Ms 5107/1. Eötvös L. vegyes jegyzetei

$\square$ négyzetes oszlop. $a = 1$ $b = 1$ $l = 1$ $c = 2$

$\varphi = 22\tfrac{1}{2}{}^{0}$

~~$\cos 22\tfrac{1}{2} = x$ $\sin 22\tfrac{1}{2} = \mu$~~

Forgásmomentum:

$\int_2^{1+\sin}_{1-\cos} = 0{,}045231$ $(\overline{II}-\overline{II})_1 = 0{,}721020$

$\int_2^{1+\sin}_{1+\cos} = 0{,}731453$ $(\overline{II}-\overline{II})_2 = 0{,}107399$

$\int_2^{1-\sin}_{1-\cos} = 0{,}117206$ $(\overline{II}-\overline{II})_3 = 1{,}01029$

$\int_2^{1-\sin}_{1+\cos} = 1{,}142871$ $(\overline{II}-\overline{II})_4 = 0{,}296667$

$\int_2^{1+\cos}_{1+\sin} = 0{,}434105$ $\overline{III}-\overline{III} = 0{,}0050\cancel{611}$ 565

$\int_2^{1+\cos}_{1-\sin} = 0{,}222011$ $\overline{III}-\overline{III} = 0{,}0972\cancel{08}$ 082

$\int_2^{1-\cos}_{1+\sin} = 1{,}503426$ $\overline{III}-\overline{III} = 0{,}08309\cancel{80}$ 06

$\int_2^{1-\cos}_{1-\sin} =$ 1,442374 új!! ~~1,440629~~ $\overline{III}-\overline{III} = 0{,}165512$

~~$F_{22\frac{1}{2}} = 4/\sigma l^2\, 0{,}165995$~~

0,1

$\boxed{F_{22\frac{1}{2}} = 4/\sigma l^2\, 0{,}1659966}$

Négy Correctioval december 28ikán javítva.

$\cos = 0{,}923880$

$\sin\ 0{,}382683$

$1-\cos = 0{,}076120$ $\log(1-\cos) = 0{,}881499-2$ $(1-\cos)^2 = 0{,}0057943$

$1+\cos = 1{,}923880$ $\log(1+\cos) = 0{,}284178$ $(1+\cos)^2 = 3{,}701314$

$1-\sin = 0{,}617317$ $\log(1-\sin) = 0{,}790508-1$ $(1-\sin)^2 = 0{,}381080$

$1+\sin = 1{,}382683$ $\log(1+\sin) = 0{,}140723$ $(1+\sin)^2 = 1{,}911812$

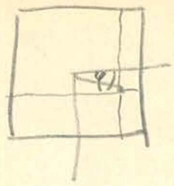
$\log\sqrt{4+(1+\cos)^2+(1+\sin)^2} = 0{,}491433$ $N = 3{,}100504$

$\log\sqrt{4+(1+\cos)^2+(1-\sin)^2} = 0{,}453771$ $N = 2{,}842957$

$\log\sqrt{4+(1-\cos)^2+(1+\sin)^2} = 0{,}386073$ $N = 2{,}432613$

$\log\sqrt{4+(1-\cos)^2+(1-\sin)^2} = 0{,}321077$ $N = 2{,}094487$

[illegible] $\varphi = 22\frac{1}{2}$



$$\frac{1}{6^2 f_0}\frac{V}{} = 2\left(U_1\right)^{1-\cos}_{\substack{1-\sin\\2}} + 2\left(U_1\right)^{1-\cos}_{\substack{1+\sin\\2}} + 2\left(U_1\right)^{1+\cos}_{\substack{1-\sin\\2}} + 2\left(U_1\right)^{1+\cos}_{\substack{1+\sin\\2}}$$

/ lásd ... és

$$\Big|^{2}_{1+\cos} 1+\sin = 0{,}405236 \quad \cancel{0{,}115386}$$
$$\Big|^{2}_{1-\cos} 1+\sin = 0{,}021630 \quad \cancel{1{,}309096}$$
$$\Big|^{2}_{1-\cos} 1-\sin = 0{,}011216 \quad \cancel{1{,}094009}$$
$$\Big|^{2}_{1+\cos} 1-\sin = 0{,}205915 \quad \cancel{0{,}056461}$$

Páros ... = − 0,0864728
1,398407
0,0446649
0,435525
1,606759
0,821734
0,0087142
0,0083474
~~10,299808~~

~~Páratlan~~ = − 14,710432
− 4,410624
2575989

Páros ... = 6,986613

Páros ... = M. 0,0389910
0,0401655
0,0769141
0,0751873
0,0853104
0,1063612
0,8826140
0,7374416
~~0,9227790~~ 0,901785
1,743419
1,603009
1,771696

M ~~8,083892~~ 8,062887

Páros ... = 18,56548
6,98661

Egyes ... = $\frac{11{,}57887}{4}$ = 2,894718

~~Páros ... = 18,61388~~
~~6,98661~~
Egyes ... $\frac{\cancel{11{,}62727}}{4}$ = ~~2,906818~~

Σ ~~...~~ ~~V_0 = 4 f₀ ... 2,854519~~ 10,052299
~~$V_{22\frac{1}{2}}$ = 4 f₀ ... 2,906818~~
V_{45} = 4 f₀ ... ~~2,937913~~ 0,031095

V_0 = 4 f₀ ... 2,854519
0,040199
$V_{22\frac{1}{2}}$ = 4 f₀ ... 2,894718
0,043195
V_{45} = 4 f₀ ... 2,937913

$\sqrt[2]{\frac{1+\sin}{1+\cos}}$

0,140722
0,284178
0,856544 -1
301030
0,555514 -1
491432
0,064082 -1
6° 36' 40"

0,1047198
104720
1999
0,1153857

$\sqrt[2]{\frac{1+\sin}{1-\cos}}$

0,140722
0,881499 -2
1,259223
301030
0,958193
386073
0,572120
75° 0' 20½"

1,3089969
994
1,3090963

$\sqrt[2]{\frac{1-\sin}{1-\cos}}$

0,790508 -1
0,881499 -2
0,909009
301030
0,607979
321078
0,286901
62° 40' 55½"

1,0821041
11635
2690
1,0940086

405 2260
216299
112162
2059149
0,6439973
2,575989

$\sqrt[2]{\frac{1-\sin}{1+\cos}}$

0,790508 -1
284178
0,506330 -1
301030
0,205300 -1
452770
0,751530 -2
3° 14' 6"

0,0523599
40724
291
0,0564614

0,1115857
1,3090963
1,0940086
0,0564614
2,5749520

0,907621
362216
1,269837

Louis Lh

0,064082 -1
0,568356
0,632438 -1
23° 13' 6"

0,4014257
37815
291
0,4052363

0,572120
0,762998 -3
0,335118 -2
1° 14' 21½"

0,0174533
40724
1042
0,0216299

0,286901
0,762998 -3
0,049899 -2
0° 38' 33½"

0,0110538
1624
0,0112162

0,751530 -2
0,568356
0,319886 -1
11° 47' 53"

0,1919862
136717
2570
0,2059149

0,655436 -2
0,281444
0,936880 -2

0,864189 -1
0,281444
0,145633

0,068950 -1
0,581016 -1
0,649966 -2

0,057997
0,581016 -1
0,639013 -1

0,637595 -1
0,568356
0,205951

0,346375 -1
0,568356
0,914731 -1

0,177229
0,762998 -3
0,940227 -3

0,158552
0,762998 -3
0,921550 -3

+ 0,696835
0,559941
0,322224
0,066490
1,645490

− 2,122566
− 0,524999
2657505
1,645490
~~1,012735~~
1,012015

707107
1,414214
~~0,585786~~
0,414214

− 0,111128
617225 −1
0,728253 −1

0,365367 −1
382775
~~0,741584~~ −1
0,748142

0,005496
150515
0,854981

716111

1291600
231935
1059665

529833
185770
0,715600

0,005187
150515
854672

715603

$8\alpha_4 + 24\alpha_{12} = 1,340008$

$\alpha_{12} = 0,000267$

$\alpha_4 = 0,166700$

$\alpha_8 = -0,005700$

$\alpha_4 + 3\alpha_{12} = 0,167501$

~~$3\alpha_4 + \alpha_{12} = 0,500364$~~

~~$2\alpha_4 \quad 2\alpha_{12}$~~ $=$

0,167501
801
0,166700

$\alpha_4 + \frac{1}{3}\alpha_{12} = 0,166788$

166700
801
167501
11400
156101

$\frac{8}{3}\alpha_{12} = 0,000713$
0,002139

$16\alpha_8 = -0,091198$

16 / 0,091198 / 0,005699
16
131
111
96
159
158

0,005700178901

α_{12}

$\alpha_4 + 2\alpha_8 + 3\alpha_{12} = 0,156101$

$-\alpha_4 + 2\alpha_8 - 3\alpha_{12} = -0,178901$

166700
267
~~166967~~

166700
267
0,166433
166788

0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
2,9
0,

0,776687

0,890246 − 1
140722
0,030968

1,260079

~~0,100743~~
0,100398
790508 − 1
0,890906 − 1

0,1022719
0,2045438

0,656116

0,876981 − 1
284178
0,101159

0,881499 − 2
0,469020
0,350519 − 1

2,944565

~~98492~~
0,248610

−2 fol $\lg \varphi$ (0,762144)

