\rho^2+dx+px^2)}}$$

$$h-\xi = x \qquad d\xi - dx$$

$$\frac{\partial^2 U}{\partial x \partial z} = +\,3/\sigma \rho^2 d\rho \frac{\cos\alpha\, d\alpha}{(\rho^2+(h-\xi)^2)^{\frac{5}{2}}}$$

$$\frac{\partial^2 U}{\partial x \partial z} = 15\rho^2 d\rho$$

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$$h\xi - h\frac{\xi^2}{2}$$

$$\frac{\partial^2 U}{\partial x \partial z} = +\frac{15\rho^2 d\rho}{(\rho^2+h^2)^{\frac{5}{2}}}\cos\alpha\, d\alpha \frac{1}{\left(1+\frac{\xi^2-2h\xi}{\rho^2+h^2}\right)^{\frac{5}{2}}}$$

$$\frac{1}{(1+x)^{\frac{5}{2}}} = 1 - \frac{5}{2}x + \frac{15}{8}x^2 - \frac{105}{48}x^3 + \frac{945}{384}x^4 - \cdots$$

$$\frac{1}{(1+x)^{\frac{3}{2}}} = 1 - \frac{3}{2}x + \frac{15}{8}x^2 - \frac{105}{48}x^3 + \frac{315}{384}x^4 \qquad x = \frac{\xi^2 - 2h\xi}{\rho^2+h^2}$$

$$\frac{3}{2}x = \frac{1}{\rho^2+h^2}\frac{3}{2}\left(\rho^2\xi^2\cos^2\alpha - 2h\rho\xi\cos\alpha\right) \qquad \xi = \rho\xi\cos\alpha$$

$\xi = \sin\xi$ - nél sokkal kisebb szám

$$\frac{15}{8}x^2 = \frac{1}{(\rho^2+h^2)^2}\frac{15}{8}\left(\rho^4\xi^4\cos^4\alpha + 4h^2\rho^2\xi^2\cos^2\alpha - 4h\rho^3\xi^3\cos^3\alpha\right)$$

$$\frac{105}{48}x^3 = \frac{1}{(\rho^2+h^2)^3}\frac{35}{16}\left(\rho^6\xi^6\cos^6\alpha - 8h\rho^5\xi^5\cos^5\alpha + 12h^2\rho^4\xi^4\cos^4\alpha\right.$$

$$\left.\frac{315}{128}x^4 = \frac{1}{(\rho^2+h^2)^4}\frac{315}{128}\left(\underline{32\,h^3\rho^5\xi^5\cos^2\alpha} \text{ és ennél nagyobb kitevők}\right)\right)$$

$$\frac{1}{\rho}\frac{\partial^2 u}{\partial x\,\partial z} = +3\pi\frac{h\rho^3 d\rho}{(\rho^2+h^2)^{\frac{7}{2}}}\xi - \frac{45}{8}\pi\frac{h\rho^5 d\rho}{(\rho^2+h^2)^{\frac{7}{2}}}\xi^3 - \frac{105}{8}\pi\frac{h^3\rho^5 d\rho}{(\rho^2+h^2)^{\frac{9}{2}}}\xi^3 - \frac{525}{64}\pi\frac{h\rho^7 d\rho}{(\rho^2+h^2)^{\frac{9}{2}}}\xi^5 - \frac{1575}{32}\pi\frac{h^3\rho^7 d\rho}{(\rho^2+h^2)^{\frac{11}{2}}}\xi^5 -$$

$$\int\frac{\rho^3 d\rho}{(\rho^2+h^2)^{\frac{5}{2}}} = \left(-\rho^2 - \frac{2}{3}h^2\right)\frac{1}{(\rho^2+h^2)^{\frac{3}{2}}} + \frac{2}{3}\frac{1}{h} = \frac{2}{3}\frac{1}{h} - \frac{1}{3}\frac{3\rho^2+2h^2}{(\rho^2+h^2)^{\frac{3}{2}}}$$

$$\int\frac{\rho^5 d\rho}{(\rho^2+h^2)^{\frac{7}{2}}} = \left(-\rho^4 - \frac{4}{5}h^2\rho^2 - \frac{8}{15}h^4\right)\frac{1}{(\rho^2+h^2)^{\frac{5}{2}}} + \frac{8}{15}\frac{1}{h} = \frac{8}{15}\frac{1}{h} - \frac{1}{15}\frac{15\rho^4+20h^2\rho^2+8h^4}{(\rho^2+h^2)^{\frac{5}{2}}}$$

$$\int\frac{\rho^5 d\rho}{(\rho^2+h^2)^{\frac{9}{2}}} = \left(-\frac{\rho^4}{3} - \frac{4}{15}h^2\rho^2 - \frac{8}{105}h^4\right)\frac{1}{(\rho^2+h^2)^{\frac{7}{2}}} + \frac{8}{105}\frac{1}{h^3} = \frac{8}{105}\frac{1}{h^3} - \frac{1}{105}\frac{35\rho^4+28h^2\rho^2+8h^4}{(\rho^2+h^2)^{\frac{7}{2}}}$$

$$\int\frac{\rho^7 d\rho}{(\rho^2+h^2)^{\frac{9}{2}}} = \left(-\rho^6 - 2h^2\rho^4 - \frac{8}{5}h^4\rho^2 - \frac{16}{35}h^6\right)\frac{1}{(\rho^2+h^2)^{\frac{7}{2}}} + \frac{16}{35}\frac{1}{h} = \frac{16}{35}\frac{1}{h} - \frac{1}{35}\frac{35\rho^6+70h^2\rho^4+56h^4\rho^2+16h^6}{(\rho^2+h^2)^{\frac{7}{2}}}$$

$$\frac{\partial^2 u}{\partial x\,\partial z} = +\int\frac{\rho^2 d\rho}{(\rho^2+h^2)^{\frac{5}{2}}}\cos\alpha d\alpha\,\frac{1}{(1+x)^{\frac{3}{2}}}$$

$$\int_0^{2\pi}\cos^2\alpha\,d\alpha = \pi$$

$$\int_0^{\pi}\cos^4\alpha\,d\alpha = \frac{3}{4}\pi$$

$$\int_0^{2\pi}\cos^6\alpha\,d\alpha = \frac{5}{8}\pi$$

$$\int_0^{\pi}\cos^8\alpha\,d\alpha = \frac{35}{64}\pi$$

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$$\int \frac{\varrho^4 d\varrho}{(\varrho^2+h^2)^{\frac{11}{2}}} = \left(-\frac{1}{3}\varrho^6 - \frac{2}{5}h^2\varrho^4 - \frac{8}{35}h^4\varrho^2 - \frac{16}{315}h^6\right)\frac{1}{(\varrho^2+h^2)^{\frac{9}{2}}} + \frac{16}{315}\frac{1}{h^3} = \frac{16}{315}\frac{1}{h^3} - \frac{1}{315}\frac{105\varrho^6+126h^2\varrho^4+72h^4\varrho^2+16h^6}{(\varrho^2+h^2)^{\frac{9}{2}}}$$

$$\frac{\partial^2 U}{\partial x \partial z} = 2\pi f\sigma\left[\left(1-\frac{h}{2}\frac{3\varrho^2+2h^2}{(\varrho^2+h^2)^{\frac{3}{2}}}\right)\sin\varepsilon - \left(\frac{\pi}{2}-\frac{h}{16}\frac{45\varrho^6+140h^2\varrho^4+112h^4\varrho^2+32h^6}{(\varrho^2+h^2)^{\frac{7}{2}}}\right)\sin^3\varepsilon - \left(\frac{25}{8}-\frac{5h}{128}\frac{105\varrho^8+525h^2\varrho^6+630h^4\varrho^4+360h^6\varrho^2+80h^8}{(\varrho^2+h^2)^{\frac{9}{2}}}\right)\sin^5\varepsilon + \dots\right] + \dots$$

2π

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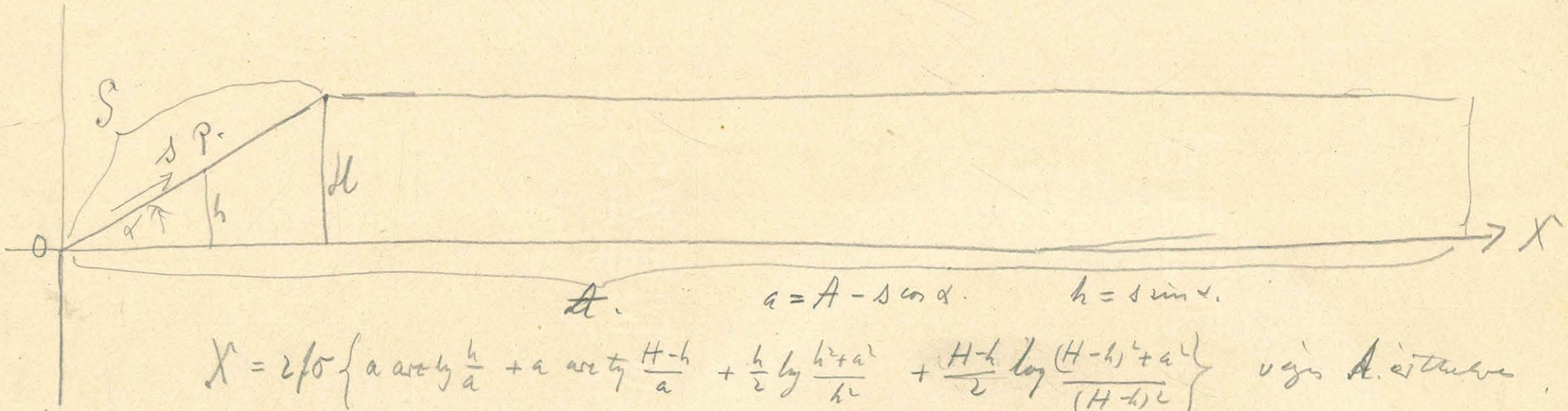

A. $\quad a = A - s\cos\alpha \qquad h = s\sin\alpha$.

$$X = 2f\sigma\left\{ a \operatorname{arctg}\frac{h}{a} + a \operatorname{arctg}\frac{H-h}{a} + \frac{h}{2}\log\frac{h^2+a^2}{h^2} + \frac{H-h}{2}\log\frac{(H-h)^2+a^2}{(H-h)^2}\right\}$$ vagis A. eltunese.

Z.

$$\frac{\partial X}{\partial s} = 2f\sigma\sin\alpha\left(\frac{1}{2}\log\frac{h^2+(A-s\cos\alpha)^2}{(H-h)^2+(A-s\cos\alpha)^2} - \frac{1}{2}\log\frac{h^2}{(H-h)^2}\right) - 2f\sigma\cos\alpha\left(\operatorname{arctg}\frac{h}{a} + \operatorname{arctg}\frac{H-h}{a}\right).$$

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ha $\underline{A=\infty}$ akkor $\dfrac{\partial X}{\partial s} = 2f\sigma\sin\alpha\log\dfrac{S-s}{s}$

Ha $A=\infty$ akkor

$$Z = 2f\sigma(k\pi - H\alpha)$$

és $\dfrac{\partial Z}{\partial s} = 2f\sigma\pi\sin\alpha$.

ha $A=\infty$

$$\frac{\partial Z}{\partial x} = 2f\sigma\left(\frac{\pi}{2}\sin 2\alpha - \sin^2\alpha\log\frac{S-s}{s}\right)$$

$$\frac{\partial X}{\partial x} = -\frac{\partial Z}{\partial z} = 2f\sigma\left(\pi\sin^2\alpha + \frac{\sin 2\alpha}{2}\log\frac{S-s}{s}\right)$$

$$2\pi\varepsilon - 3\pi\varepsilon^3 - \frac{15}{4}\pi\varepsilon^5$$
$$= \pi\varepsilon^3 - \frac{5}{2}\pi\varepsilon^5$$

$$+\left(2\pi\varepsilon - 4\pi\varepsilon^3 - \frac{25}{4}\pi\varepsilon^5\right)$$

$$-\left(\pi h \frac{3\rho^2-2h^2}{(\rho^2+h^2)^{\frac{3}{2}}}\varepsilon + \frac{3}{8}\pi h \frac{15\rho^4+20\rho^2h^2+8h^4}{(\quad)^{\frac{5}{2}}}\varepsilon^3 + \frac{15}{64}\pi h \frac{35\rho^6+70h^2\rho^4+56h^4\rho^2+16h^6}{(\quad)^{\frac{7}{2}}}\varepsilon^5\right.$$
$$\left. + \frac{1}{8}\pi h \frac{35\rho^4h^2+28h^4\rho^2+8h^6}{(\quad)^{\frac{7}{2}}}\varepsilon^3 + \frac{10}{64}\pi h \frac{105h^2\rho^6+126h^4\rho^4+72h^6\rho^2+16h^8}{(\quad)^{\frac{9}{2}}}\varepsilon^5\right)$$

$$\frac{1}{8}\pi h\Big|\begin{array}{l} 45\rho^6+60\rho^4h^2+24\rho^2h^4 \\ +45\rho^4h^2+60\rho^2h^4+24h^6 \\ +35\rho^4h^2+28\rho^2h^4+8h^6 \end{array}$$

$$\frac{\pi}{8}h\left(\frac{45\rho^6+140\rho^4h^2+112\rho^2h^4+32h^6}{(\quad)^{\frac{7}{2}}}\right)\varepsilon^3$$

$$\frac{5}{64}\pi h\left(\begin{array}{l} 105\rho^8+210h^2\rho^6+168h^4\rho^4+48h^6\rho^2 \\ +105h^2\rho^6+210h^4\rho^4+168h^6\rho^2+48h^8 \\ +210h^2\rho^6+252h^4\rho^4+144h^6\rho^2+32h^8 \end{array}\right)$$

$$\frac{5}{64}\pi h\left(105\rho^8+525h^2\rho^6+630h^4\rho^4+360h^6\rho^2+80h^8\right)$$

$$(1-\nu)$$

$$-(2+\nu)\sin^2\varepsilon$$

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$\rho = 4$

$$2\pi/\omega \Big/ \left(1 - \frac{1}{5{,}6568}\right)\sin\varepsilon - \left(2 + \frac{329}{187{,}0192}\right)\sin^3\varepsilon - \left(\frac{25}{8} + \frac{8500}{2896{,}3072}\right)\sin^5\varepsilon$$