+2 fol $\lg \varphi$ 2,707505

+1,073900 −0,777868
+0,054884
+0,206616
+0,204544
1,539944
777800
0,762144

+1,262288 −0,224140
+0,623670
+0,548467
0,497220
2,931645
224140
2,707505

0,432569
582840 − 1
0,015409

0,882037 − 1
965615 − 1
~~0,847652 − 1~~

1,036117
0,704128
0,331989
0,165995

0,174979
24569
0,150410

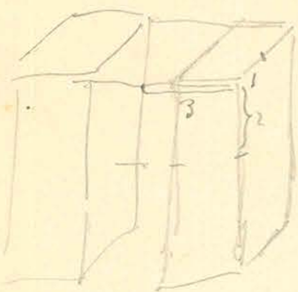
$\left\{ \frac{(x+1)^?}{(x-1)^?} \text{II} - \frac{(x+1)^?}{(x+1)^?} \text{II} \right\} \ldots + \left\{ \frac{(x-1)^?}{(x-1)^?} \text{II} - \frac{(x-1)^?}{(x+1)^?} \text{II} \right\} \ldots$

2,094490	2,094490	2,094490	2,432611	2,432611	2,432611
0,076120	0,617317	2	0,076120	1,382683	2
2,170610	2,711807	4,094490	2,508731	3,815294	4,432611
2018370	1,477173	0,094490	2,356491	1,049928	0,432611
0,336582	0,433260	0,612200	0,399454	0,581528	0,646660
0,305001	0,169430	0,975386-2	0,372265	0,021160	0,636098-1
0,031581	0,263830	1,636814	0,027189	0,560368	1,010562
0,499426-2	0,421324-1	0,213999	0,434393-2	0,748473-1	0,004562
0,790508-1	0,881499-2	0,790508-1	0,140722	0,881499-2	0,140722
0,301030	0,301030	0,881499-2	0,301030	0,301030	0,881499-2
0,590964-2	0,603853-2	0,886006-2	0,876145-2	0,931062-2	0,026783-1

2,842953	2,842953	2,842953	3,100500	3,100500	3,100500
1,923880	0,617317	2	1,923880	1,382683	2
4,766833	3,460270	4,842953	5,024380	4,483183	5,100500
0,919073	2,225636	0,842953	1,176620	1,717817	1,100500
0,678230	0,539110	0,685110	0,701082	0,651586	0,707613
0,963350-1	0,347455	0,925804-1	0,070636	0,234978	0,041590
0,714880	0,191655	0,759306	0,630446	0,416608	0,666023
0,854233-1	0,282520-1	0,880417-1	0,799648-1	0,619728-1	0,823489-1
0,790508-1	0,284178	0,790508-1	0,140722	0,284178	0,140722
0,301030	0,301030	0,284178	0,301030	0,301030	0,284178
0,945771-1	0,867728-1	0,955103-1	0,241400	0,204936	0,248389

Nagy oszlopos erőhöz vonatkozó számítások 1898 Novemberben.
arra vonatkozólag hogy miként függ a forgási momentum a rúd l jelölt.

Tegyük a régi formulában – minden a quadrat fél oldalán mint egységben



~~m. magasság = 2~~
~~szélesség =~~

szélesség $= s = 1$
hosszúság $= l = 3$
magasság $= m = 2$

$\lambda = \frac{l}{s}$

a ...

longitudinálisra: forgási momentum $= H_l \omega$.

$$\frac{H_l}{4\rho\sigma l^2} = -\left[\Big|_2^{1}{}^{3-\lambda} + \Big|_2^{1}{}^{3+\lambda}\right] + \left(1+\frac{3}{\lambda}\right)\Big|_2^{1}{}^{3+\lambda} - \left(\frac{3}{\lambda}-1\right)\Big|_2^{1}{}^{3-\lambda} + \frac{1}{\lambda}\left\{\text{II}_2^{1}{}^{3+\lambda} - \text{II}_2^{1}{}^{3-\lambda}\right\} + \frac{2}{\lambda}\left\{\text{III}_2^{1}{}^{3+\lambda} - \text{III}_2^{1}{}^{3-\lambda}\right\}$$

transzverzálisra.

$$\frac{H_t}{4\rho\sigma l^2} = -\left[\Big|_2^{3}{}^{1-\lambda} + \Big|_2^{3}{}^{1+\lambda}\right] + \left(\frac{1}{\lambda}+1\right)\Big|_2^{3}{}^{1+\lambda} - \left(\frac{1}{\lambda}-1\right)\Big|_2^{3}{}^{1-\lambda} + \frac{3}{\lambda}\left\{\text{II}_2^{3}{}^{1+\lambda} - \text{II}_2^{3}{}^{1-\lambda}\right\} + \frac{2}{\lambda}\left\{\text{III}_2^{3}{}^{1+\lambda} - \text{III}_2^{3}{}^{1-\lambda}\right\}$$

1) $\text{I}_2^{1}{}^{3-\lambda} = \operatorname{arc\,tg} \frac{2(3-\lambda)}{\sqrt{5+(3-\lambda)^2}}$

2) $\Big|_2^{1}{}^{3+\lambda} = \operatorname{arc\,tg} \frac{2(3+\lambda)}{\sqrt{5+(3+\lambda)^2}}$

3) $\Big|_2^{1}{}^{3+\lambda} = \operatorname{arc\,tg} \frac{2}{(3+\lambda)\sqrt{5+(3+\lambda)^2}}$

4) $\Big|_2^{1}{}^{3-\lambda} = \operatorname{arc\,tg} \frac{2}{(3-\lambda)\sqrt{5+(3-\lambda)^2}}$

5) $\Big|_2^{3}{}^{1-\lambda} = \operatorname{arc\,tg} \frac{2(1-\lambda)}{3\sqrt{13+(1-\lambda)^2}}$

6) $\Big|_2^{3}{}^{1+\lambda} = \operatorname{arc\,tg} \frac{2(1+\lambda)}{3\sqrt{13+(1+\lambda)^2}}$

7) $\Big|_2^{3}{}^{1+\lambda} = \operatorname{arc\,tg} \frac{6}{(1+\lambda)\sqrt{13+(1+\lambda)^2}}$

8) $\Big|_2^{3}{}^{1-\lambda} = \operatorname{arc\,tg} \frac{6}{(1-\lambda)\sqrt{13+(1-\lambda)^2}}$

9) $\left(\text{II}_2^{1}{}^{3+\lambda} - \text{II}_2^{1}{}^{3-\lambda}\right) = \log \frac{\sqrt{(3+\lambda)^2+1}}{\sqrt{(3-\lambda)^2+1}} \frac{\left(2+\sqrt{(3-\lambda)^2+5}\right)}{\left(2+\sqrt{(3+\lambda)^2+5}\right)}$

10) $\left(\text{II}_2^{3}{}^{1+\lambda} - \text{II}_2^{3}{}^{1-\lambda}\right) = \log \frac{\sqrt{(1+\lambda)^2+9}\,\left(2+\sqrt{(1-\lambda)^2+13}\right)}{\sqrt{(1-\lambda)^2+9}\,\left(2+\sqrt{(1+\lambda)^2+13}\right)}$

11) $\left(\text{III}_2^{1}{}^{3+\lambda} - \text{III}_2^{1}{}^{3-\lambda}\right) = \log \frac{\sqrt{(3+\lambda)^2+4}}{\sqrt{(3-\lambda)^2+4}} \frac{\left(1+\sqrt{(3-\lambda)^2+5}\right)}{\left(1+\sqrt{(3+\lambda)^2+5}\right)}$

12) $\left(\text{III}_2^{3}{}^{1+\lambda} - \text{III}_2^{3}{}^{1-\lambda}\right) = \log \frac{\sqrt{(1+\lambda)^2+4}}{\sqrt{(1-\lambda)^2+4}} \frac{3+\sqrt{(1-\lambda)^2+13}}{3+\sqrt{(1+\lambda)^2+13}}$

λ	H_l	H_t	$H_t - H_l$
0	−1,673752	+1,673752	3,347504
0,2	−		
0,5	−1,656543	+1,700360	3,356903
0,6			
0,8	−1,628309	+1,739551	3,367860
1	−1,600203	+1,774195	3,374398

$$\mathcal{F} = -ml^2\left(A_2 \sin 2\varphi + A_4 \sin 4\varphi + A_6 \sin 6\varphi + A_8 \sin 8\varphi + \dots\right)$$

$$\frac{\partial \mathcal{F}}{\partial \varphi} = -ml^2\left(2A_2 \cos 2\varphi + 4A_4 \cos 4\varphi + 6A_6 \cos 6\varphi + 8A_8 \cos 8\varphi + \dots\right)$$

[illegible] $\left(\frac{\partial \mathcal{F}}{\partial \varphi}\right)_0 = -ml^2\left(2A_2 + 4A_4 + 6A_6 + 8A_8 + \dots\right)$

[illegible] $\left(\frac{\partial \mathcal{F}}{\partial \varphi}\right)_{\frac{\pi}{2}} = -ml^2\left(-2A_2 + 4A_4 - 6A_6 + 8A_8 + \dots\right)$

$$\mathcal{F}_{\frac{\pi}{4}} = -ml^2\left(A_2 - A_6 + A_{10} - A_{14} + \dots\right)$$

Nagy oszlopra. $a = 3$ $b = 1$ $c = 2$ $l = 1$ re.

$a = 3$ $b = 1$ $c = 2$ $l = 1$ re

$$\left(\frac{\partial \mathcal{F}}{\partial \varphi}\right)_0 = -l^2\left(2A_2 + 4A_4 + 6A_6\right) = -4f\sigma l^2\, 1{,}600203$$

$$\left(\frac{\partial \mathcal{F}}{\partial \varphi}\right)_{90} = -l^2\left(-2A_2 + 4A_4 - 6A_6\right) = +4f\sigma l^2\, 1{,}774195$$

$$\mathcal{F}_{45} = -l^2\left(A_2 - A_6\right) = -4f\sigma l^2\, 0{,}84752$$

$\frac{A}{4f\sigma} = \alpha$

$$2\alpha_2 + 4\alpha_4 + 6\alpha_6 = 1{,}60020$$

$$2\alpha_2 - 4\alpha_4 + 6\alpha_6 = 1{,}77420$$

$$\alpha_2 - \text{—} - \alpha_6 = 0{,}84752$$

ebből

$$\alpha_2 = 0{,}84654$$

$$\alpha_4 = -0{,}02175$$

$$\alpha_6 = -0{,}00098$$

és $\mathcal{F} = -4f\sigma l^2\left(0{,}84654 \sin 2\varphi - 0{,}02175 \sin 4\varphi - 0{,}00098 \sin 6\varphi\right)$

$$\mathcal{F}_{22{,}5} = -4f\sigma l^2\, 0{,}57571$$

Csak $\left\{ \mathcal{F} = A_2 \sin 2\varphi + A_4 \sin 4\varphi \right.$ re.

$$\mathcal{F} = -4f\sigma l^2\left(0{,}843600 \sin 2\varphi - 0{,}02175 \sin 4\varphi\right)$$

hogyi néve még a $\varphi = 22\frac{1}{2}°$ al.   vagy

1) $\left(\frac{\partial F}{\partial \varphi}\right)_0 = -(2\alpha_2 + 4\alpha_4 + 6\alpha_6 + 8\alpha_8) = -1{,}600203$

2) $\left(\frac{\partial F}{\partial \varphi}\right)_{\frac{\pi}{2}} = -(-2\alpha_2 + 4\alpha_4 - 6\alpha_6 + 8\alpha_8) = +1{,}774195$

3) $F_{45} = -(\alpha_2 \quad - \alpha_6 \quad) = -0{,}84752$

4) $F_{22\frac{1}{2}} = -\left(\frac{1}{\sqrt{2}}\alpha_2 + \alpha_4 + \frac{1}{\sqrt{2}}\alpha_6\right) = -0{,}57571$

1, 2, 3 ból
$\alpha_2 = 0{,}84654$
$\alpha_6 = -0{,}000980$
$\alpha_4 = -0{,}02219$
$\alpha_8 = +0{,}00022$

$F = -4 f \sigma l^2 (0{,}84654 \sin 2\vartheta - 0{,}02219 \sin 4\vartheta + 0{,}00098 \sin 6\vartheta + 0{,}00022 \sin 8\vartheta)$

longitudinálisra $\vartheta = 0 + \varphi$ ebből

$F_l = -4 f \sigma l^2 (1{,}600204\varphi - 0{,}87519\varphi^3)$

transversálisra $\vartheta = \frac{\pi}{2} + \varphi$

$F_t = +4 f \sigma l^2 (1{,}774204\varphi - 1{,}31103\varphi^3)$

Snuntra. 1) 2) 4) mint fent hogyi néve 4) = F_{45} helyett

a potenciálegyenlet

5) $V' - V = -4 f \sigma\, 0{,}84612 = -\alpha_2 - \frac{1}{5}\alpha_6$

~~3) és 5) ből $\alpha_2 = +0{,}84647$ $\alpha_6 = -0{,}001050$~~ 5) és 1,2) ből $\alpha_2 = 0{,}84645$
$\alpha_6 = -0{,}00095$

4 ből $\alpha_4 = -0{,}02215$
$\alpha_8 = +0{,}00018$

ezekből $F_{45} = -4 f \sigma\, 0{,}84740$ helyett a régiben 0,84752.

$F = -4 f \sigma l^2 (0{,}84645 \sin 2\vartheta - 0{,}02215 \sin 4\vartheta - 0{,}00095 \sin 6\vartheta + 0{,}00018 \sin 8\vartheta)$

Újra $\varphi = 45$ φ végtelen kicsi és φ véges kicsinyből $\quad F = \alpha_2 \sin 2\varphi + \alpha_4 \sin 4\varphi + \dots$

$$F_{45} = +(\alpha_2 - \alpha_6 + \alpha_{10}) = -0{,}84752$$

Legyél ~~F~~ ~~…~~ α_4

végtelen kicsi

$$F = \alpha_2 \sin 2\varphi + \alpha_4 \sin 4\varphi + \alpha_6 \sin 6\varphi + \alpha_8 \sin 8\varphi + \alpha_{10} \sin 10\varphi = \overset{P}{-1{,}6002034\varphi} + \overset{Q}{0{,}8943504\varphi^3}$$

legyél végtelen kicsi

$$F' = -\alpha_2 \sin 2\varphi + \alpha_4 \sin 4\varphi - \alpha_6 \sin 6\varphi + \alpha_8 \sin 8\varphi - \alpha_{10} \sin 10\varphi = \overset{P'}{1{,}7741954\varphi} \overset{Q'}{-\cancel{1{,}239218}\varphi^3} \; 1{,}2037294\varphi^3$$

a két utóbbiból

$$\left.\begin{aligned} 8\alpha_4 + 16\alpha_8 &= P' - P \\ -\tfrac{2}{6}64\alpha_4 - \tfrac{2}{6}512\alpha_8 &= Q - Q' \end{aligned}\right\} \text{ezekből} \qquad \alpha_4 = \begin{cases} +\cancel{0{,}0236101} \\ +0{,}0226022 \end{cases} \quad \alpha_8 = \begin{cases} -\cancel{0{,}00093055} \\ -0{,}0004266 \end{cases}$$

és

$$4\alpha_2 + 12\alpha_6 + 20\alpha_{10} = -(P + P') = 3{,}374398 \qquad \alpha_{10} = \cancel{\pm 0{,}00020825} \; -0{,}0000438$$

$$-\tfrac{1}{3}8\alpha_2 - \tfrac{1}{3}216\alpha_6 - \tfrac{1}{3}1000\alpha_{10} = 2{,}133568 = Q + Q' \qquad \alpha_6 = \cancel{+0{,}00077175} \; +0{,}0010229$$

Most

$$\alpha_2 - \alpha_6 + \alpha_{10} = -0{,}84752 \qquad \alpha_2 = \cancel{0{,}846956} \; -0{,}846452$$

ezekkel $F_{22\frac{1}{2}} = \cancel{-0{,}57601} = -0{,}57518$

valóban $F_{22\frac{1}{2}} = -0{,}57\cancel{571}\,6324.$

~~$F = -4/\sigma l^2 (0{,}846956 \sin 2\vartheta - 0{,}0236101 \sin 4\vartheta - 0{,}00020825 \sin 6\vartheta + 0{,}00093055 \sin 8\vartheta - 0{,}00020825 \sin 10\vartheta)$~~