$\frac{1}{10}$ $\frac{2}{10}$ $\frac{4}{1000}$ $\frac{82}{10000}$ $\frac{6}{100000}$ $\frac{192}{100000}$

$\frac{400}{128}$ $\frac{50}{16}$ $\frac{25}{8}$

$\frac{1}{10} \cdot \frac{1}{5000} = \frac{1}{5}$

$\rho = 10$ $\frac{1}{2}\frac{302}{(101)^{\frac{3}{2}}}$

$\rho = 20$ $\frac{1}{2}\cdot\frac{1202}{(401)^{\frac{3}{2}}}$

2,8284
5,6568

22,6274
128
1810198
452548
22627 4
2896,3072

187 | 329 | 17
187
1480
1267
1248

2,0042221
1,0021100
2,4800007
2,0066480
0,473527 − 1

2,6023144
1,1201572
3,0799407
3904716
0,175188 − 1

0,29753
0,14969

0,14867
0,07485
0,07382
0,85133

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Z 4° 17' 20"

0,998782 -1
0,196121
0,194903
1,56640
19272
+ 1,37268

0,873817 -2
0,413350
0,287167 -1
0,193717
2,122544
1,028030
0,873817 -2
2,024391
0,137576
2,161967

145,200

+ 1,54580

163,961

2,122544
1,505286
0,397758 -2
2,025588

2,025588
0,189153
2,214741

X

0,873817 -2
0,196121
0,069938 -1
0,117473

0,998782 -1
0,413350
0,412132
2,58305
11747
+ 2,70052
0,431444
2,024391
2,455835

285,650

+ 3,689217

391,282

2,025558
0,566422
2,592490

0,998782 -1
0,397766 -2
0,396548 -2
0,024200

2,122544
1,329058
0,873817 -2
2,325419
0,173520 -3
0,105939

0,873817 -2
0,608291 -1
0,482108 -2
0,00305465
249200
- 0,00552665
+ 0,00054265

0,1148

0,873817 -2
0,397766 -2
0,271583 -3
0,0018689

2,325419
0,609071 -1
1,934490

0,998782 -1
0,608291 -1
0,607073 -1
0,404644
1869
+ 0,406513

85,994

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175° 42' 40

2.

~~0,998782~~
0,998782 -1
0,397766 -2
0,396548 -2

0,0249200
214905
+ ~~0,0103705~~
- 0,0034295

2,122544
1,204256
0,998615 -2
2,325415
0,535231 -3
0,860646 -1

0,873817 -2
0,458426 -1
0,332243 -2

0,0214905

5° 42' 15"

= 0,725515

4° 17' 20

0,998782 -1

0,0249200

0,873817 -2
0,608291 -1
0,482108 -2

0,0303465
249200
- 0,0054265

2,122544
1,204256
0,697599 -2
2,024399
0,734520 -2
0,758919 -1

0,574070

X.

0,873817 -2
0,397766 -2
0,271583 -3

0,0018689

0,998782 -1
0,458426 -1
0,457208 -1

0,288555
1869

+ 0,288424

2,225415
0,460025 -1
1,785440

61,0155.

~~0,998782 -1~~
0,873817 -2
0,0018689

~~0~~
0,998782 -1
0,608291 -1
0,607073 -1
0,404643
1869
0,406512

0,609071 -1
2,024399
1,633470

43,0002

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φ	sin φ	cos φ
0	+ 0	+ 1,0000
22,5	+ 0,3827	+ 0,9239
45	+ 0,7071	+ 0,7071
67,5	+ 0,9239	+ 0,3827
90	1,0000	0
112,5	+ 0,9239	- 0,3827
135	+ 0,7071	- 0,7071
157,5	+ 0,3827	- 0,9239
180	0	- 1,0000
202,5	- 0,3827	- 0,9239
225	- 0,7071	- 0,7071
247,5	- 0,9239	- 0,3827
270	- 1,0000	0
292,5	- 0,9239	+ 0,3827
315	- 0,7071	+ 0,7071
337,5	- 0,3827	+ 0,9239

$$\frac{\partial z}{\partial x} = \dots \left(-0{,}9972 \operatorname{arctg} \frac{5{,}333}{z} + 0{,}0747 \log \frac{z^2+2{,}9444}{(z+0{,}4)^2} \right)$$

1) $$\frac{\partial z}{\partial x} = -342{,}831 \operatorname{arctg} \frac{5{,}333}{z} + 12{,}841 \log \frac{z^2+2{,}9444}{(z+0{,}4)^2}$$

2) $$\frac{\partial z}{\partial x} = -265{,}2 \left(\frac{\pi}{2} - \operatorname{arctg} \frac{5{,}333}{z} \right)$$

3) $$\frac{\partial z}{\partial x} = -79{,}337 \left(\operatorname{arctg} \frac{16}{z-0{,}8} + \operatorname{arctg} \frac{5{,}333}{z} \right) + 2{,}9632 \log \frac{(z-0{,}8)^2+256}{z^2+2{,}9444}$$

4) $$\frac{\partial z}{\partial x} = -79{,}56 \left(\frac{\pi}{2} - \operatorname{arctg} \frac{16}{z-0{,}8} \right)$$

5) $$\frac{\partial z}{\partial x} = +25{,}743 \left(\operatorname{arctg} \frac{16}{2{,}8-z} \right) + 3{,}9064 \log \frac{(z-2{,}8)^2+256}{(7{,}733-z)^2}$$

6 $$\frac{\partial z}{\partial x} = +26{,}52 \left(\frac{\pi}{2} - \operatorname{arctg} \frac{16}{2{,}8-z} \right)$$

7 $$\frac{\partial z}{\partial x} = -371{,}26 \frac{\pi}{2}$$

$$= \dots + 1{,}171 \operatorname{arctg} \frac{5{,}333}{z} + 0{,}22 \operatorname{arctg} \frac{16}{z-0{,}8} + 1{,}18 \operatorname{arctg} \frac{16}{z-2{,}8} + 9{,}878 \log (z^2+2{,}9444) - 12{,}841 \log (z+0{,}4)^2 - 0{,}5432 \log [(z-0{,}8)^2+256] + 3{,}9064 \log (7{,}733-z)^2$$

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

265,2
79,56
26,52
371,26

742,54

342,83
344,54
1,71

742,54.
$2\pi/\delta =$

662
1226

28
11,2

742,56 ≈

$$\sum = -742{,}54\,\frac{\pi}{2} + 1{,}71\,\operatorname{arctg}\frac{5{,}333}{z} + 0{,}22\,\operatorname{arctg}\frac{16}{z-0{,}8} + 1{,}18\,\operatorname{arctg}\frac{16}{2{,}8-z}$$

$$\left.\begin{aligned} &+ 9{,}878\,\log\,(z^2+2{,}944) \\ &- 12{,}841\,\log\,(z+0{,}4)^2 \\ &+ 6{,}870\,\log\,[(z-0{,}8)^2+256] \\ &- 3{,}906\,\log\,[7{,}733-z]^2 \end{aligned}\right\}$$

$$\left.\begin{aligned} &+22{,}745\,\log(\text{Ar})(z^2+2{,}944) \\ &-59{,}135\,\log(\text{Ar})(z+0{,}4) \\ &+15{,}849\,\log(\text{Ar})[(z-0{,}8)^2+25{,}6] \\ &-17{,}988\,\log(\text{Ar})(7{,}733-z) \end{aligned}\right.$$

$+1{,}71\cdot 90^\circ$
$+0{,}22\cdot(87^\circ 8' 15'')$
$+1{,}18\,(80^\circ 4' 25''$

2,686
1,649
4,335
0,335

1,57080
1,52084
1,09955

$z=0$

1,57844
233
1
1,52084

1,39626
117
12
1,09755

arc 9 | + 4,000

$+22{,}745\cdot 0{,}468938$
$+59{,}135\cdot 0{,}397940$
$+15{,}849\cdot 2{,}409024$
$-17{,}988\cdot 0{,}888348$

60,403

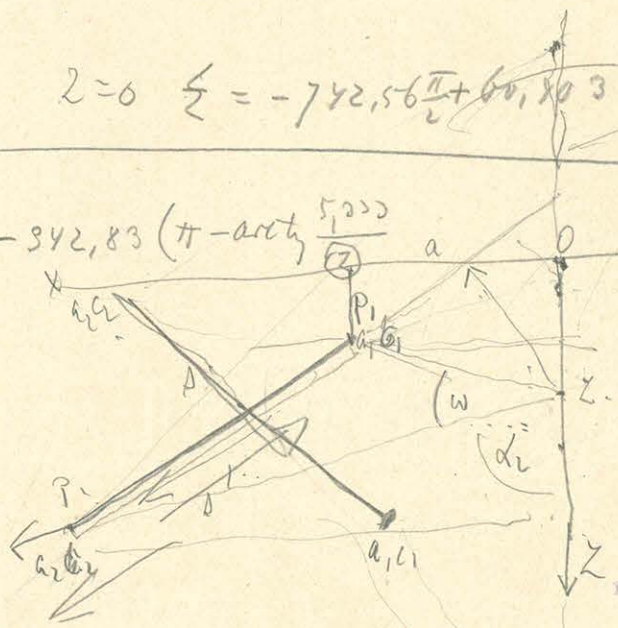
+ 10,666
+ 23,502
+ 38,184
72,383
15,980
56,403

60,403

$z=0 \quad \zeta = -742{,}56\,\frac{\pi}{2} + 60{,}403$

$\varphi = (P_1 \to P_2, X)$

$-342{,}83\left(\pi - \operatorname{arctg}\frac{5{,}333}{z}\right)$



$$+2\,f(\sigma')\left(\operatorname{arctg}\frac{a_2}{a_2-z} - \operatorname{arctg}\frac{a_1}{a_1-z}\right)\cos\varphi$$

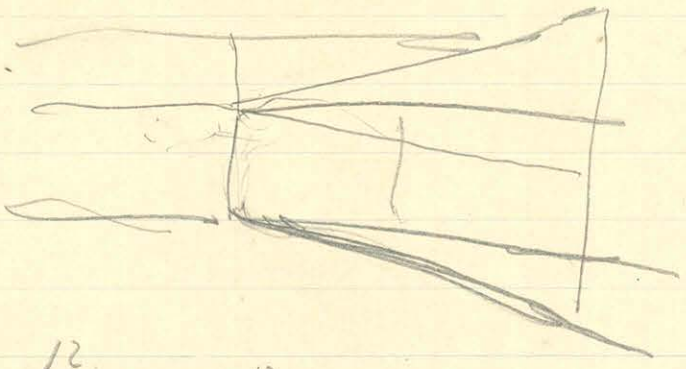
$$+2\,f(\sigma')\left(\operatorname{arctg}\frac{a_2}{a_2-z} - \operatorname{arctg}\frac{a_1}{a_1-z}\right)\cos\varphi$$

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

$\frac{16,0,8,2,}{33,52} = 25,6.$

$10,7 \cdot 0,8 \cdot \blacksquare + 2,6 \cdot 0,6 \cdot 16$

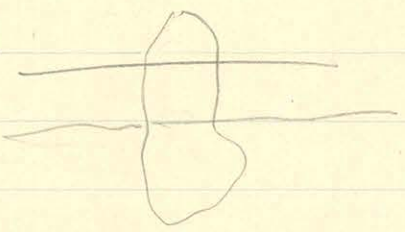
$8,56 + 24,96.$ **7,92**

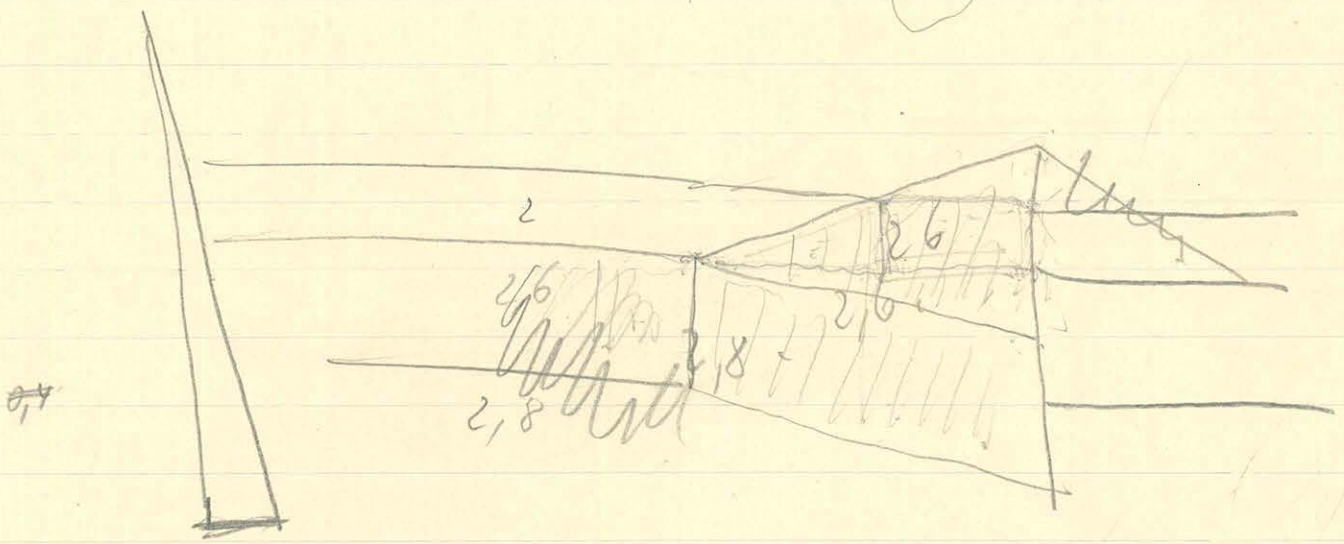


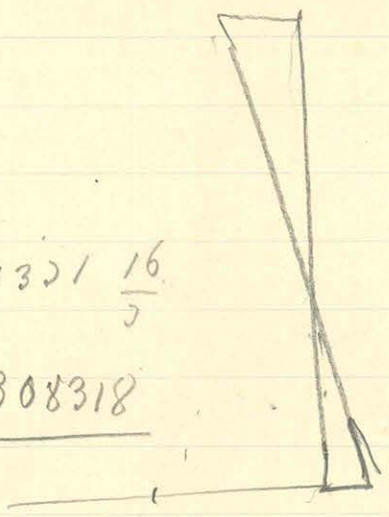
$2,8 \cdot 16 \cdot \frac{x}{2} = 7,92.$