Újra φ véges kicsiny és Potenciálból. Ott $\frac{\pi}{2}$-ig.

$$\left.\begin{aligned} 4\alpha_2 + 12\alpha_6 + 20\alpha_{10} &= -3{,}374398 \\ -\tfrac{8}{3}\alpha_2 - \tfrac{216}{3}\alpha_6 - \tfrac{1000}{3}\alpha_{10} &= +2{,}133568 \\ -\alpha_2 - \tfrac{\alpha_6}{3} - \tfrac{1}{5}\alpha_{10} &= +0{,}846128 \end{aligned}\right\} \quad \begin{aligned} \alpha_2 &= -0{,}846326 \\ \alpha_6 &= 0{,}00046167 \\ \alpha_{10} &= 0{,}00027026 \end{aligned}$$

α_4 és α_8 értékek ugyanaz mint előbb $\qquad \alpha_4 = 0{,}0236101$ $\quad \alpha_8 = -0{,}00093055$

ezekkel

$F_{45} = -0{,}846528$ $\quad$ helyes 0,847520

$F_{22\frac{1}{2}} = -0{,}574703$ $\quad$ 0,57571

$$F = -4/\sigma l^2 (0{,}846326 \sin 2\vartheta - 0{,}0236101 \sin 4\vartheta - 0{,}00046167 \sin 6\vartheta + 0{,}00093055 \sin 8\vartheta - 0{,}00027026 \sin 10\vartheta)$$

Csak a végtelen hiány és a polarizációból. 0 és $\frac{\pi}{2}$-nél

$$F = -4\pi\sigma(0{,}84645 \sin 2\vartheta - 0{,}021750 \sin 4\vartheta - 0{,}00095 \sin 6\vartheta)$$

Diracnál számítva $F_{45} = 0{,}84752$ ebből $F_{45} = 0{,}84740$ ennélfogva végre hiányra

hosszát $F = -4\pi\sigma l^2(1{,}600203\varphi - 0{,}\cancel{89317}\,86240\,\varphi^3)$

$T_{22\frac{1}{2}} = 0{,}57624{,}5$ $F_{22\frac{1}{2}} = 0{,}57611$ transzv. $F = +4\pi\sigma l^2(1{,}774195\varphi - 1{,}35118\varphi^3)$

ebből $V_{45} - V_0 = -4\pi\sigma l^2\, 0{,}411188$

Legújabb számítás December 8ikán. Régi

$$\left(\frac{\partial F}{\partial \varphi}\right)_0 = -(2\alpha_2 + 4\alpha_4 + 6\alpha_6 + 8\alpha_8 + 10\alpha_{10}) = -1{,}600203$$

$$\times \quad \left(\frac{\partial F}{\partial \varphi}\right)_{90} = -(-2\alpha_2 + 4\alpha_4 - 6\alpha_6 + 8\alpha_8 - 10\alpha_{10}) = +1{,}774195$$

$$F_{45} = -(\alpha_2 - \alpha_6 + \alpha_{10}) = -0{,}847520$$

$$\frac{V_{45} - V_0}{4\pi\sigma} = +\frac{\alpha_2}{2} + \frac{\alpha_4}{2} + \frac{\alpha_6}{6} + \frac{\alpha_{10}}{10} = +\cancel{0{,}412003}\ +0{,}412332$$

$$+ \quad \frac{V_{90} - V_{45}}{4\pi\sigma} = +\frac{\alpha_2}{2} - \frac{\alpha_4}{2} + \frac{\alpha_6}{6} + \frac{\alpha_{10}}{10} = +\cancel{0{,}434121}\ 0{,}433796$$

$$F = -4\pi\sigma l^2\left\{0{,}846460 \sin 2\vartheta - \overset{0{,}021464}{\cancel{0{,}022122}} \sin 4\vartheta - 0{,}001020 \sin 6\vartheta - 0{,}000142{,}5 \sin 8\vartheta + 0{,}000040 \sin 10\vartheta\right\}^{+)}$$

ebből $F_{22\frac{1}{2}}$-re $= 0{,}576324$ helyette vagyon $0{,}576245$

Ugyanígy számítva $F_{67\frac{1}{2}} = 0{,}619560$

ebből végső hiány φ-re

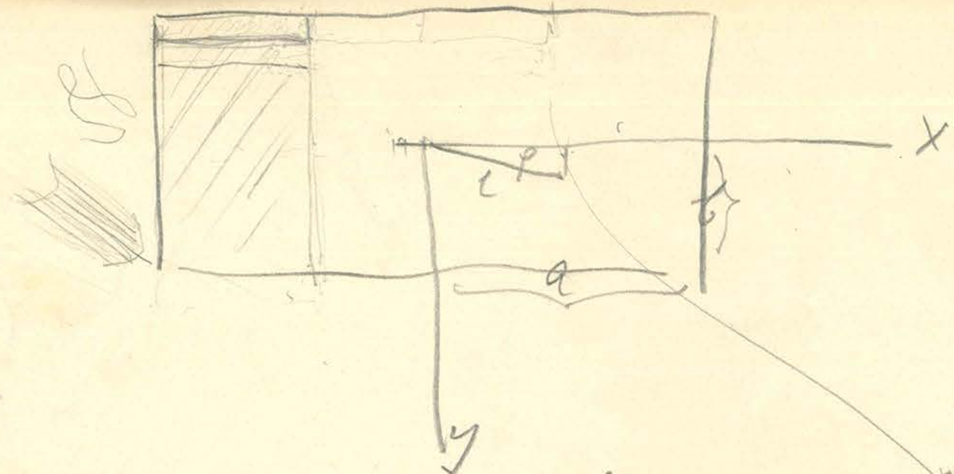
~~hossz.~~ $\cancel{\left(\frac{\partial F}{\partial \varphi}\right)_0}$ = longitudinális $F_l = -4\pi\sigma l^2(1{,}600208\varphi - 0{,}878208\varphi^3)$

transzverzális $F_t = +4\pi\sigma l^2(1{,}774192\varphi - 1{,}318022\varphi^3)$

~~transzv.~~ $\cancel{\left(\frac{\partial F}{\partial \varphi}\right)_{90}}$ =

+) ennek maximum 46° 25′ 2″ -nél $F_{max} = 0{,}849615$

$Yl\cos\varphi =$



$\varrho^2 = (a-l)^2 + b^2 + c^2$

$\varrho'^2 = (a+l)^2 + b^2 + c^2$

$$\frac{1}{(a-l)^2+b^2} - \frac{1}{(c+\varrho)\varrho} = \frac{c}{\varrho\,[(a-l)^2+b^2]}$$

egy fobra

$$Yl\cos\varphi = -4f\sigma l^2\left[\Big|_c^{b}{}_{a-l} + \Big|_c^{b}{}_{a+l}\right]\varphi - 4f\sigma l^2\left\{\frac{l^2}{6}\frac{(a-l)bc}{(b^2\varrho^2+(a-l)^2c^2)\varrho}\left[-3+2\frac{(b^2+\varrho^2)^2}{b^2\varrho^2+(a-l)^2c^2}+\frac{b^2}{\varrho^2}\right] + \frac{l^2}{6}\frac{(a+l)bc}{(b^2\varrho'^2+(a+l)^2c^2)\varrho'}\left[-3+2\frac{(b^2+\varrho'^2)^2}{b^2\varrho'^2+(a+l)^2c^2}+\frac{b^2}{\varrho'^2}\right] - \right.$$

$$\left. -\frac{2}{3}\Big|_c^{b}{}_{a-l} - \frac{2}{3}\Big|_c^{b}{}_{a+l} + \frac{bl}{2}\left[\frac{1}{(a-l)^2+b^2} - \frac{1}{(c+\varrho)\varrho} - \frac{1}{(a+l)^2+b^2} + \frac{1}{(c+\varrho')\varrho'}\right]\right\}\varphi^3 - \ldots$$

$$Xl\sin\varphi = -4f\sigma l\left\{(a+l)\Big|_c^{b}{}^{a+l} + b\Big\|_c^{b}{}^{a+l} + c\Big|\!\Big|\!\Big|_c^{b}{}^{a+l} - (a-l)\Big|_c^{b}{}^{a-l} - b\Big\|_c^{b}{}^{a-l} - c\Big|\!\Big|\!\Big|_c^{b}{}^{a-l}\right\}\varphi$$

$$+\frac{2}{3}f\sigma l\left[\left\{(a+l)\Big|_c^{b}{}^{a+l} + b\Big\|_c^{b}{}^{a+l} + c\Big|\!\Big|\!\Big|_c^{b}{}^{a+l} - (a-l)\Big|_c^{b}{}^{a-l} - b\Big\|_c^{b}{}^{a-l} - c\Big|\!\Big|\!\Big|_c^{b}{}^{a-l}\right\} + 6l\Big|_c^{b}{}^{a-l} + 3bcl^2\left(\frac{1}{\varrho[(a-l)^2+b^2]} - \frac{1}{\varrho'[(a+l)^2+b^2]}\right)\right]\varphi^3$$

$\frac{1}{6l}$

Négyzoszlop.