$x = \frac{7,92}{22,4} = 0,35357$

$\frac{12}{160}$ $x : \frac{12}{160} = 4$ $x = 5,2333.$







$\frac{16 \cdot 1,2}{2} 2,6 + 16 \frac{7,92}{22,4} 1,3 = \frac{16,1,2}{2} \cdot 2 - \frac{5,3 \cdot 0,4}{2} 2$

$+ 16 \frac{7,92}{22,4} 1,4.$

$16 \cdot 1,2 \cdot 0,3 - 1,6 \frac{7,92}{22,4} = - 5,3 \cdot 0,4.$

$16 / 4,9331 \frac{16}{5}$

$\varphi = 0,308318$

$5,76 + \frac{6,4}{5} = 1,6 x$

$x = 4,9331.$

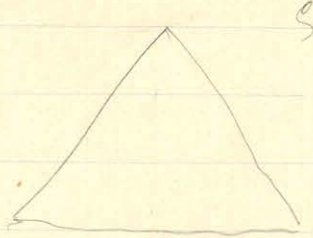
$\frac{12}{160} \cdot \frac{4}{5}$

$5,76$
$2,133$
$16 / 7,893$

491.

$\frac{\frac{3}{2}\cdot\frac{1}{2}\cdot\frac{1}{4}}{1\cdot2\cdot3} = \frac{3}{48}$

$\rho = \frac{a}{1+e\cos\varphi}$



$\frac{0.2\times0.2}{0.04\times0}$

$x = \rho\cos\varphi$

$y = \rho\sin\varphi$

$\frac{dy}{dx} = \frac{dy}{d\rho}\frac{d\rho}{dx} + \frac{dy}{d\varphi}\frac{d\varphi}{dx}$

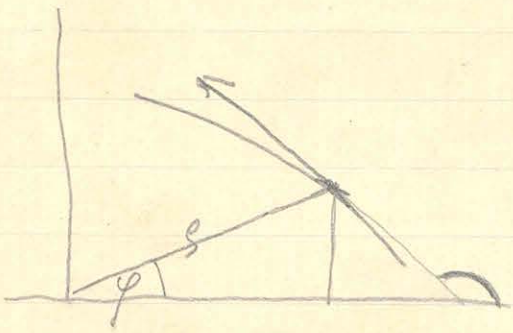
$1 = \frac{\partial\rho}{\partial x}\cos\varphi - \rho\sin\varphi\frac{\partial\varphi}{\partial x}$

$1 = \frac{\partial\rho}{\partial y}\sin\varphi - \rho\cos\varphi\frac{\partial\varphi}{\partial y}$

$\frac{\partial x}{\partial\rho} = \cos\varphi \qquad \frac{\partial x}{\partial\varphi} = -\rho\sin\varphi$

$\frac{\partial y}{\partial\rho} = \sin\varphi \qquad \frac{\partial y}{\partial\varphi} = \rho\cos\varphi$

$\frac{dy}{dx} = \frac{\sin\varphi}{\cos\varphi} + \frac{\rho\cos\varphi}{\sin\varphi} = \operatorname{tg}\varphi - \operatorname{ctg}\varphi = \operatorname{tg}\varphi + \frac{1}{\operatorname{tg}\varphi} = \frac{\operatorname{tg}^2\varphi - 1}{\operatorname{tg}\varphi}$



$\frac{\partial F}{\partial x} + \frac{\partial F}{\partial y}\frac{dy}{dx} = 0$

160 — 500 — 90.
65 — 60

15 kuhn.

340 / 6500 | ~~400~~ 400 / 6000.

1 / ~~0,0320~~ 0,05.

0,07

6,5

50

77

400.

300

20 1/20 1,2. 66. lug 20.

3,6. 66.

24.

300 / 4000.

300 / 13500.

~~27 kühe~~

400 / 2800.

900 / 2700.

400

293

300

3,6 / 26. 77 | 5200 / 462 / 280 | 6,5

25 1/20 0,6.

1/1 6.

$2,\frac{3}{10}66.5$

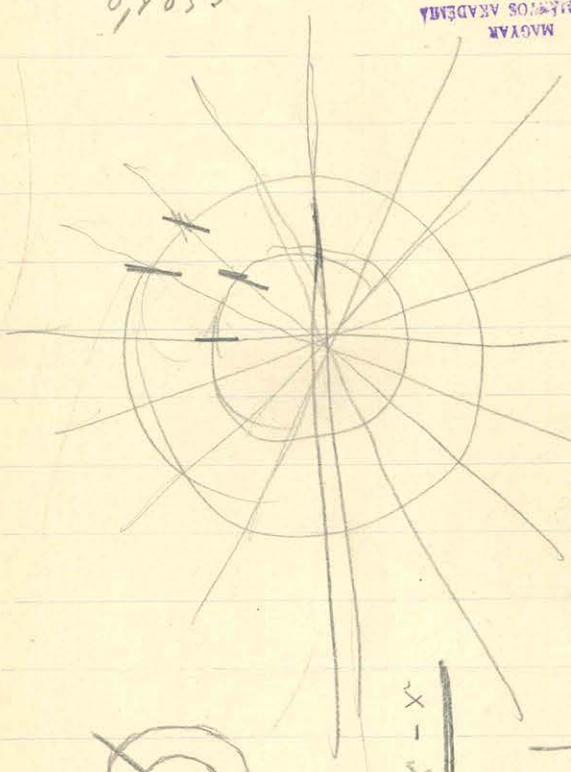
10.5

$0,6 \cdot 10 \log \frac{10,67}{0,8} + 2,6 \cdot 10 \log 1,5$

$15,56 + 10,$

$4,6728$
$2,0794$
$2,5934$
15.5604

$2,7087$
3026
$0,4055$



MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

$4,1 \quad 0,5$

$a^2 + 46^2$

$a\left(1 + 2\frac{h^2}{a^2}\right)$

$0,2.10.\log \frac{180}{28}$ 0

$5,1930$
$2,2222$
$1,8608$

$\frac{3,17}{62.} \quad \frac{180}{8}$

$\frac{5,2.2 \square \text{Klam.} 66}{256.}$ $\log \times \text{dx}$

$\frac{25}{1^2}$

$\frac{x^2+4^2}{\left(\frac{(x-16)^2+0,8^2}{2y+\sqrt{25}-x}\right)}$

$\frac{91-x}{8,8}$

$9,11,6$
$2,0794$
$0,6515$

$7,893 \quad 067$

$17,067 - 8,533$

$16x = 2,496 - 8,533$

$16.(1,2 + x)\,1,3 = 16.x\,1,4 + 2,0,8.5333 + 10,667.0,8$

$\log x = z$

$x = e^z$

$\frac{dx}{dz} = dz$

$dx = e^z dz$

$\int \log x \cdot dx = x \log x - x$

$\int \log x \cdot dx = x \log x - \int x \cdot \frac{1}{x} dx$

$\int \log x \cdot dx = x \log x - \int dx$

$\int \log x \cdot dx = x \log x - x$

$\int \log (x^2+z^2) \cdot x^2 \cdot dx$

$\int \log (1+c^2) dx + \int \log x^2 dx$

$2 \log (1+c^2)$

$\int \log x = x \log x - x + 1 + 1$

$\int \log x \log x = x \log x - \int x \log x \cdot \frac{1}{x} dx$

$x = x$

$\int \frac{2\,dx\,dz}{(x^2+z^2)} \cdot z$

2 f. 6 . 16.02 tin 87° 8' ((2° 52') $\log \frac{16{,}02}{16}$.

2/5 2,8 tin 80° 4'

1,39626
,16
1,39642

0,145076
0,447158
2,122544
2,714778

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$b = \infty$ $a = 0{,}8$ $c = 16$.

$$Z = 2fs\left(0{,}8 \operatorname{arctg} 20 + 8 \log \frac{256{,}64}{256}\right)$$

87° 8' 15"

1,216669
6,101998
1,236637

2,409324
2,408240
0,001084
0,000867

2,204120
1,447158
0,756962

2,421341
2,408240
0,013101
0,104808

$$Z = 2fs\left(2{,}8 \operatorname{arctg} \frac{160}{28} + 8 \log \frac{263{,}84}{256}\right)$$

80° 4' 29"

3,913134
0,241331
4,154465

0,096910 − 2
0,999456 − 1
1,204663
2,122544
1,423573

0,001250

1,39626
1164
128
1,397548

330,882
163,978
386 904

0,726972 0,602060 −1	0,726972 0,301030 −1	0,726972	0,726972 0,501050 −1	0,726972 0,602060 −1	0,726972 0,778751 −1
1,124912 −[85° 42′ 39″ + 94° 17′ 21″	1,425942 −[87° 57′ 8″ + 92° 8′ 52″	∞ 90°	1,425942 + 87° 57′ 8″	1,124912 + 85° 42′ 39″	0,948821

0,8

0,726972 0,903090 −1	0,726972 0,000000	0,726972 0,079181	0,726972 0,146128	0,726972 0,204120	0,726972 0,255273
0,823882	0,726972	0,647791	0,580844	0,522852	0,471699

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

4°18
85°43

2/5. 40000. (171°26')

5,2
208000. 66,3 . 2,9921

206
190

0,0076. 16.

1,5708
1,4218
2,9921

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KÖNYVTÁRA

0,728216 1,025042	1,329052 1,329357	1,028042 1,329257	1,329257 1,332762.	1,332762 0,972851	0,972851 1,042497	1,042497 1,029262	1,029262 1,028042 455,75
−0,299826	−0,000305	−0,301315	−0,003705	+0,959911	−0,069646	+0,013235	+0,001220
−0,69038	−0,0007023	−0,69387	−0,007840	+0,82873	−0,16037	+0,030475	+0,002809
							4,658727 1,329368
175° 42' 40" 4° 17' 20"	$w_1 - \varphi_1 = 90°$	4° 17' 40"	90°	17° 8' 10"	− 17° 8' 10"	− 90°	− 90°
0,873817 − 2 0,839101 − 1 0,712918 − 2		0,873817 − 2 0,841234 − 1 0,715051 − 2		0,469296 − 1 0,918392 − 1 0387693 − 1	0,469296 − 1 0,205204 − 1 0674500 − 2		
0,998782 − 1 0,874250 − 2 0,873032 − 2		0,998782 − 1 0,572800 − 2 0,572582 − 2		0,980280 − 1 0,922440 − 1 0,902720 − 1 − 024417 + 079932	0,980280 − 1 0,282826n 0,263106 − 0,047607 + 1,83276		
+ 0,051632 − 0,074650		+ 0,057886 − 0,037375					
( ) − 0,023018 8° 34' 40" $\varphi_1 \sin w_1$ = + 0,79771	+ 0,0007023 90° + 21,3333	+ 0,014511 4° 17' 20" + 0,79771	+ 0,007840 87° 51' 10" + 21,33331	+ 0,55515 24° 36' 50" + 8,96152	+ 1,78550 38° 16' + 5,8179	+ 0,03048 75° 17' 30" + 10,66681	+ 0,002809 85° 42' 40" + 10,66675
− 0,018362	+ 0,014982	+ 0,011546	+ 0,16725	+ 4,97499	+ 10,38786	+ 0,32512	+ 0,029963
− 2,13480	+ 1,98661	+ 1,53498	+ 22,1771	+ 659,6837	+ 1377,4302	+ 43,11091	+ 3,97309

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVÁRA

$$\frac{0{,}07\sqrt{2}}{2} \left(\frac{\pi}{2} \cdot \cos 9°17' + 0{,}07\sqrt{2}\,\mathrm{arg} \frac{5\sqrt{33}}{\sqrt{41}} \right)$$

$$\frac{16{,}2\sqrt{3}}{16\sqrt{10}} \cdot \sin(80°1')\left(17^{0}4'\right) + \mathrm{lg}\,\mathrm{max}

$8{,}8 - \pi + 2{,}\dot{5}\dot{2}$

$28{,}44$
$\overline{16}$
$\overline{28{,}60}$

$5{,}35^{-}$

$28{,}\overline{4}\overline{4}\overline{4}1$
16
$\overline{28{,}60\ 41}$

$1{,}902\ 4\ 0\ 8\ 7$
$15^{-}\ 41\ 7\ 1$
$9\ 7\ 0$
$\overline{1{,}9\ 1\ 7\ 9\ 2\ 3\ 0}$

$19\ 42\ 20$
$3\ 57^{-}\ 20$
$10^{\circ}\ 47'\ 16''$

$0{,}1\ 7\ 4\ 5^{-}\ 2\ 9$
$15\ 67\ 7$
$4\ 8\ 5^{-}$
$\overline{0{,}1\ 8\ 8\ 2\ 5\ 3\ 1}$

$0{,}0\ 5\ 2\ 5^{-}\ 9\ 9$
$15^{-}\ 99\ 8\ 7\ 9$
$9\ 7\ 6$
$\overline{0{,}0\ 6\ 8\ 4\ 5\ 5^{-}\ 8}$

$10{,}\overline{6}\overline{6}\overline{6}2$

$113{,}7\ 2\ 8\ 5^{-}$
$\overline{11}$
$\overline{11{,}41\ 8\ 5^{-}}$

$2{,}0\ 5\ 8\ 5^{-}\ 0\ 2$
$\overline{1{,}0\ 2\ 9\ 2\ 5^{-}\ 1}$

$0{,}0\ 2\ 5\ 8\ 4\ 5\ 6\ 2\ 9$
$\overline{0{,}0\ 2\ 5\ 8\ 4\ 5\ 6\ 2\ 9

$21,3333^2 = 455,1097$

$20,8^2 = 432,6400$

$887,7497$; log $2,948291$

$1,474146$

$29,7952 = 9C$.