I longitudinális alhás

$a = 44{,}80 \quad b = 14{,}925 \quad c = 29{,}25 \quad l = 12{,}986$

$a + l = 57{,}786 \quad a - l = 31{,}814$

$$\frac{l^2}{6}\frac{(a-l)\,bc}{(b^2 s^2 + (a-l)^2 c^2)\,s}\left[-3 + 2\frac{(b^2+s^2)^2}{b^2 s^2 + (a-l)^2 c^2} + \frac{b^2}{s^2}\right] = 0{,}0266145$$

$$\frac{l^2}{6}\frac{(a+l)\,bc}{(b^2 s'^2 + (a+l)^2 c^2)\,s'}\left[-3 + 2\frac{(b^2+s'^2)^2}{b^2 s'^2 + (a+l)^2 c^2} + \frac{b^2}{s'^2}\right] = 0{,}0182282$$

longitudinális $Y l \cos\varphi - X l \sin\varphi = -4 f \sigma l^2 (1{,}61208\varphi - 1{,}03378\varphi^3)$
$= -4 f \sigma l^2\, 1{,}61208(\varphi - 0{,}641273\varphi^3)$

transversális $Y l \cos\varphi - X l \sin\varphi = +4 f \sigma l^2 (1{,}74467\varphi - 1{,}03146\varphi^3)$
$= +4 f \sigma l^2\, 1{,}74467(\varphi - 0{,}591206\varphi^3)$

II transversális alhás

$$\frac{l^2}{6}\frac{(a-l)\,bc}{(b^2 s^2 + (a-l)^2 c^2)\,s}\left[\text{mint fent}\right] = 0{,}0013779$$

$$\frac{l^2}{6}\frac{(a+l)\,bc}{(b^2 s'^2 + (a+l)^2 c^2)\,s'}\left[\text{mint fent}\right] = 0{,}0118881$$

$a = 3 \quad b = 1 \quad c = 2 \quad l = 1\text{re}$

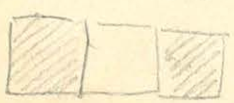
longit. $Y l \cos\varphi - X l \sin\varphi = -4 f \sigma l^2 (1{,}60020\varphi - 1{,}020563\varphi^3)$

Quadratikus oszlop

$a = b = 14{,}925$
$c = 29{,}25$
$l = 12{,}986$

$Y l \cos\varphi - X l \sin\varphi = +4 f \sigma l^2 (0{,}48768\varphi - 0{,}42722\varphi^3)$
$= +4 f \sigma l^2\, 0{,}48768(\varphi - 0{,}876026\varphi^3)$

Eredeti tégla oszlop



longitudinális $Y l \cos\varphi - X l \sin\varphi = -4 f \sigma l^2 (2{,}09976\varphi - 1{,}46100\varphi^3) = -4 f \sigma l^2\, 2{,}09976(\varphi - 0{,}695795\varphi^3)$

transversális $Y l \cos\varphi - X l \sin\varphi = +4 f \sigma l^2 (1{,}256999\varphi - 0{,}61424\varphi^3) = +4 f \sigma l^2\, 1{,}25699(\varphi - 0{,}488669\varphi^3)$

Amplitud. corr. Dinyspeny nélkül 1898 ~~Nov.~~ 24.

$$\frac{d^2\varphi}{dt^2} = -\frac{\tau}{K}\varphi + a\varphi + b\varphi^3 \qquad A = \frac{\pi^2}{T_0^2} - a$$

longit. állásra $a = -2{,}0997\,6.4/5$

transversális állásra $a = +1{,}25\,699.4/5$

$$\frac{d^2\varphi}{dt^2} = -A\varphi + b\varphi^3$$

longit. állásra $b = +1{,}46100.4/5$

transversális állásra $b = -0{,}61424.4/5$

$$\left(\frac{d\varphi}{dt}\right)^2 = -A\varphi^2 + \frac{b}{2}\varphi^4 + C$$

Ha $\varphi = \alpha$ akkor $\frac{d\varphi}{dt} = 0$

$$0 = -A\alpha^2 + \frac{b}{2}\alpha^4 + C$$

$$\left(\frac{d\varphi}{dt}\right)^2 = +A(\alpha^2-\varphi^2) - \frac{b}{2}(\alpha^4-\varphi^4)$$

$$dt = \frac{d\varphi}{\sqrt{A(\alpha^2-\varphi^2) - \frac{b}{2}(\alpha^4-\varphi^4)}} = \frac{d\varphi}{\sqrt{A(\alpha^2-\varphi^2)}}\left(1 + \frac{1}{4}\frac{b}{A}(\alpha^2+\varphi^2)\right)$$

$$\cancel{= \frac{d\varphi}{\sqrt{A(\alpha^2-\varphi^2)}}}$$

$$dt = \frac{d\varphi}{\sqrt{A}\sqrt{\alpha^2-\varphi^2}} + \frac{1}{4}\frac{b}{A^{\frac{3}{2}}}\alpha^2\frac{d\varphi}{\sqrt{\alpha^2-\varphi^2}} + \frac{1}{4}\frac{b}{A^{\frac{3}{2}}}\frac{\varphi^2 d\varphi}{\sqrt{\alpha^2-\varphi^2}}$$

$$t = \frac{1}{\sqrt{A}}\left(1 + \frac{1}{4}\frac{b}{A}\alpha^2\right)\int_{-\alpha}^{+\alpha}\frac{d\varphi}{\sqrt{\alpha^2-\varphi^2}} + \frac{1}{4}\frac{b}{A^{\frac{3}{2}}}\int_{-\alpha}^{+\alpha}\frac{\varphi^2 d\varphi}{\sqrt{\alpha^2-\varphi^2}}$$

$$\int\frac{d\varphi}{\sqrt{\alpha^2-\varphi^2}} = \Big|_{-\alpha}^{+\alpha} \arcsin\frac{\varphi}{\alpha} = \pi \qquad \int_{-\alpha}^{+\alpha}\frac{\varphi^2 d\varphi}{\sqrt{\alpha^2-\varphi^2}} = -\frac{\varphi\sqrt{\alpha^2-\varphi^2}}{2} + \frac{\alpha^2}{2}\Big|\arcsin\frac{\varphi}{\alpha}$$

$$= \frac{\alpha^2}{2}\pi$$

$$T = \frac{1}{\sqrt{A}}\left(1 + \frac{1}{4}\frac{b}{A}\alpha^2\right)\pi + \frac{1}{8}\frac{b}{A^{\frac{3}{2}}}\alpha^2\pi = \cancel{\frac{1}{\sqrt{A}}} = T_0\left(1 + \frac{3}{8}\frac{b}{A}\alpha^2\right)$$

$$= T_0\left(1 + \frac{3}{8}b\frac{T_0^2}{\pi^2}\alpha^2\right)$$

ennél longitudinális $T_0 = 641{,}15$ re $T = T_0(1 + 0{,}067983\,\alpha^2) = 641{,}15 + 43{,}587\,\alpha^2$

transversális $T_0 = 859{,}8$ re $T = T_0(1 - 0{,}051400\,\alpha^2 = 859{,}8 - 44{,}194\,\alpha^2$

$f = 0{,}000000$ abbr

$\sigma = 1{,}2$

$\alpha = \frac{1}{16}$ re longit. $T = 641{,}15 + 0{,}1703$

transversál $T = 859{,}8 - 0{,}1726$

$a-l=1{,}929 \qquad a+l=27{,}911$

$\cancel{a = \ldots}\, b = \quad a = b = 14{,}925 \qquad l = 12{,}986 \qquad c = 29{,}25$