$0,023574$

$0,976426 - 3$

$0,994457 - 1$

$1,204120$

$1,322211$

$1,318063$

$9C7$ $1,318063 = \log 20,8$

$1,474146 = \log 29,7952$

$9,843917 - 10$ $44° 16' 30'' = 9C7$.

$5,3333^2 = 28,4441$

$25,7333^2 = 662,2025$

$690,6466$; log $2,839258$

$1,419629$ $26,2802 = 9D$

$K9D7$ $1,410495 = \log 25,7333$

$1,419629 = \log 26,2802$

$9,990866 - 10$ $78° 17' 25'' = K9D7$.

$20,8^2 = 432,6400$

$10,6667^2 = 113,7785$

$546,4185$ log $2,737527$

$1,368764$ $23,3757 = 9E$.

$J9E7$ $\log 20,8 = 1,318063$

$\log 23,3757 = 1,368764$

$9,949299 - 10$ $62° 51' 0'' = J9E7$

$62° 51' 0''$

$78° 17' 25''$

$141° 8' 25''$

$38° 51' 35'' = E9J7$

$1,419629$

$1,368764$

$0,050865$

$0,1171$

$9,693138$ $17° 8' 10''$

$1,204120$ $44° 16' 30''$

$0,489018 - 1$ $61° 24' 40''$

$11° 42' 35''$

$17° 8' 10''$

$28° 50' 45''$

$61° 9' 15''$

$1,474146$

$1,419629$

$0,054517$

$0,1255$

$1,474146$

$1,368764$

$0,105382$

$0,2427$.

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

$-17^\circ\ 8'\ 10^4$

0,980280 −1
0,831377 −1
0,811657 −1
+0,64872
0,0685 57 −1
0,469296 −1
0,537853 −2
+0,03450
+0,68262

− 0,469296 −1
0,831377 −1
0,300673 −1
− 0,19984
0,0685 37 −1
980280 −1
0,0488 37 −1
+0,11190
= 0,08794

$+17^\circ\ 8'\ 10''$

0,772552 −1
0,980280 −1
0,753832 −1
+0,56732
0,098644 −1
469296 −1
0,567940 −2
+0,50978
− 0,04698
+0,53034

0,772552 −1
0,469296 −1
0,242848 −1
+0,17492
0,098844 −1
980280 −1
0,078924 −1
+0,11993
+0,29485

2037,1139
1022,1700
1014,9439

0

127191

0,2422

2,122544
1,141962
0,942465 −1
3,484634
0,834179 −1
3,318813

2,122544
1,474143
0,995522 −1
3,540219
0,724554 −1
3,264773

2,122544
1,474143
0,843919 −1
3,440606
0,104453
2,154059

3,484634
0,944186 −2
2,428820

3,540219
0,469601 −1
3,009820

3,440606
0,385070 −1
2,825676

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

~~1 Dreieck~~ 2) PGB.

455,1097
0,64
455,74097 = r_2^2

$2 \log r_2 = 2,658727$

$\log r_2 = 1,329364$ 21,3483 = r_2

0,903090 −1
1,329364
0,573726 −2 = log sin φ_1 $\varphi_1 = 2°\,8'\,50''$

16
5555
19,667

0,034906
23271
2424
0,037761

~~0,903090 −1~~
1,026042
0,903090 −1

0,903090 −1
1,066959
0,836131 −2

3° 55' 20,''875 0,48 −2

21,5555

7,8400
455,1097
462,9497

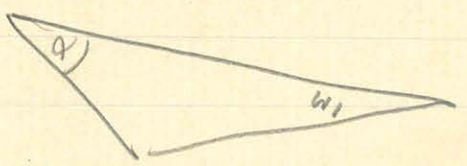
0,087266
55269
2424
0,093058

2,665554
$\log r_1$ 1,322767
0,447158
0,104391 −1

59,8039
28,4441
88,2480
1,945705
0,888348
$\log r_2$ = 0,972853
0,915495 −1

7,7555
2,8
4,9555

0,690211
1,204120
0,488991 −1



17° 8' 10"

0,820304
0,015998
1454
0,836449

82° 31' 20" = PCG.
72° 51' 50"
155° 23' 10"

7,8400
113,7785
121,6185 = PE.

$2 \log PE = 2,085005$
$\log PE = 1,042503$ 11,0282

0,447158
1,042503
0,404655 −1

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

2,740 1669
0,013 9626
2424

2,754319

2,6
10,4

380,2,6
316,06

696,32

3,1416 . 264 . 10,4 . 10000 986,96

1056
264
792
82896

9,08625
696.

17

a Kreislänge c. b = ∞

$$l = 2r_0\left(c \cdot \operatorname{arctg}\frac{a}{c} + \frac{a}{2}\ln\frac{a^2+c^2}{a^2}\right)$$

$$l = 2r_0\left(a \operatorname{arctg}\frac{c}{a} + \frac{c}{2}\ln\frac{a^2+c^2}{c^2}\right.$$

$b \ln\frac{a^2+b^2}{b^2}$. $\ln\frac{a^2+b^2}{b^2}$

$\frac{1}{b}$.

$\frac{b^2}{a^2+b^2}\left(\frac{2b}{b^2} - \frac{2b(a^2+b^2)}{b^4}\right)$ $-\frac{b^2}{a^2+b^2}\frac{1}{b^4}\left(2a^2b\right)$

$\frac{2a^2}{b(a^2+b^2}$ $\frac{2a^2b^2}{b(a^2+b^2)}$

$\frac{1}{b^2}$

15350
22,1774
659,6837
1377,4302
43,1109
2103,9372
2,4348
2101,5024 · 2.6 = 5463,9062.
8,8494
5472,7556

766,625

9,45163
0,90326
7,94618.
8,84944

654,428
2740,780.
2810,337
6235,545
5472,756
762,789

-762

654,602
1993,225
2840,337
5488,164
72756
- 15,1408

2037,1139
1022,7080
1014,4059.

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$$\frac{h_0 x_c}{h_1 c}\frac{z_c}{c} A + \frac{h_c x_c}{h_1 c}\frac{h_c}{c} B + \frac{h_0 x_c}{h_1 c}\frac{x_c}{c} X = \frac{h_c}{x_c}$$

$$\left(\frac{x_0}{h_1 c} - \frac{h_c}{h_1 c}\right)\frac{z_c}{c} A + \left(\frac{x_c}{h_1 c} - \frac{h_c}{h_1 c}\right)\frac{h_c}{c} B + \left(\frac{x_c}{h_1 c} - \frac{h_c}{h_1 c}\right)\frac{x_0}{0} X = \frac{h_c}{x_c} - \frac{h_c}{h_c}$$

$$\frac{z_c}{h_1 c}\frac{h_c}{c} A + \frac{h_c}{h_1 c}\frac{h_c}{c} B + \frac{h_c}{h_1 c}\frac{x_c}{c} X = \frac{h_c}{h_c}$$

$$\frac{z_c}{h_1 c}\frac{z_c}{c} A + \frac{x_c}{h_1 c}\frac{h_c}{c} B + \frac{x_c}{h_1 c}\frac{x_c}{c} X = \frac{x_c}{x_c}$$

Megjegyzés

$$\pi = g\sigma k + \gamma g \int \pi \, dz$$

$$\frac{\partial \pi}{\partial z} = g \frac{\partial(\sigma + \gamma\pi)}{\partial z} \qquad \frac{d\pi}{dz} = (g\sigma + \gamma\pi)\, dz$$

$$\frac{d\pi}{g\sigma + \gamma\pi} = dz$$

$$k = \int \frac{d\pi}{g\sigma + \gamma\pi} = \Big/ \frac{1}{\gamma} \ln (g\sigma + \gamma\pi)$$

$$k = \frac{1}{\gamma} \ln g\sigma + \gamma\pi - \frac{1}{\gamma} \ln g\sigma$$

$$k = \frac{1}{\gamma} \ln \frac{g\sigma + \gamma\pi}{g\sigma}$$

$$\frac{g\sigma + \gamma\pi}{g\sigma} = e^{\gamma k}.$$

Intézet gazdasági
Budapest, 19.....

Intézet gazdasági
Budapest, 19.....

$$\xi = \Big/ \frac{1}{\gamma} \ln (g\sigma + \gamma\pi) - \Big/ \frac{1}{\gamma} \ln (g\sigma +$$

igazgató

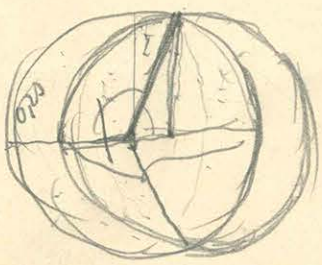
0,291

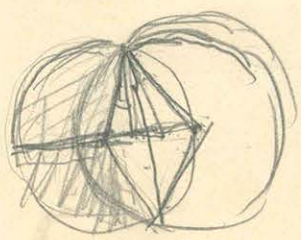
0,14 / 0,14488 / 0,143

0,77 0,25 0,146

Intézet gazdasági
Budapest, 19.....

Intézet gazdasági
Budapest, 19.....





$$0{,}02 + 2\pi\gamma\delta x = ?$$

5°
76°66'
153°33'

$\varepsilon = 13°20'$
13°33'

$\sin\varepsilon = r\,0{,}25$

$\sin\varepsilon \cdot \cos\varepsilon \, r^2$

$\sin\varepsilon = 0{,}25$

$$\frac{106{,}667}{360}\pi r^2 - \frac{53{,}333}{360}\pi r^2 + \frac{0{,}14488}{\pi}\pi r^2$$

$$\frac{106{,}667}{360} + \frac{0{,}14488}{\pi} + \frac{53{,}333}{360}$$

Rechnen mit Potenzen.

$\frac{1}{10}$ $\quad 8 \cdot 10^{9} \cdot 1000\,m$ $\quad 1000\,km$

$8 \cdot 10^{-4}$ $\quad 10\,km$

$\frac{1}{\text{Millimeter}}$

$\frac{1}{10000}$

100 km.

1 Kilogr.

$\frac{1}{200}$ $\quad \frac{1}{20}$

$1000 \cdot 100\ \frac{1}{1000\,m}$

$\frac{1}{10000} \cdot \frac{50}{\frac{1}{200}}$ $\quad 20 \cdot 25$

$\frac{1}{800}$ $\quad \frac{25 \cdot 100 \cdot 10}{1000\,m}$ $\quad \frac{25,50}{m}$ $\quad \frac{1250}{m}$

10 000 Tonnen $\quad \frac{100}{100\,m}$

$\frac{1}{m \cdot 1000}$

20 M Kilogr.

20000 M Gr.

20 Gr.

$\frac{1}{2} \cdot \frac{1}{3} \cdot \frac{1}{5} \cdot \frac{1}{8} = \frac{1}{240}$ $\quad \frac{1}{1133}$ $\quad \frac{1}{8666}$

$$\frac{h_0}{n_1 c}\frac{h_c}{c}d - \frac{h_{exc}}{n_1 c}\frac{h_e}{c}d - \frac{h_0}{h_c} + \frac{2eh_e}{n_1 c}\frac{h_c}{c}d + \frac{2exc}{n_1 c}\frac{h_c}{c}p = \frac{h_0}{2c}$$

$$\frac{h_{exc}}{n_1 c}\frac{x_0}{c}d + \frac{2x_0 x_c}{n_1 c}p - \frac{x_c}{x_c} + \frac{2eh_0}{n_1 c}\frac{x_c}{c}d + \frac{2exc}{n_1 c}\frac{x_c}{c}p = \frac{x_0}{2c}$$

$$\frac{2h_0}{n_1 c}\frac{h_e}{c}p + \frac{2eh_0}{n_1 c}\frac{h_e}{c}d + \frac{2exc}{n_1 c}\frac{h_c}{c}p = \frac{h_0}{2c}$$

$$\left(\frac{2h}{n_1 c} - \frac{2\vec{\alpha}_0}{n_1 c}\right)\frac{2exc}{n_1 c}\frac{x_c}{c}p + \frac{2eh_0}{n_1 c}\frac{x_c}{c}\frac{x_c}{c}d + \frac{2exc}{n_1 c}\frac{x_c}{c}p = \frac{x_0}{2c}$$

$$\frac{2eh_{exc}}{n_1 c}p + \frac{2h_0 x_c}{n_1 c}d + \frac{h_{e,xc}}{n_1 c}p = \frac{h_0}{x_c}$$

$$\frac{2exc\,x_c}{n_1 c}p - \frac{2eh_c}{n_1 c}\frac{h_c}{c}p +$$

$$\left(\frac{2x_0}{n_1 c} - \frac{2h_c}{n_1 c}\right)\frac{2e}{c}p + \left(\frac{2x_c}{n_1 c} - \frac{2h_c}{n_1 c}\right)\frac{h_{exc}}{c}d + \left(\frac{2x_0}{n_1 c} - \frac{2h_c}{n_1 c}\right)\frac{x_c}{c}p = \frac{h_c}{x_c}$$

$$\frac{2eh_e}{n_1 c}p + \frac{2h_0}{n_1 c}d + \frac{2h_0 x_c}{n_1 c}p = \frac{h_0}{h_c}$$

$$\frac{2e,x_c}{n_1 c}p + \frac{h_{e,xc}}{n_1 c}d + \frac{2x_c}{n_1 c}p = \frac{x_0}{x_c}$$

$$\frac{2e}{n_1 c}p + \frac{2eh_c}{n_1 c}d + \frac{2ex_0}{n_1 c}p = 2$$

$$\frac{2eh_c}{n_1 c}p + \frac{2h_c}{n_1 c}d + \frac{h_{exc}}{n_1 c}p = y$$

$$\frac{2exc}{n_1 c}p + \frac{h_{exc}}{n_1 c}d + \frac{2x_c}{n_1 c}p = x$$

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

$$x^2\left\{\left(6-9x^2\right)\cos\varphi+30x\right)^2+36\sin^2\varphi\left(x^2+1\right)^2\Big\}$$

$\varphi=0$.