$\mathrm{I}_{c}^{\substack{a\\b-l}} \qquad \mathrm{I}_{c}^{\substack{a\\b+l}}$

$\mathrm{I}_{c}^{\substack{a\\b-l}} = 0{,}112414$

$\mathrm{I}_{c}^{\substack{a\\b+l}} = 0{,}903489$

$\mathrm{I}_{c}^{\substack{a+l\\b}} = 0{,}348140$

$\mathrm{I}_{c}^{\substack{a-l\\b}} = 1{,}425716$

$\log a = 1{,}173914$

$\log l^2 = 2{,}226950$

$\log a^2 = 2{,}347828$

$\log (a+l)^2 = 2{,}891550$

$\log (a-l)^2 = 0{,}575156$

$\log c^2 = 2{,}932252$

$a^2 = 222{,}755$

$c^2 = 855{,}563$

$(a+l)^2 = 779{,}022$

$(a-l)^2 = 3{,}75973$

$\log l = 1{,}113475$

$\log c = 1{,}466126$

$\log (a-l) = 0{,}287578$

$\log (a+l) = 1{,}445775$

$$\mathrm{II}_{c}^{\substack{a+l\\b}} - \mathrm{II}_{c}^{\substack{a-l\\b}} = \log \frac{\sqrt{(a+l)^2+a^2}}{\sqrt{(a-l)^2+a^2}} \cdot \frac{c+\sqrt{(a-l)^2+a^2+c^2}}{c+\sqrt{(a+l)^2+a^2+c^2}} = 0{,}591321$$

$$\mathrm{III}_{c}^{\substack{a+b\\b}} - \mathrm{III}_{c}^{\substack{a-l\\b}} = \log \frac{\sqrt{(a+l)^2+c^2}}{\sqrt{(a-l)^2+c^2}} \cdot \frac{a+\sqrt{(a-l)^2+a^2+c^2}}{a+\sqrt{(a+l)^2+a^2+c^2}} = 0{,}128121$$

$\cancel{\log \sqrt{a^2+c^2}} =$

$\log \sqrt{a^2+(a-l)^2+c^2} = 1{,}517129$

$\log \sqrt{a^2+(a+l)^2+c^2} = 1{,}634446$

$\log \sqrt{(a+l)^2+a^2} = 1{,}500365$

$\log \sqrt{(a-l)^2+a^2} = 1{,}177548$

$\log \sqrt{(a+l)^2+c^2} = 1{,}606700$

$\log \sqrt{(a-l)^2+c^2} = 1{,}467078$

$32{,}8949 = \sqrt{a^2+(a-l)^2+c^2} = \sqrt{1082{,}078}$

$43{,}0969 = \sqrt{a^2+(a+l)^2+c^2} = \sqrt{1857{,}340}$

$31{,}6494 = \sqrt{(a+l)^2+a^2} = \sqrt{1001{,}777}$

$15{,}0504 = \sqrt{(a-l)^2+a^2} = \sqrt{226{,}575}$

$$Y l\cos\varphi - X l\sin\varphi = -4/\sigma l^2\varphi\left[1{,}61208\right] - 4/\sigma l^2\left[0{,}0448427 - 1{,}28541 + 0{,}061006 + 0{,}145785\right]\varphi^3$$

04484
06101
14578
25163

128541
25163
1,03378

3,85624

longitudinalis $\quad Y l\cos\varphi - X l\sin\varphi = -4/\sigma l^2(1{,}61208\varphi - 1{,}03378\varphi^3)$

$$= -4/\sigma l^2\, 1{,}61208(\varphi - 0{,}641273\varphi^3)$$

0,014429
0,207286
0,807043

$$Y l\cos - X l\sin\varphi = \cancel{-4/\sigma l^2\varphi\, 0{,}31691 - 4/\sigma l^2}\left[\cancel{0{,}0132660} -\right.$$

$$= +4/\sigma l^2\varphi\, 1{,}74467 - 4/\sigma l^2\left[0{,}0132660 - 0{,}111273 + 0{,}383597 + 0{,}745865\right]\varphi^3$$

longs. $= +4/\sigma l^2(1{,}74467\varphi - 1{,}03146\varphi^3) \pm 4/\sigma l^2\, 1{,}74467(\varphi - 0{,}591206\varphi^3)$

69382

0,111273

0,0132660
383597
745865
1,142728
111273
1,031455

0,013452
241713
0,771735

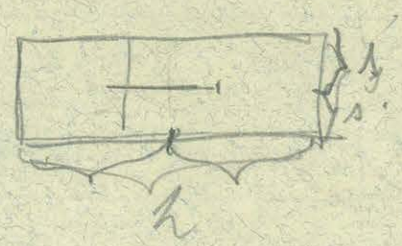
Nagy lengés értékének formulája.

Az ~~[illegible]~~ fal fél hossza = h

fél szélessége = s

fél magassága = m

A lengő könnyű fél fogás hossza = l



$h-l$
$2h-2l$ $\quad 2N = 2h\ldots$

I

A könnyű egység forgásnyomatékának értéke lesz igy pontosan

I longitudinális állás $\mathfrak{F}$

$$\operatorname{arctg}\frac{bc}{a\sqrt{a^2+b^2+c^2}} = \mathrm{I}\,{}^{a}_{b}{}_{c}$$

$$\log\frac{\sqrt{a^2+b^2}\,(c+\sqrt{b^2+c^2})}{b\,(c+\sqrt{a^2+b^2+c^2})} = \mathrm{II}\,{}^{a}_{b}{}_{c}$$

$$\log\frac{\sqrt{a^2+c^2}\,(b+\sqrt{b^2+c^2})}{c\,(b+\sqrt{a^2+b^2+c^2})} = \mathrm{III}\,{}^{a}_{b}{}_{c}$$

$$\mathfrak{F}\left\{\begin{aligned} &= -4f\sigma l^2\left\{\mathrm{I}\,{}^{s}_{h-l}{}_{m} + \mathrm{I}\,{}^{s}_{h+l}{}_{m}\right\}\omega \\ &+ 4f\sigma l\left\{(h+l)\,\mathrm{I}\,{}^{h+l}_{s}{}_{m} + s\,\mathrm{II}\,{}^{h+l}_{s}{}_{m} + m\,\mathrm{III}\,{}^{h+l}_{s}{}_{m} - (h-l)\,\mathrm{I}\,{}^{h-l}_{s}{}_{m} - s\,\mathrm{II}\,{}^{h-l}_{s}{}_{m} - m\,\mathrm{III}\,{}^{h-l}_{s}{}_{m}\right\} \end{aligned}\right.$$

igen hosszúra

$$\mathfrak{F} = -4f\sigma l^2\left\{\mathrm{I}\,{}^{s}_{h-l}{}_{m} + \mathrm{I}\,{}^{s}_{h+l}{}_{m}\right\}\omega + 4f\sigma l\omega\left\{(h+l)\,\mathrm{I}\,{}^{h+l}_{s}{}_{m} + s\,\mathrm{II}\,{}^{h+l}_{s}{}_{m} + m\,\mathrm{III}\,{}^{h+l}_{s}{}_{m} - (h-l)\,\mathrm{I}\,{}^{h-l}_{s}{}_{m} - s\,\mathrm{II}\,{}^{h-l}_{s}{}_{m} - m\,\mathrm{III}\,{}^{h-l}_{s}{}_{m}\right\}$$

II transversális állás $\mathfrak{T}$)

$$\mathfrak{T}) = -4f\sigma l^2\left\{\mathrm{I}\,{}^{h}_{s-l}{}_{m} + \mathrm{I}\,{}^{h}_{s+l}{}_{m}\right\}\omega + 4f\sigma l\omega\left\{(s+l)\,\mathrm{I}\,{}^{s+l}_{h}{}_{m} + h\,\mathrm{II}\,{}^{s+l}_{h}{}_{m} + m\,\mathrm{III}\,{}^{s+l}_{h}{}_{m} - (s-l)\,\mathrm{I}\,{}^{s-l}_{h}{}_{m} - h\,\mathrm{II}\,{}^{s-l}_{h}{}_{m} - m\,\mathrm{III}\,{}^{s-l}_{h}{}_{m}\right\}$$

A nagy eszköz geometriai adatai $h = 44{,}80$

~~[illegible]~~ $\quad s = 14{,}925$

~~[illegible]~~ $\quad m = 29{,}25$

~~[illegible]~~

$l = 12{,}986$

$h = 44{,}80$ | $s = 14{,}925$ | $m = 29{,}25$ | $l = 12{,}986$ | $h-l = 31{,}814$ | $h+l = 57{,}786$ | $s-l = 1{,}939$ | $s+l = 27{,}911$

a	b	c	I	II	III
14,925	31,814	29,25	$\mathrm{I}^{s}_{\substack{h-l\\m}}$ 0,93806		
14,925	57,786	29,25	$\mathrm{I}^{s}_{\substack{h+l\\m}}$ 1,04006		
57,786	14,925	29,25	$\mathrm{I}^{h+l}_{\substack{s\\m}}$ 0,11318	$\mathrm{II}^{h+l}_{\substack{s\\m}}$ $\underbrace{\mathrm{II}^{h+l}_{\substack{s\\m}} - \mathrm{II}^{h-l}_{\substack{s\\m}}}$	$\mathrm{III}^{h+l}_{\substack{s\\m}}$
31,814	14,925	29,25	$\mathrm{I}^{h-l}_{\substack{s\\m}}$ 0,29157	$\mathrm{II}^{h-l}_{\substack{s\\m}}$	$\mathrm{III}^{h-l}_{\substack{s\\m}}$
44,80	1,939	29,25	$\mathrm{I}^{h}_{\substack{s-l\\m}}$ 0,02364		
44,80	27,911	29,25	$\mathrm{I}^{h}_{\substack{s+l\\m}}$ 0,29327		
27,911	44,80	29,25	$\mathrm{I}^{s+l}_{\substack{h\\m}}$ 0,66119	$\mathrm{II}^{s+l}_{\substack{h\\m}}$	$\mathrm{III}^{s+l}_{\substack{h\\m}}$
1,939	44,80	29,25	$\mathrm{I}^{s-l}_{\substack{h\\m}}$ 1,49173	$\mathrm{II}^{s-l}_{\substack{h\\m}}$	$\mathrm{III}^{s-l}_{\substack{h\\m}}$

$$\mathrm{II}^{h+l}_{\substack{s\\m}} - \mathrm{II}^{h-l}_{\substack{s\\m}} = \log \frac{\sqrt{(h+l)^2+s^2}\,\left(m+\sqrt{(h-l)^2+s^2+m^2}\right)}{\sqrt{(h-l)^2+s^2}\,\left(m+\sqrt{(h+l)^2+s^2+m^2}\right.} = 0{,}28541$$

log vulg $= 0{,}45546-1$

$$\mathrm{II}^{s+l}_{\substack{h\\m}} - \mathrm{II}^{s+l}_{\substack{h\\m}} = \log \frac{\sqrt{(s+l)^2+h^2}\,\left(m+\sqrt{(s-l)^2+h^2+m^2}\right.}{\sqrt{(s-l)^2+h^2}\,\left(m+\sqrt{(s+l)^2+h^2+m^2}\right.} = 0{,}08398$$

log vulg $= 0{,}92427-2$

$$\mathrm{III}^{h+l}_{\substack{s\\m}} - \mathrm{III}^{h-l}_{\substack{s\\m}} = \log \frac{\sqrt{(h+l)^2+m^2}\,\left(s+\sqrt{(h-l)^2+s^2+m^2}\right)}{\sqrt{(h-l)^2+m^2}\,\left(s+\sqrt{(h+l)^2+s^2+m^2}\right.} = 0{,}11041$$

log vulg $= 0{,}04301-1$

$$\mathrm{III}^{s+l}_{\substack{h\\m}} - \mathrm{III}^{s-l}_{\substack{h\\m}} = \log \frac{\sqrt{(s+l)^2+m^2}\,\left(h+\sqrt{(s-l)^2+h^2+m^2}\right)}{\sqrt{(s-l)^2+m^2}\,\left(h+\sqrt{(s+l)^2+h^2+m^2}\right.}$$

0,25458

log vulg $= 0{,}40582-1$

$$\sqrt{(h-l)^2+s^2+m^2} = 45{,}722$$
$$\sqrt{(h+l)^2+s^2+m^2} = 66{,}463$$
$$\sqrt{(s+l)^2+h^2+m^2} = 60{,}346$$
$$\sqrt{(s-l)^2+h^2+m^2} = 53{,}529$$

$\cancel{1{,}939^2 =}$

$1{,}939^2 = 3{,}7598$
$14{,}925^2 = 222{,}75$
$27{,}911^2 = 779{,}00$
$31{,}814^2 = 1012{,}14$
$44{,}80^2 = 2007{,}04$
$57{,}786^2 = 3339{,}21$
$29{,}25^2 = 855{,}58$

$\cancel{1{,}939^2 = 14{,}925}$

$\log 1{,}939 = 0{,}28758$
$\log 14{,}925 = 1{,}17391$
$\log 27{,}911 = 1{,}44577$
$\log 31{,}814 = 1{,}50262$
$\log 44{,}80 = 1{,}65128$
$\log 57{,}786 = 1{,}76182$
$\log 29{,}25 \; 1{,}46613$

$l = 6{,}5$ | $h = 44{,}80$ | $s = 14{,}925$ | $m = 29{,}25$ | $h+l = 51{,}3$ | $h-l = 38{,}3$ | $s+l = 21{,}425$ | $s-l = 8{,}425$

II

x	$\log v\, x$	$\log v\, x^2$	x^2	
$l = 6{,}5$	0,81291	1,62582	42,249	
$h = 44{,}8$	1,65128	3,30256	2007,04	
s 14,925	1,17391	2,34782	222,75	
m 29,25	1,46613	2,93226	855,58	
$h+l$ 51,3	1,71012	3,42024	2641,7	
$h-l$ 38,3	1,58320	3,16640	1466,9	
$s+l$ 21,425	1,33092	2,66184	459,03	
$s-l$ 8,425	0,92557	1,85114	70,980	

$\log v \sqrt{(h-l)^2+s^2+m^2} = 1{,}70287$ | $\sqrt{} = 50{,}451$

$\log v \sqrt{(h+l)^2+s^2+m^2} = 1{,}78527$ | $\sqrt{} = 60{,}992$

$\log v \sqrt{(s-l)^2+h^2+m^2} = 1{,}73370$ | $\sqrt{} = 54{,}162$

$\log v \sqrt{(s+l)^2+h^2+m^2} = 1{,}76070$ | $\sqrt{} = 57{,}637$

	log tg	arcus	I	log I
s, $h-l$, m	10,17255	56° 5′ 38″	I 0,97901	$\log\sqrt{I}$ 0,99079 −1
s, $h+l$, m	10,21707	58° 45′ 28″	I 1,02552	log I 0,01094
$h-l$, s, m	9,35297	12° 43′ 52″	I 0,22220	log I 0,34674 −1
$h+l$, s, m	9,14465	7° 56′ 35″	I 0,13863	log I 0,14186 −1
h, $s-l$, m	9,00672	5° 47′ 57″	I 0,10122	log I 0,00527 −1
h, $s+l$, m	9,38507	13° 38′ 30″	I 0,23809	log I 0,37674 −1
$s-l$, h, m	10,45814	70° 41′ 2″	I 1,22267	log I 0,09120
$s+l$, h, m	10,02579	46° 42′ 0″	I 0,81507	log I 0,91119 −1

Tegyük $m = \frac{[illegible]}{l}$ kicsiny

$s = l$ akkor

tehát $$\frac{\Phi}{4\pi\sigma\omega} = -l^2\left(\frac{m(h-l)}{l\sqrt{(h-l)^2+l^2}} + \frac{m(h+l)}{l\sqrt{l^2+(h+l)^2}}\right) + l(h+l)\frac{lm}{(h+l)\sqrt{l^2}} - l(h-l)\frac{lm}{(h-l)\sqrt{l^2}} - [illegible]$$

$$+ lm \log \frac{(h+l)(l+\sqrt{(h-l)^2+l^2})}{(h-l)(l+\sqrt{(h+l)^2+l^2})}$$

$$\frac{\Phi}{4\pi\sigma\omega} = -l^2\left(\frac{2lm}{l\sqrt{4l^2+h^2}} + 2l^2\frac{hm}{2l\sqrt{4l^2+h^2}} + lm \log \frac{4hl}{m l(h+\sqrt{4l^2+h^2})}\right.$$

Legyen $h = 45 \quad m = 45 \quad l = s = 15$

longitudinal $\frac{\mathcal{G}}{4\sigma l^2} = -7{,}2300$

transversalis $\frac{\mathcal{D}}{4\sigma l^2} = +7{,}4744$

összeg $= 14{,}7044$

$\overset{s}{I}{}^{h}_{m} = I^{15}_{45\,45} = 1{,}11977 \quad \overset{s}{I}{}^{h}_{m} - \overset{h}{I}{}^{s}_{m} = 0{,}89426$