$6-9x^2+30x=0$.

$x^2-\frac{10}{3}x=\frac{6}{9}=\frac{2}{3}$ $\quad x=+\frac{5}{3}\pm\sqrt{\frac{25}{9}+\frac{2}{3}}$

$x=+\frac{5}{3}\pm\frac{1}{3}\sqrt{31}$ $\quad 10,5678$

$\varphi=0$. $\quad x=3,5226$

$\varphi=\pi$ $\quad x^2+\frac{10}{3}x=\frac{2}{3}$ $\quad x=-\frac{5}{3}\pm$ $\quad 5678$

$\varphi=\pi \quad x=0,1898$.

$\varphi=\pm\frac{\pi}{2}$ $\quad 900x^2+36x^4+72x^2+36=0$.

$x^2=y$ $\quad y^2+27y=-1$ $\quad y=-\frac{27}{2}\pm\sqrt{\frac{729}{4}-1}$

$y=-27$

$\frac{972}{4}$ $\quad \frac{108}{4}$

$\left(\left(6-9x^2\right)0,7071+30x\right)^2+18\left(x^2+1\right)^2$

$\left(\frac{6}{\sqrt{2}}-\frac{9}{\sqrt{2}}x^2+30x\right)^2+18x^4+36x^2+18$

$18+40,5x^4+900x^2$
$+18+18x^4\mp\frac{54x^2}{+36x^2}\pm\frac{360}{\sqrt{2}}x-\frac{540}{\sqrt{2}}x^3$

$58,5x^4-270\sqrt{2}x^3+882x^2+180\sqrt{2}x=-36$

$x^4+6,5\,000\,5x^3+15,077x^2-4,3514x=-0,61538$

$-0,435=-0,217$

$x=0,1$ $\quad +0,007$ $\quad +0,151$ $\quad -0,870=-0,215$

$x=0,2$ $\quad +0,052$ $\quad +0,603$

$x=0,05$

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7,2 – 15,55	– 8,35	
8,4 – 24,70	– 16,30	
9,6 – 36,86	– 27,26	
10,8 – 52,49	– 41,69	
12,0 – 72,00	– 60,00	
13,2 – 95,83	– 82,63	
14,4 – 124,42	– 110,02	
15,6 – 158,18	– 142,58	
16,8 – 197,57	– 180,77	
18,0 – 243,00	– 225,00	
19,2 – 294,91	– 275,71	
20,4 – 353,74	– 333,34	
21,6 – 419,90	– 398,30	
22,8 – 493,85	– 471,05	
24,0 – 576,00	– 552,00	
25,2 – 666,79	– 641,59	
26,4 – 766,66	– 740,26	
27,6 – 876,02	– 848,42	
28,8 – 995,00	– 966,53	
30,0 – 1125,00	– 1095,00	

2,88 3,43470

3 68160.

3 64065.

3 39900.

3 04 605

1,90380

1,31775

0,90240.

0,61920.

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0,14645

$(6-9x^2)$

$\left(-(6-9x^2)0,9239 + 30x\right)^2 + 5,2725\,(x^2+1)^2$

$(-5,543 + 8,315x^2 + 30x)^2$ (11,086)

$+30,725 + 69,139x^4 + 900x^2$
$+5,273 + 5,273x^4 - 92,180x^2 - 332,580x + 49,890x^3$
$+10,545x^2$

$77,412x^4 + 49,890x^3 + 878,365x^2 - 33,2580x = -35,998$

$x^4 + 6,705x^3 + 10,998x^2 - 0,4469x = -0,4838$

$+0,44 \quad -0,8938$

$x = 0,2$

$(6 - 9\rho^2)\cos\varphi + 30\rho = 0$

$6\cos\varphi -$

$\cos\varphi - \frac{3}{2}\rho^2\cos\varphi + 5\rho = 0$

$\frac{x^2}{x^2+y^2} - \frac{3}{2}x^2 + 5x = 0$

~~Kos φ~~

$$\cos\varphi_1 - \frac{3}{2}\cos\varphi\, x^2 + 5x = 0.$$

$$x^2 - \frac{10}{3}\frac{1}{\cos\varphi} = \frac{2}{3}.$$

$$x = \frac{5}{3}\frac{1}{\cos\varphi} \pm \frac{1}{3}\sqrt{6 + \frac{25}{\cos^2\varphi}}$$

$$x = \frac{5}{3,0,92\,29} \pm \frac{1}{3}\sqrt{6 + \frac{25}{0,85\,253}}$$

$$\pm \frac{1}{3}\sqrt{35,2881}$$

$$x = 1,80395 \quad \pm 1,98017.$$

$$\frac{5}{3,0,17071} \pm \frac{1}{3}\sqrt{56}$$

$$\pm 2,49443$$

$$\frac{5}{3}\frac{1}{0,3987} \pm \frac{1}{3}\sqrt{163,2725}$$

$$\pm 4,2593$$

$$4,1803$$

$$8,4396$$

$$\frac{1}{3}\sqrt{21}$$

$$6 + \frac{25}{\cos^2\varphi}$$

$$-\frac{5}{3} \pm \frac{1}{3}\sqrt{21}.$$

1,547627.
0,773814
59405

7,48933

15896.

2,212911
1,106456.
12778

38,59

32,2985.

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$$(1+x)^{\frac{3}{2}} = 1 + \frac{3}{2}x + \frac{3}{8}x^2 - \frac{3}{48}x^3$$

$$-\cos\varphi\,\rho = 2(\rho^2+1)^{\frac{3}{2}} - 2$$

$$-\cos\varphi\cdot\rho = 2(\rho^6+3\rho^4+3\rho^2+1)^{\frac{1}{2}} - 2$$

$$-\frac{\cos\varphi}{2}\rho = \frac{3}{2}\rho^2 + \frac{3}{8}\rho^4 - \frac{1}{16}\rho^6$$

$$-\cos\varphi = 3\rho^2 + \frac{3}{4}\rho^4 - \frac{1}{8}\rho^6$$

$$0{,}923\rho = 3$$

$$0{,}308 = \rho + \frac{1}{4}\rho^2 \cdot 0{,}029$$

$$0{,}007$$

$$0{,}7071$$

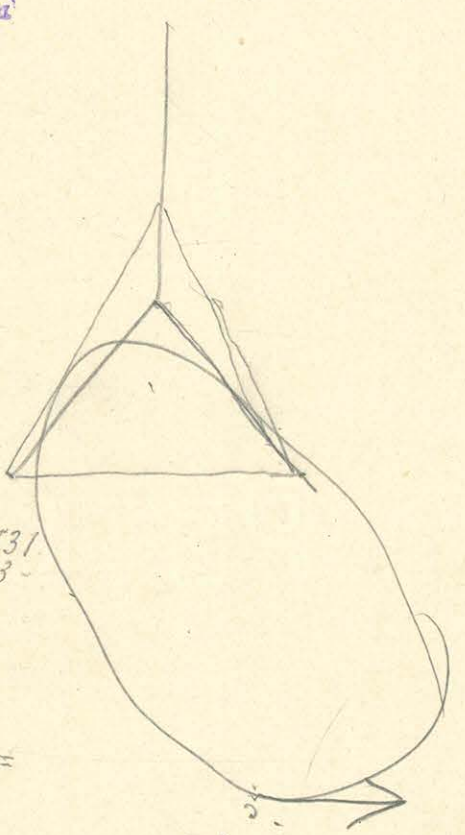
$$0{,}236 = \rho +$$

$$3827$$

$$0{,}127$$

$$\frac{1}{4}\;\frac{16}{00}$$

$$\frac{1}{24}\;\frac{256}{0{,}000}$$



$$-\rho\cos\varphi + 2 = c\rho$$

$$\rho = 2\cos\varphi$$

$$x = \rho\cos\varphi \cdot \qquad y = \rho\sin\varphi$$

$$\frac{dy}{dx} = \frac{\frac{\partial\rho}{\partial x}\sin\varphi + \rho\cos\varphi\frac{d\varphi}{dx}}{\frac{\partial\rho}{\partial x}\cos\varphi - \rho\sin\varphi\frac{d\varphi}{dx}} = \frac{\sin\varphi(x+1)}{(6-9x^2)\cos\varphi - 30x} = \operatorname{tg}\varphi$$

$$\operatorname{tg}\varphi = \frac{\frac{y}{\rho}(\rho^2+1)}{6}$$

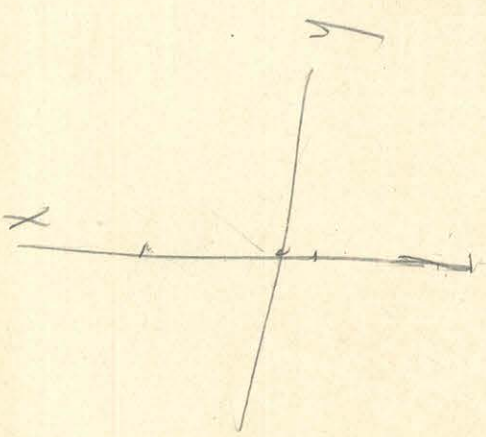
$$\frac{dy}{dx} = \frac{1}{2}(\rho+\delta)$$

$$\rho = 0{,}3333 + \delta \qquad \frac{6000}{6000}\cdot\frac{1}{4}\cdot 0{,}096$$

$$-x + 2 = c_1\left(1+2y+x^2\right)^{\frac{1}{2}}$$

$$0 = 1 + y$$

$$-2+x = c_1\left(1+2x+x^2\right)^{\frac{1}{2}}$$



$$\operatorname{tg}\varphi = \frac{y}{x}$$

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$$x = \frac{2 \pm \sqrt{6+2}}{2}$$

$$x = \frac{2}{2} \pm \sqrt{\frac{1}{4}+\frac{2}{6}}$$

$$x = \frac{2}{2} \pm \frac{\sqrt{11}}{6}$$

3,3166

0,1584

2,1584

1,99995

0,317983

0,016149

0,334132

20796

- 21 -

$$\frac{\partial \varrho}{\partial x}\cos\varphi - \varrho\sin\varphi\frac{d\varphi}{dx} = 1$$

$$\frac{dy}{dx} = \frac{\partial \varrho}{\partial x}\sin\varphi + \varrho\cos\varphi\frac{\partial\varphi}{\partial x}.$$

$$\operatorname{tg}\lambda = \varrho\frac{d\varphi}{d\varrho}.$$

$$\operatorname{tg} 2\lambda = \frac{2\operatorname{tg}\lambda}{1-\operatorname{tg}^2\lambda}$$

$$\frac{2\operatorname{tg}\psi}{1-\operatorname{tg}^2\psi} =$$

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6. $900x^2 + 36\varphi^2(x^2+1)^2 = 0$

$36\varphi^2x^4 + 900x^2 +$

$36\varphi^2x^4 + (900 + 72\varphi^2)x^2 + 36\varphi^2 = 0$

$6 \mp 9x^2 + 30x = 0$

$\mp 9x^2 + 30x + 9 = 0$

$x = \frac{\mp 30 \pm \sqrt{900 \pm 324}}{\mp 18}$

324

$\sqrt{576}$

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$\frac{\partial \rho_s}{\partial s} - \frac{\partial \rho_n}{\partial n} = 0$.

$\varphi = 0 \quad \frac{\rho}{h} = 3{,}5226.$ és $\frac{\rho}{h} = 0.$

$\varphi = \pi \quad \frac{\rho}{h} = 0{,}1893$

$\varphi = 22{,}5^\circ \quad \frac{\rho}{h} = 3{,}7841$

$\varphi = 45 \quad \frac{\rho}{h} = 4{,}8515$

" $67{,}5^\circ \quad \frac{\rho}{h} = 8{,}4096$

- 90

112,5- $\frac{\rho}{h} = 0{,}1762$

135 — $\frac{\rho}{h} = 0{,}1374$

187,5- $\frac{\rho}{h} = 0{,}0790$

180

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Egyszerű vonal $a=0$ $y=0$ $z=0$.

$Q = q\,db$.

$$\frac{1}{qk}\left(\frac{\partial X}{\partial x} - \frac{\partial Y}{\partial y}\right) = +6\alpha x\int\frac{db}{r^5} + 6\beta\left(\frac{b\,db}{r^5} + 15(\gamma x^2 c - \alpha x^3)\right)\frac{db}{r^7} + 15\beta x^2\left(\frac{b\,db}{r^7} + 15(\alpha x - \gamma c)\left(\frac{b^2 db}{r^7} - 15\beta\left(\frac{b^3 db}{r^7}\right)\right)\right)$$

$r^2 = x^2 + b^2 + c^2$

	$b=-\infty$ bis $b=+\infty$	$b=0$ bis $b=+\infty$
$\int\frac{db}{r^5} = \left(\frac{2}{3}\frac{b^3}{(x^2+c^2)^2} + \frac{b}{x^2+c^2}\right)\frac{1}{r^3}$	$\frac{4}{3}\frac{1}{(x^2+c^2)^2}$	$\frac{2}{3}\frac{1}{(x^2+c^2)^2}$
$\int\frac{b\,db}{r^5} = -\frac{1}{3}\frac{1}{r^3}$	0	$+\frac{1}{3}\frac{1}{(x^2+c^2)^3}$
$\int\frac{db}{r^7} = \left(\frac{8b^5}{15(x^2+c^2)^3} + \frac{4b^3}{3(x^2+c^2)^2} + \frac{b}{(x^2+c^2)}\right)\frac{1}{r^5}$	$+\frac{16}{15}\frac{1}{(x^2+c^2)^3}$	$+\frac{8}{15}\frac{1}{(x^2+c^2)^3}$
$\int\frac{b\,db}{r^7} = -\frac{1}{5}\frac{1}{r^5}$	0	$+\frac{1}{5}\frac{1}{(x^2+c^2)^5}$
$\int\frac{b^2 db}{r^7} = \left(\frac{2b^5}{15(x^2+c^2)^2} + \frac{b^3}{3(x^2+c^2)}\right)\frac{1}{r^5}$	$+\frac{4}{15}\frac{1}{(x^2+c^2)^2}$	$+\frac{2}{15}\frac{1}{(x^2+c^2)^2}$
$\int\frac{b^3 db}{r^7} = \left(-\frac{b^2}{3} - \frac{2(x^2+c^2)}{15}\right)\frac{1}{r^5}$	0	$+\frac{2}{15}\frac{1}{(x^2+c^2)^3}$

$$12\alpha x^3 - 4\gamma c x^2 + 12\alpha x c^2 - 4\gamma c^3 - 16\alpha x^3 + 16\gamma c x^2$$
$$-4\alpha x^3 + 4\gamma c x^2 + 12\alpha c^2 x - 4\gamma c^3$$

$$\frac{1}{qk}\left(\frac{\partial X}{\partial x} - \frac{\partial Y}{\partial y}\right) = (12\alpha x - 4\gamma c)\frac{1}{(x^2+c^2)^2} + 16(\gamma x^2 c - \alpha x^3)\frac{1}{(x^2+c^2)^3}$$

Vált alak végleges $= \frac{1}{qk}\left(\frac{\partial X}{\partial x} - \frac{\partial Y}{\partial y}\right) = 4\frac{-\alpha x^3 + \gamma c x^2 + 3\alpha c^2 x - \gamma c^3}{(x^2+c^2)^3} = 4\frac{\alpha x(3c^2 - x^2) + \gamma c(x^2 - c^2)}{(x^2+c^2)^3}$

Max min.

$$\frac{\alpha(3c^2 - 3x^2) + 2\gamma c x}{(x^2+c^2)^3} - \frac{6x\left[4\alpha x(3c^2 - x^2) + \gamma c(x^2 - c^2)\right]}{(x^2+c^2)^4}$$

Max min feltétel

$$3\alpha c^2 x^2 - 3\alpha x^4 + 2\gamma c x^3 + 3\alpha c^4 + 2\gamma c^3 x$$
$$-3\alpha c^2 x^2$$
$$-18\alpha c^2 x^2 + 6\alpha x^4 - 6\gamma c x^3 + 6\gamma c^3 x$$
$$-18\alpha c^2 x^2 + 3\alpha x^4 - 4\gamma c x^3 + 8\gamma c^3 x + 3\alpha c^4 = 0$$

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$\alpha = 1 \quad c = 1$ rc. $\gamma = 2$

$$\alpha x(2c^2 - x^2) + \gamma c(x^2 - c^2) = 3x - x^3 + 2x^2 - 2$$

2520
216

$$3x + 2x^2 - x^3 = 2$$

$x = +0,1$	$+0,3$	$+0,07x^2$	$-0,001$		$x = -0,1$
$0,2$	$+0,6$	$+0,04$	— 8		$-0,2$
$0,3$	$+0,9$	$+0,09$	— 27		$-0,3$
$0,4$	$+1,2$	$+0,16$	$-0,064$		$-0,4$
$1,875$ — $0,5$	$+1,5$	$+0,25$	$-0,125$		$-0,5$
$2,304$ — $0,6$	$+1,8$	$+0,36$	— 216		$-0,6$
$0,7$	$+2,1$	$+0,49$	— 343		$-0,7$
$0,8$	$+2,4$	$+0,64$	— 512		$-0,8$
$0,9$	$+2,7$	$+0,81$	— 729		$-0,9$
$1,0$	$+3,0$	$+1,00$	— 1000		$-1,0$ — 8
$+2$ $4,000$	$1,0$	$+3,0$	$+1,00$		$-2,0$ $+10$
$+4$ $+6,000$	$2,0$	$+6,0$	$+8,0$	— 8	
	$3,0$			$9 + 18 - 27$	

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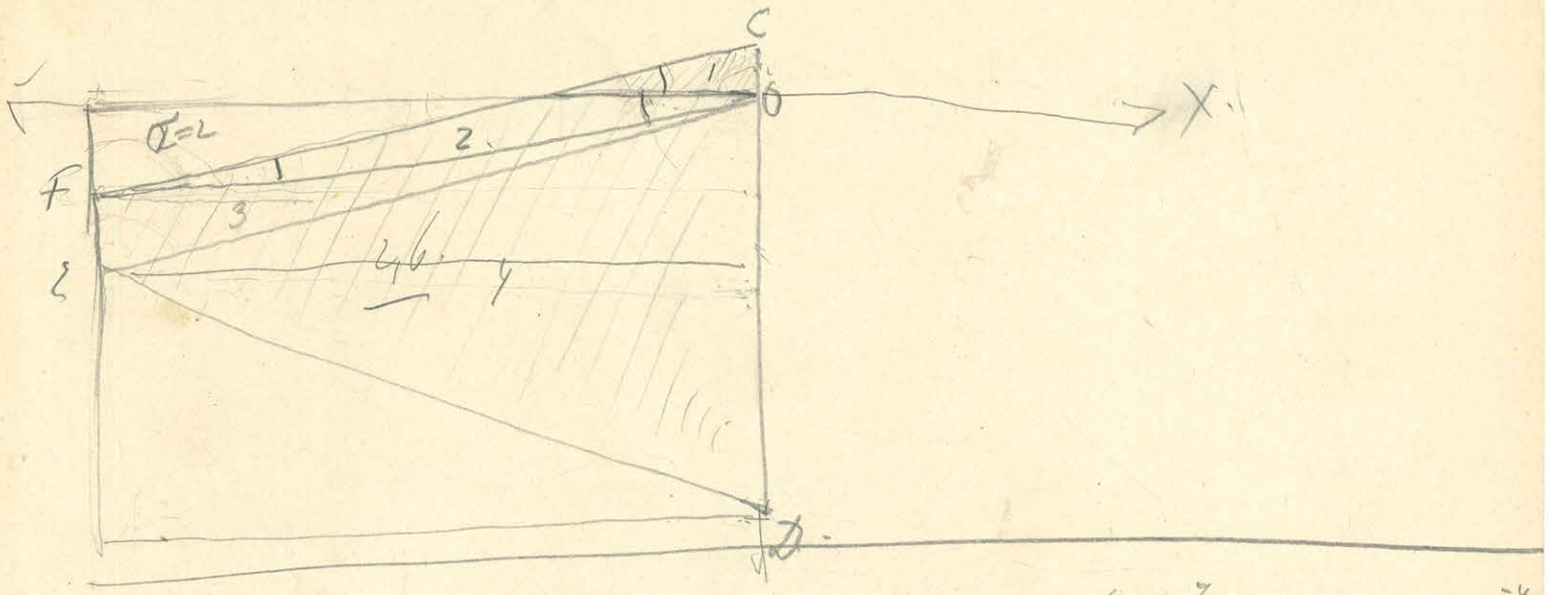
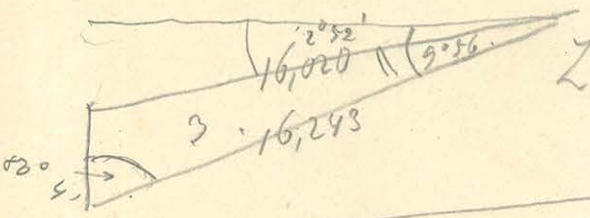
A csúcs fél Fuksgyűrűre $\Delta g = +190{,}13 \cdot 10^{-4}$

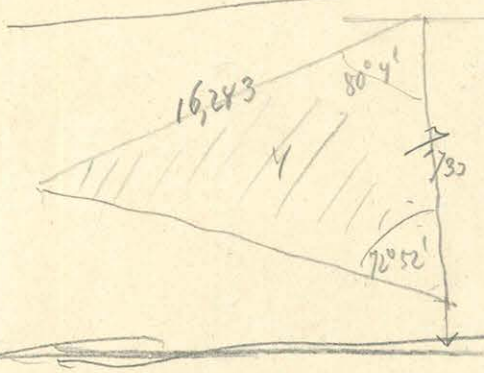


$Z = -72{,}5228 \cdot \sigma \, 10^{-4}$ $\quad \sigma = 2{,}6 \quad Z = -188{,}5593 \cdot 10^{-4}$

$Z = +1{,}6441 \, \sigma \, 10^{-4}$ $\quad \sigma = 2{,}6 \quad Z = +4{,}2747 \, 10^{-4}$



$Z = +29{,}326 \, \sigma \, 10^{-4}$ $\quad \sigma = 2{,}6 \quad Z = +76{,}248 \cdot 10^{-4}$



$Z = +1087{,}68 \, 10^{-4}$ $\quad \sigma = 2{,}6 \quad Z = +2827{,}968 \, 10^{-4}$

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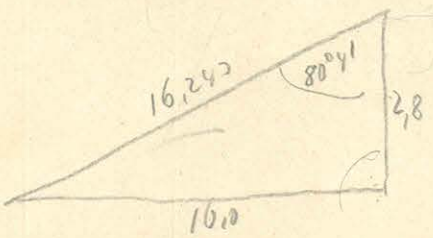
$\pm 2{,}6581$.

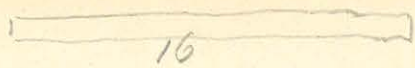
$Z = +\cancel{26{,}5281 \, \sigma \, 10^{-4}}$ $\quad \sigma =$

$\log \frac{r_1}{r_2} = 0{,}001250$

$r_1 = 16{,}0000$
$r_2 = 16{,}0200$
$\alpha = 2°52'$ $\quad \varphi_1 = 177°8'$
$w_1 = 87°8'$
$w_1 - \varphi_1 = -90°$

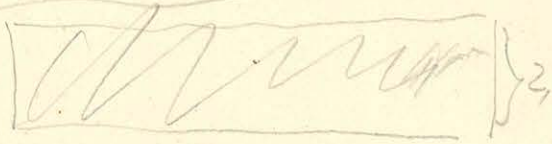


$Z = +518{,}463 \, \sigma \, 10^{-4}$



$Z = +163{,}978\ 5\ 10^{-4}$

$Z = 386{,}904\ 5\ 10^{-4}$.



Fél Franka for Tenyésztés vonyás Opuszta = $2769{,}684 \cdot 10^{-4}$.

Normális elhelyezésnél tovább = $2927{,}714 \cdot 10^{-4}$

Fél Franka Grav.
Anm $\Delta g = -158{,}030 \cdot 10^{-4}$.

egész Franka Grav. = $-316{,}060\ 10^{-4}$

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$y_1 = 0$ $\varphi_1 = 1°12'20''$ $\alpha = 90° = 1,5707963$

$t_1 = 10,6667$ $t_2 = 0,8$.

$0,9987821 - 1$ $0,8738171 - 2$

196121

329
299
48
347

$\frac{\partial^4 u}{\partial x^2}$

2558	191,1	43	74	4,4441	6818
2622	872,9	117		9,214	
2646	936,4	131		7,148	1349 / 186 = +

Arad Section 412,6 55 7,502

$\frac{\partial^4 u}{\partial x^3 \partial y}$

2558	+ 3,5	
2622	− 1,7	
2646	+ 58,9	149,4 / 186 = +

Arad Section + 90,5 55

$\left(\frac{\partial^4 u}{\partial y^4} - \frac{\partial^4 u}{\partial x^4}\right)$

2558	+ 225,5	2,8	74	457,1	6,1
2622	+ 576,6	6,1		576,6	
2646	+ 574,0		43	1247	29
				834,1 / 186	= + 4,4

Arad Section + 360,1

$\frac{\partial^4 u}{\partial x^2 \partial y^2}$

2558	− 16,0	
2633	+ 77,4	
2646	+ 81,6	+ 22,8 / 186 = +

Arad Section − 58,8

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$$\begin{array}{r} 215{,}79 \\ \hline 79{,}198 \end{array}$$

$$\begin{array}{r} \cancel{18{,}15\text{é}} \\ 4{,}318 \end{array}$$

$$\begin{array}{r} -8{,}629\text{é} \\ 18{,}15\text{é}\text{z} \\ \hline -26{,}78\text{s}\text{á} \end{array}$$

$$\begin{array}{r} 0{,}479\ 71\ \text{s}\text{á} \\ 11\ \text{zö}\text{ly}\ \text{zö} \\ \hline 0{,}2479\,3053\text{á}-1 \end{array}$$

$$\begin{array}{r} \cancel{\text{hyé}} \\ 212{,}54 \\ \hline 4{,}318 \end{array}$$

$$\begin{array}{r} \text{ép}\ 3\text{ör}\text{y} \\ 4{,}25\text{ör}-8{,}50\text{ó}\text{á} \\ \hline +51{,}798\text{á} \end{array}$$

$$\begin{array}{r} 18{,}10^{\circ} \\ \hline \end{array}$$

$r_1 = 7{,}733$ $\quad r_2 = 16{,}243$ $\quad \varphi_1 = 90$ $\quad w_1 = 72^{\circ}\ 57'\ 52''$ $\quad d = 82^{\circ}\ 4'\ 25''$

$$\begin{array}{r} 1{,}396\text{é}\text{ú}\text{s}\text{y} \\ 11\text{ö}\text{s}\text{é} \\ 12\text{i}\text{z} \\ \hline 1{,}397\text{s}\text{y}\text{á}\text{z} \end{array}$$

$$\begin{array}{r} 0{,}888\text{s}\text{ú}\text{s} \\ 1{,}2\text{i}\text{ö}\text{t}\text{é}\text{é} \\ \cancel{1769} \\ -0{,}922301 \\ \hline -0{,}7\text{y}\text{z}\text{i}\text{s}\text{o} \end{array}$$

$$\begin{array}{r} 0{,}\text{y}\text{é}\text{ö}\text{z}\text{ö}\text{ö}-1 \\ 0{,}1\text{y}\text{s}\text{3}\text{é}\text{7} \\ \hline 0{,}12\text{s}\text{é}\text{y}\text{7} \end{array}$$

$$\begin{array}{r} 0{,}\text{y}\text{é}\text{9}\text{z}\text{s}\text{é}-1 \\ 0{,}87\text{ö}\text{y}\text{ö}\text{ö}-1 \\ \hline 0{,}13977\text{é}-1 \end{array}$$

$$\begin{array}{r} 0{,}\text{y}\text{s}\text{ö}\text{z}\text{ö}\text{ö}-1 \\ 0{,}\text{y}\text{ö}\text{z}\text{s}\text{é}\text{é}-1 \\ \hline 0{,}1\text{y}\text{z}\text{s}\text{é}\text{y}\text{7} \end{array}$$

$$\begin{array}{r} 1{,}3355\text{z} \\ 0{,}2186\text{é} \\ \hline 1{,}1168\text{z} \end{array}$$

$$\begin{array}{r} 0\text{y}\text{s} \\ 0{,}0\text{y}\text{ö}\text{ö}\text{ö}\text{y} \\ 2{,}12\text{z}\text{s}\text{y}\text{y} \\ 0{,}\text{ö}\text{z}\text{8}\text{3}\text{ú}\text{s} \\ 0{,}\text{y}\text{ö}\text{z}\text{ö}\text{ö}-1 \\ \hline 3{,}03\text{9}\text{z}03 \end{array}$$

$$\begin{array}{r} 2{,}13\text{z} \\ 16\cdot \\ \hline 18\cdot \end{array}$$

$$\begin{array}{r} 2\text{ö}\text{ö} \\ 2{,}13\cdot 13\text{z} \\ \hline 16\cdot \end{array}$$

$$\begin{array}{r} 2{,}13\text{z}\ 132\cdot \\ \hline \end{array}$$

$$\begin{array}{r} 109{,}97 \\ \hline \end{array}$$

6 punto

6 d P $\varphi_1 = 90°$ $\varphi_2 = 90°$ $\alpha = 85°\,42'\,40'' = 1,4959411$.

0,602060 - 1
0,726996
1,124936

1,183 5299
012 21 73
1939
1,4959411

79,3427

0,910267
1,212640
0697627 - 1
- 0,502273

0,174903
2,122544
0,602060 - 1
1,899507

0,414189
1,424244
- 0,007055

0,980280 - 1
0,137797
0,1180077

0,469296 - 1
0,842759 - 1
0,312055 - 1

1,31244
0,20514
~~1,517758~~

137797
0,~~181157~~
2,122544
0,505150
~~4808851~~
2,765491

1,10730

95,21124

17° 8' 10"

0,181157
2,122544
0,910267
0,980280 - 1
3,194248

0,980280 - 1
0,870582 - 1
0,790862 - 1

0,469296 - 1
0,210720 - 2
0,680016 - 3

206,2910
95,12112
301,5022

30,1502
11,1680
18,9822
7,9644

920,13
18,4026

558,40
111,680
Utile 11,1680

37,1964

0,61782
00479
~~0,62261~~
0,61303

0,787482 - 1
~~0,794216 - 1~~
2,122544
1,417189
0,980280 - 1
~~3,314229~~
3,307495

0,794216 - 1
2,122544
1,326336
3,243096

870582
2,122544
1,326336
2,259462

25°

0,044265
2,122544
0,910267
0,980280 - 1
3,057356

60,3004
22,3360

280

20,8
4 g ,,

$r_1 = 25{,}7$,, $r_2 =$

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$$\ln \frac{2{,}13 + 0{,}8}{2{,}13} = 0{,}07907$$

$$\ln \frac{10{,}66 + 0{,}8}{10{,}66} = 0{,}07507$$

$$\ln \frac{2{,}13 + 2{,}8}{2{,}13} = 0{,}01707$$

$$\ln \frac{10^{44} + 2{,}8}{10^{44}} = 0{,}00663$$

$1{,}2907$	$1{,}0285$
$0{,}9075$	$0{,}9$
$1{,}2596$	$1{,}1295$
$87° 57' 10''$	$85° 42' 50''$

$1{,}0285$	$0{,}0779$
$0{,}9$	$0{,}8819$
$1{,}1295$	$0{,}9779$
$85° 42' 50''$	$82° 31' 20''$

$$173° 33' 52''$$

$$157° 48' 50''$$

$3{,}0799$	$2{,}7901$
$9{,}993$	$13{,}926$
$2{,}929$	$2{,}929$
$3{,}029$	$2{,}719$

$2{,}0$	$1{,}0$
$0{,}9$	$0{,}9$
$1{,}2$	$1{,}2$
$87° 57' 10''$	$82° 31' 20''$

$$2° 8' 50''$$

$$4° 17' 20''$$

$$7° 28' 40''$$

$$14° 42' 30''$$

$$2° 8' 30''$$

$$7° 13' 50''$$

$0{,}0397$	$0{,}0779$
$2{,}27$	$4{,}981$
$2{,}29$	$1{,}29$
$0{,}0377$	$0{,}1205$

$0{,}0779$	$0{,}1227$
$4{,}981$	$87{,}49$
$1{,}29$	$1{,}29$
$0{,}1205$	$0{,}1205$

$$y = 7{,}8y$$

$$y = 4{,}21$$

$$21{,}333^{2} = 455{,}089$$

$$10{,}666^{2} = 113{,}777$$

$455{,}089$	$455{,}089$
$113{,}777$	$113{,}777$
$11{,}378$	$11{,}378$
$1{,}89$	$1{,}89$

$$455{,}089 + 113{,}777 + 11{,}378 + 1{,}89 = 581{,}134$$

$$\sqrt{581{,}134} = 24{,}1$$

$$\frac{24{,}1}{2} = 12{,}05$$

$$\frac{24{,}1}{3} = 8{,}03$$

$$\frac{24{,}1}{4} = 6{,}025$$

$$\frac{24{,}1}{6} = 4{,}016$$

$$\frac{24{,}1}{8} = 3{,}012$$

$$\frac{24{,}1}{12} = 2{,}008$$

$$\frac{24{,}1}{24} = 1{,}004$$

$$\frac{24{,}1}{1} = 24{,}1$$

$$\frac{24{,}1}{12{,}05} = 2$$

$$\frac{24{,}1}{8{,}03} = 3$$

$$\frac{24{,}1}{6{,}025} = 4$$

$$\frac{24{,}1}{4{,}016} = 6$$

$$\frac{24{,}1}{3{,}012} = 8$$

$$\frac{24{,}1}{2{,}008} = 12$$

$$\frac{24{,}1}{1{,}004} = 24$$

$$\frac{24{,}1}{24{,}1} = 1$$

$$\frac{24{,}1}{2} = 12{,}05$$

$$\frac{24{,}1}{3} = 8{,}03$$

$$\frac{24{,}1}{4} = 6{,}025$$

$$\frac{24{,}1}{6} = 4{,}016$$

$$\frac{24{,}1}{8} = 3{,}012$$

$$\frac{24{,}1}{12} = 2{,}008$$

$$\frac{24{,}1}{24} = 1{,}004$$

$$\frac{24{,}1}{1} = 24{,}1$$

$$\frac{24{,}1}{12{,}05} = 2$$

$$\frac{24{,}1}{8{,}03} = 3$$

$$\frac{24{,}1}{6{,}025} = 4$$

$$\frac{24{,}1}{4{,}016} = 6$$

$$\frac{24{,}1}{3{,}012} = 8$$

$$\frac{24{,}1}{2{,}008} = 12$$

$$\frac{24{,}1}{1{,}004} = 24$$

$$\frac{24{,}1}{24{,}1} = 1$$

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2,42341
0,01508
0,02999
2,46768
2,46833

7,41224
0,18220
0,35538
7,94982

7,99487
0,55283
8,54770
79846
7,74924

0,79949
55283
1,35232
79846
0,55386

2,78425
1,87142
4,65567
2,73824
1,91743

1216.

2037,1139
1022,7080
1014,4059

1,52498

-2,43480

0,45163
3,97209
4,42472
8,84944

2103,9454
2,4348
2101,5106

5463,9276
8,8494
5472,7770

654,428
2740,780
2840,337
6235,545
5472,777
762,768

28
28
224
56
784
20
3
83 4

10,4175
7,758
3
818

2,42341
0,01501
0,02991
2,46833

7,41224
0,18220
0,35538
8,24982

0,79949
55283
1,35232
79846
0,55386

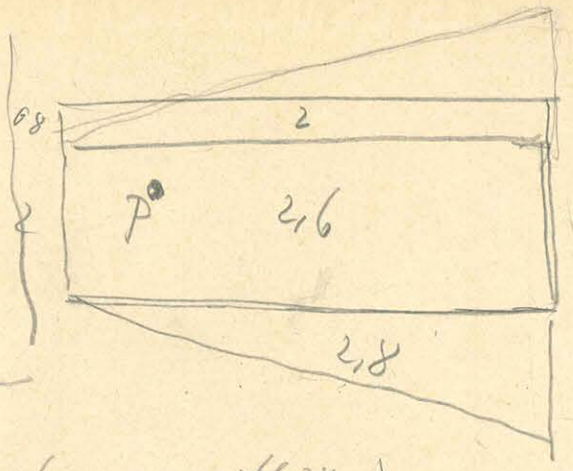
2,78425
1,87142
4,65567
2,73824
1,91743

1,86579
2,02539
1,85355
2,42026
3,09128
2,14366
2,42530
3,02483
2,39475

1,09

1381,260
1014,406
2395,766

3059,97
5,26
3065,23



$$P^\circ = 2/6\left(3{,}2\,\operatorname{arctg}\frac{16}{3{,}2} - 1{,}2\,\operatorname{arctg}\frac{16}{1{,}2} + 8\cdot\lg\frac{266{,}24}{257{,}44}\right)$$

$-1{,}7951293 \qquad +0{,}279941$

$\frac{6}{40} 0{,}6 \quad \frac{1}{10}$

7 log.

2,42,5273
41067 6

0,015197
0,121576

1,2617568
119264
1164

1,2733996

0,279941
41394879

4,674820
1,795129

2,879691

0,698970

78941'24

38785

$P_0 = 6 \cdot 387{,}85$

1176,91
619,90
= 557,015.

238,05
387,85
61990

2.161,33 = 322,66
2,6.387,85 = 992,81
2,8.557,07 = 1559,63

2875,10

Ismét Franka Gyula cím. munkája

3065,23
2875,10

190,13.10^{-4}.

ált. Trí
spec. Trí

$\Delta g = \pm 0{,}0790$ $\Delta g = +0{,}0380$

9,700

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6,2,6.

16.

1,3733

0,1222
6

0,016809

+ 16,045 . 0,9972 (. log 16,217 / 16,045 = 1,31246 / 0,205233

+ 16,217 . 0,4764 (1,3733 . 0,9557 − 0,2946 log 16,217 / 8,13)

1,10723

0,268985 / 8,60670 / 8,87565

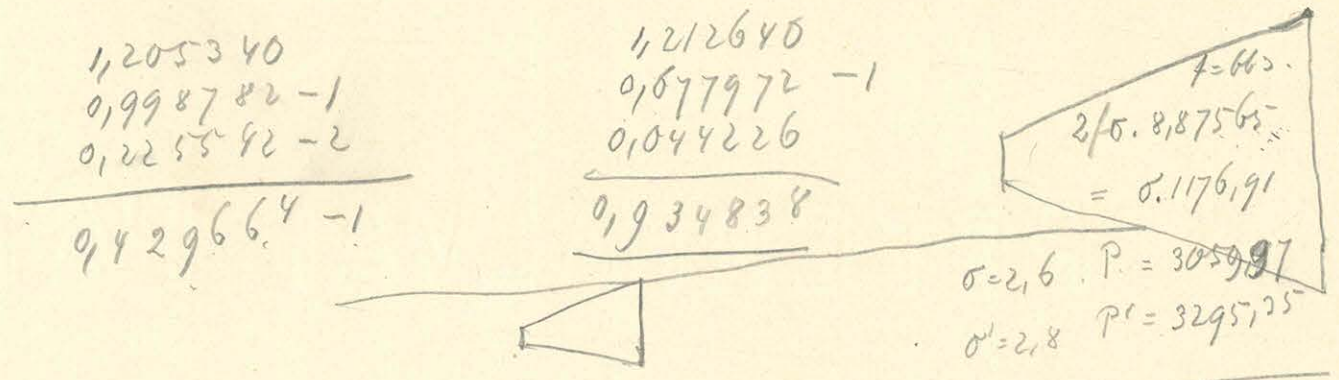
1,212640 / 1,205340 / 0,007300

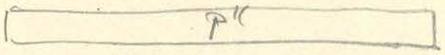
1,212640 / 0,910091 / 0,302549

588,4556 / 1176,9112

1,205340 / 0,998782 −1 / 0,225542 −2 / 0,429664 −1

1,212640 / 0,677972 −1 / 0,044226 / 0,934838





$\delta_1 \neq \infty$ $\quad C = 16.$

$a' = 1,2 \quad a = 0,4.$

$P'' = 2 \cdot 5 \left(1,2 \operatorname{arctg} 13,0000 - 0,4 \operatorname{arctg} 40 \right.$

8 log 257,44/256 − 8 log 256,16/256. 8 log 257,44/256,16.

4,410676 / 2,408511 / 9002165 / 0,017320

−0,039881 0

8542' 50"

1,124928

1,4835295 / 0,0221773 / 0,0001939 / 1,4959411 / 29918822 / 1,7951233 / 0,1837972 / 1,1768096 / 39881 0 / 1,2166906 / 2,4333812

1,602060 / 88° 34' 4" / 1,5358897 / 9802 / 194 / 1,5457993

2,63

10,24.

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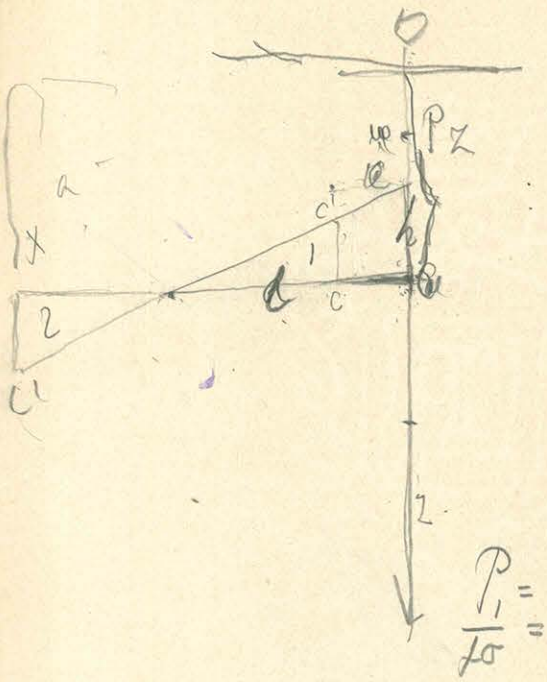
169,33016. $T^0 = 5\,161,33$

P''' P''' $P''' = 5158,70$

6b)
1326

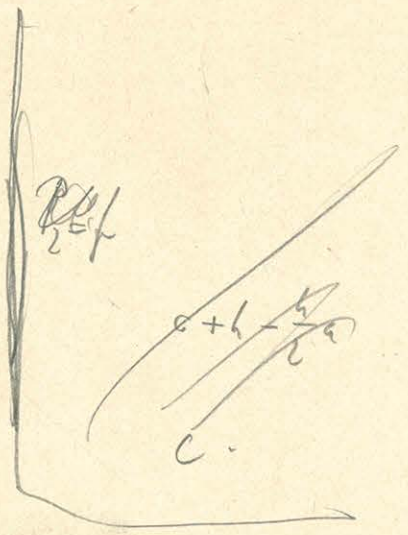
$P'''' = 79,355$



$$P_1 = \int\int \sigma \frac{da\,dc\,(c-z)}{(c-z)^2+a^2}$$

$$P_1 = \int \sigma\, da \Big| \log\left((c-z)^2+a^2\right)$$

$$c-h+\frac{h}{c}a$$



$$\frac{P_1}{f\sigma} = \log\left((c-z)^2+a^2\right)da - \log\left((c-h+\frac{h}{c}a-z)^2+a^2\right)da$$

$$= \log\left((c-z)^2+a^2\right)da - \log\left((c-h-z)^2+2(c-h-z)\frac{h}{c}a+\left(1+\frac{h^2}{c^2}\right)a^2\right)da$$

$$(c-z)^2+a^2 = y \qquad 2a\,da = dy \qquad da = \frac{dy}{2a}.$$

$$= \frac{\log y\, dy}{2\sqrt{y-(c-z)^2}} \qquad \log(c-z)^2+a^2 = y.$$

$$\frac{2a\,da}{(c-z)^2+a^2} = dy$$

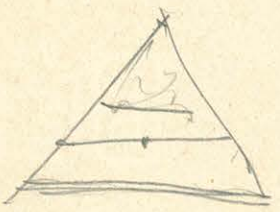
$c \cdot c-z$ helyett.

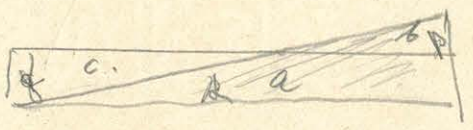
$\int \log(c^2+a^2)\,da$ $\qquad \int P\,dx = Q$ $\qquad \int \frac{2a^2\,da}{c^2+a^2} = R$

$P = 1$ $\qquad \int T\,dx = X$

$Q = a$

MAGYAR
TUDOMÁNYOS AKADÉMIA
KÖNYVTÁRA





$(a+c)\beta$ $\qquad (a+c)\gamma$

$(a+b)\alpha$ $\qquad (c+a)\gamma - a\gamma + (a+b)\alpha$

$b\alpha$

$a(\alpha-\gamma)$

16/28 0,175
120
112
80

2,8 16/0,2/ 0,2
16/0,8/ 0,05

9° 56
2° 52

152° 52'
27° 8'

180° - 80° 4' - 72° 52'

17° 8'

180° - 78° 41' - 72° 52'

157° 33'
28° 27'

$\varphi_1 = 4° 17'$

$\varphi_2 = 11° 19'$

$w_1 = 94° 17'$

$w_{01} = 7° 21'$

$r_1 = 16,045$

$r_2 = 16,317$

$r_3 = 8,13$

$w_2 = 28° 27'$

$w_{02} = 78° 41'$

17° 8
72° 52'
180

4,93
28
43
77

2,8
8,13

$\infty \cdot 0$

$\ln \frac{\sqrt{a^2+b^2}}{b}$

$\frac{1}{b}$

256
10,24

$\frac{0}{0}$

$\frac{b}{\sqrt{a^2+b^2}} \left(\frac{b}{\sqrt{a^2+b^2} \cdot b} - \frac{\sqrt{a^2+b^2}}{b^2} \right)$

$\frac{-a^2}{\sqrt{a^2+b^2}\, b^2} \cdot \frac{b}{\sqrt{a^2+b^2}}$

$-\frac{1}{b^2}$

$a^2 \cdot \frac{b}{a^2+b^2}$

$-\frac{a^2 b}{(a^2+b^2)}$

1,44

$r_1^2 = 257,44$

$r_2^2 = 266,24$

$r_3^2 = 6,61$

2,410676
− 1,205338
2,425273
1,212637

$20 \pi (90° - 4° 17')$

85° 43'

66
1026

198,3747
79,34988

1,4835299
1250812
1,4960381

MAGYAR
TUDOMÁNYOS AKADÉMIA
KÖNYVTÁRA

1912. május 28 dc Kohlrausch II.

Iroda szoba. Erdélyi utca felőli oldalon, a saroktól a második ablaknál; az ablakközépétől számítva 1 méterre. Erkélymagasság 130 cm. Könyökmagasság 123

129 +6 — 90 −39 — 146 +23 — 139 +16 — 156 +33 — 137 +14 — 213 +90 — 116 −7 — 186 +63 — 159 +36 — 193 +70 — 218 +95 — 62 −61 — 223 +160 — 178 +53 — 191 +68 — 183 +60 — 167 +43 — 124 +1 — 148 +25 — 81 −42 — 107 −16 — 85 −38 — 136 +13 — 166 +43 — 3783 (15)

70 — 168 — 10h. 17m − 18m.

161

180

156 +33 — 129 +6 — 141 +18 — 67 −56 — 105 −18 — 5 −118 — 101 −22 — 92 −31 — 178 +55 — 156 +33 — 185 +62 — 105 −18 — 67 −56 — 70 −53 — 52 −71 — 165 +42 — 80 −43 — 93 −30 — 163 +30 — 85 −38 — 107 −16 — 66 −57 — 126 +3 — 25 −98 — 94 −29 — 9 −114 — 59 −64 — 6414 (24)

10h. 20m − 21m.

$\sum \Delta^2 = 140699$

$\sqrt{\frac{\sum \Delta^2}{n(n-1)}} = \sqrt{53,0529}$

Könyökmagasság $= 7,29$

Nyjaratok a faltól 3 m.-re.

186
192
138
170
147
153
225
196
166
216
201
213
183
165
196
168
192
167
152
176
158
177
149
161
126
133
120
112

10 k. 29 m - 30 m

113

150
91
119
97
141
132
181
157
137
122
149
121
137
122
150
136
150
124
97
151
119
188
160
192
171
189
168
177
163

10 k. 30·5 m - 31·5 m

98

Nyjaratok a faltól 5 m.-re

122
96
105
77
85
76
96
72
107
102
120
116
135
102
109
76
98
78
62
71
81
11
105
100
98
119
116

10 k. 39-40.

124

36
118
104
113
75
110
76
85
78
45
62
49
56
30
54
37
98
80
110
81
89
67
97
81
68

10 k. 41 m - 42

88

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KÖNYVTÁRA

Pincre (az előbbi alatt) a faltól 1 m-re.

3

eszköz magassága: 138 cm.

84	107
109	112
118	94
115	97
90	66
109	89
89	77
102	87
71	79
81	91
75	86
88	89
86	99
104	90
97	100
103	87
77	76
89	86
101	77
90	88
106	84
85	94
100	86
98	96
102	84
	98
	81
	88
10 h. 53·5 – 54·5	10 h. 57 m – 58 m
47	41

MAGYAR
TUDOMÁNYOS AKADÉMIA
KÖNYVTÁRA

Ugyanott fakitűl 3 m.-re a folyóban

165
164
167
158
162
161
160
163
161
162
160
161
159
155
159
158
159
163
162
165
161
166
161
157

11 h. 19·5 m. 20·5

12 m.

163
157
164
157
156
157
155
159
158
155
156
166
160
166
158
162
156
158
155
159
155
164
162
161
163
161
166

11 h. 22 m – 23 m.

11 m

Nyaranott a faltól 3 m.-re

106
113
111
108
117
112
121
109
115
112
113
111
117
108
106
115
116
112
122
117
115
120
117
110
118

11 h. 1 m - 2 m.

15

116
125
119
125
105
124
119
124
119
125
114
117
111
121
124
120
106
112
110
113
107
109
112
104
109
106
100

10 h. 2·5 m - 3·5 m

20

Nyaranott a faltól 1 m.-re a földön.

143
139
145
141
148
137
138
137
143
148
146
143
140
149
145
154
145
146
157
145
150
142
148
145
150
153

11 h. 10 m - 11 m.

17

142
145
140
135
141
145
137
144
136
137
135
133
140
135
145
138
141
138
142
140
144
137
138
134
144
137

10 h. 12 - 13 m.

12

5

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

Torony épületben

pincre

156·8
156·9
157·2
157·8
156·8
157·2
156·7
156·6
156·3
156·0
156·5
157·0
156·0
156·5
156·1
157·0
157·3
157·0
157·1
156·9
156·3

157·0
156·7
156·3
156·1
156·9
156·2
156·1
157·0
156·3
156·8
156·0
155·9
156·8
156·1
156·0
156·8
156·9
156·3

11h. 40m - 41m.

11h. 38·5m - 39·5

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

Földszint.

201
202
205
203
205
203
205
202
200
202
201
202
201
200
203
203
204
205
204
205
202
203
202
204
202
205
203

201
203
202
206
203
204
202
204
202
204
205
203
201
201
203
203
202
205
202
202
202

11h. 44-45m.

11h. 46·5m. - 47·5m

5

5

7

I emelet.

130	132
125	135
~~120~~	130
127	133
132	128
136	132
132	134
131	131
129	133
130	129
139	136
135	
136	131
135	137
129	139
134	136
130	128
134	130
140	128
133	139
138	137
133	134
11 h. 535 - 54 5 m	11 h. 54 - 55
15	11

II emelet

152	139
144	141
151	135
148	157
152	141
138	149
147	136
138	150
144	138
140	142
145	139
135	142
142	137
139	147
134	135
138	125
145	134
147	132
148	136
146	131
145	127
148	135
145	127
140	135
138	129
141	134
133	132
138	140
140	134
11 h. 59. - 12 h. 0 m.	12 h. 1 m. 2 m.
18	24

III emelet

182
181
184
169
180
184
177
174
185
178
180
170
176
167
186
187
182
184
183
185
181
176
189
177
187
176

12h.5m.-6m.

22

174
193
192
185
172
188
177
184
173
184
175
185
179
187
184
189
182
183
180
181
183
164
175

12h.7-8

29

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

Tetőn.

111 −5
103 −13
120 +4
112 −4
122 +6
118 +2
120 +4
118 +2
119 +3
110 −6
111 −5
110 −6
107 −9
113 −3
110 −6
118 +2
100 −16
101 −15
98 −18
103 −13
101 −15
121 +5
116 0
125 +9
113 −3
119 +3
111 −5
123 +7
122 +6
125 +9
127 +10

12h.15-16

29 3537

31

116 0 Közép helyzet = 116
107 −9
124 +8
121 +5
115 −1
101 −15
112 −4
99 −17
126 +10
110 −6
115 −1
103 −13
113 −3
107 −9
120 +4
112 −4
127 +11
122 +6
113 −3
119 +3
131 +15
112 −4
130 +14
136 +20
129 +13
133 +17
117 +1
130 +14

12h.17-18

28

$\Sigma\Delta^2 = 4932$

$\sqrt{\frac{\Sigma\Delta^2}{n(n-1)}} = 1{,}3944$

3422 37

Közép hiba = 1,18

(682) 59

Uszigyetes próbában:

111·9
112·8
112·3
113·0
112·6
113·0
112·1
113·0
111·7
113·0
113·7
111·2
113·3
112·1
114·0
112·9
113·2
111·8
112·0
110·3
111·3
111·9
111·3
111·3
112·4
113·7
111·8
112·2

12 h. 27·5 – 28·5 m

3·7

112·8
112·2
113·0
112·2
113·4
113·8
112·2
111·8
113·0
111·8
112·0
111·0
112·1
112·8
112·1
113·1
111·8
112·7
112·4
112·2
114·1
113·9
114·1
112·1

12 h. 30 m – 31 m

3·1