$\overset{h}{I}{}^{s}_{m} = I^{45}_{15\,45} = 0{,}22551$

$16\left\{\overset{s}{I}{}^{h}_{m} - \overset{h}{I}{}^{s}_{m}\right\} = 14{,}30876.$

	log val	Numerus
$II^{h+l}_{s\,m} - II^{h-l}_{s\,m}$	0,14519−1	0,13970
$II^{s+l}_{h\,m} - II^{s-l}_{h\,m}$	0,65002−2	0,04467
$III^{h+l}_{s\,m} - III^{h-l}_{s\,m}$	~~0,51964−2~~ 0,74908−2	~~0,03309~~ 0,05615
$III^{s+l}_{h\,m} - III^{s-l}_{h\,m}$	0,14748−1	0,14044

$$-\left\{ I^{s}_{h-l\,m} + I^{s}_{h+l\,m} \right\} + \frac{h+l}{l} I^{h+l}_{s\,m} - \frac{h-l}{l} I^{h-l}_{s\,m} + \frac{s}{l}\left\{ II^{h+l}_{s\,m} - II^{h-l}_{s\,m} \right\} + \frac{m}{l}\left\{ III^{h+l}_{s\,m} - III^{h-l}_{s\,m} \right\}$$

$$-2{,}00453 \quad \underbrace{+1{,}09413 - 1{,}30927 + 0{,}32077 \quad + \cancel{0{,}11890} \; \cancel{+0{,}25152}}_{\text{Summa} = \cancel{1{,}65638} \; 1{,}64538}$$

$$-\left\{ I^{h}_{s-l\,m} + I^{h}_{s+l\,m} \right\} + \frac{s+l}{l} I^{s+l}_{h\,m} - \frac{s-l}{l} I^{s-l}_{h\,m} + \frac{h}{l}\left\{ II^{s+l}_{h\,m} - II^{s-l}_{h\,m} \right\} + \frac{m}{l}\left\{ III^{s+l}_{h\,m} - III^{s-l}_{h\,m} \right\}$$

$$-0{,}33931 \quad \underbrace{+2{,}68656 - 1{,}59904 + 0{,}30788 \quad + 0{,}60197}_{}$$

Summa = + 1,68806

~~Különbség a kettő között = 3,49806~~

~~4 × 3,49806 = 13,9[illegible]~~

Különbség a kettő között = ~~3,34441~~

4 × 3,34441 = 13,37764

	log.	num.
$(h-l)^2$:	0.575 1556	3.759 72i
$(h+l)^2$:	2.891 5508	779.023 93
m^2:	2.932 2518	855.56260
s^2, h^2:	2.347 8286	222.75560
m^2+s^2:		1078.31820

$(h-l)^2+m^2+s^2 = 1082.077\,92$ 3.034 2585

$(h+l)^2+m^2+s^2 = 1857.342\,13$ 3.268 8919

$\sqrt{(h-l)^2+m^2+s^2} = 1.517\ 1292_5 : 32.894\ 95i$

$\sqrt{(h+l)^2+m^2+s^2} = 1.634\ 4459_5 : 43.096\ 895$

$h = s = 14.925$ 1.173 9143

$l = 12.986$

$m = 29.25$ 1.466 1259

$h-l = 1.939$ 0.287 5778

$h+l = 27.911$ 1.445 7754

			$\sqrt{}$
$(h-l)^2+s^2$	226.51532	2.355 0976	1.177 5488
$(h+l)^2+s^2$	1001.77953	3.000 7721	1.500 3860$_5$
$(h+l)^2+m^2$	1634.58653	3.213 4079	1.606 7039$_5$
$(h-l)^2+m^2$	859.32232	2.934 1561	1.467 0780$_5$

$\sqrt{(h-l)^2+m^2+s^2}$	32.894 95i
$\sqrt{(h+l)^2+s^2+m^2}$	43.096 895
m	29.250 . . .
s	14.925 . . .

$m+\sqrt{(-)^2\ldots}$	62.144 95i	: 1.793 4059
$m+\sqrt{(+)^2\ldots}$	72.346 895	: 1.859 4199
$s+\sqrt{(-)^2\ldots}$	47.819 951	: 1.679 6092
$s+\sqrt{(+)^2\ldots}$	58.021 895	: 1.763 5919

$\sqrt{(h+l)^2+s^2}$:	1.500 3861	3.293 7920	
$m+\sqrt{-}$:	1.793 4059		$0.256\ 8233 = \{II-III\}_{bv.}$ $II-II = 0.59i\ 3575\ [9.77i\ 850i]$
$\sqrt{(h-l)^2+s^2}$:	1.177 5488	3.036 9687	
$m+\sqrt{+}$:	1.859 4199		
$\sqrt{(h+l)^2+m^2}$:	1.606 7040	3.286 3132	
$s+\sqrt{-}$:	1.679 6092		$0.055\ 6432 = \{III-III\}_{bv.}$ $III-III = 0.128\ 1232\ [9.107\ 6278]$
$\sqrt{(h-l)^2+m^2}$:	1.467 0781	3.230 6700	
$s+\sqrt{+}$:	1.763 5919		

$b = h-l$	0.287 5778	$h+l$	1.445 7754	s	1.173 9143	s	1.173 9143
$c = m$	1.466 1259	m	1.466 1259	m:	1.466 1259	m.	1.466 1259
	1.753 7037		2.911 9013		2.640 0402		2.640 0402
$a = s$	1.173 9143	s	1.173 9143	$h+l$:	1.445 7754	$h-l$:	0.287 5778
$\sqrt{(h-l)^2+m^2+s^2}$	1.517 1293	$\sqrt{(+)^2}$	1.634 4460	$\sqrt{+}$:	1.634 4460	$\sqrt{-}$:	1.517 1293
	2.691 0436		2.808 3603		3.080 2214		1.804 7071
	9.062 6601		0.103 5410		9.559 8188		0.835 3331
	6° 35′ 22″.7		51° 45′ 58″.3		19° 56′ 49″.8		81° 41′ 15″.3
	= 0.104 7198		0.890 1179		0.33i 6126		1.413 7167
	010 1811		013 0900		016 2897		011 9264
	1067		2812		2376		0727
$\{I\}$	34		14		38		14
	0.1150110		0.903 4905		0.348 1437		1.4257172

$I^{h+l}_{\substack{s\\m}}$	9.54i 7585	$I^{h-l}_{\substack{s\\m}}$	0.154 0333
$h+l$	1.445 7754	$h-l$	0.287 5778
	0.987 5339		0.441 6111
l	1.113 4754		1.113 4754
	9.874 0585		9.328 1357
$II-II$	9.771 850i	$II-III$	9.107 6278
s	1.173 9143	m	1.466 1259
	0.945 7644		0.573 7537
l	1.113 4754		1.113 4754
	9.832 2890		9.460 2783

$I^{h-l}_{m} + I^{h+l}_{m} = 1.018\ 5015$

$II^{h+l}_{\substack{s\\m}} - II^{h-l}_{\substack{s\\m}} = 0.591\ 3575$ $\frac{s}{l} = 0.679\ 6558$

$III^{h+l}_{\substack{s\\m}} - III^{h-l}_{\substack{s\\m}} = 0.128\ 1232$ $\frac{m}{l} = 0.288\ 5880$

$I^{h+l}_{\substack{s\\m}} = 0.348\ 1437$ $\frac{h+l}{l} = 0.748\ 2704$

$I^{h-l}_{\substack{s\\m}} = 1.425\ 7172$ $\frac{h-l}{l} = 0.212\ 8804$

$-\{I+I\}$	$= -1.018\ 5015$
$+\frac{h+l}{l}I$	$+0.748\ 2704$
$-\frac{h-l}{l}I$	$-0.212\ 8804$
$+\frac{s}{l}\{II-II\}$	$0.679\ 6558$
$+\frac{m}{l}\{III-III\}$	$0.288\ 5880$
	$0.485\ 1323$

Expressio tota = 0.485 1323

II | négyzetes keresztmetszet

$s = h = 1 \quad m = 2 \quad l = 0{,}5$

$$\Big|_{m}^{s}{}^{h-l} = \operatorname{arctg} \frac{1}{\sqrt{5{,}25}} = 25^\circ 52' 07'' = 0{,}45164$$

$$\Big|_{m}^{s}{}^{h+l} = \operatorname{arctg} \frac{3}{\sqrt{7{,}25}} = 48^\circ 5' 28'' = 0{,}83905$$

$$\Big|_{m}^{h+l}{}_{0} = \operatorname{arctg} \frac{2}{1{,}5\sqrt{7{,}25}} = 26^\circ 20' 08'' = 0{,}45979$$

$$\Big|_{m}^{h-l}{}_{0} = \operatorname{arctg} \frac{4}{\sqrt{5{,}25}} = 60^\circ 10' 40'' = 1{,}05030$$

$$II_{m}^{h+l}{}_{0} = \log \frac{\sqrt{3{,}25}\,(2+\sqrt{5})}{2+\sqrt{7{,}25}} = \frac{\sqrt{3{,}25}\,(4{,}23607}{4{,}69258} = c \cdot 0{,}21150 = 0{,}48700$$

$$II_{m}^{h-l}{}_{0} = \log \frac{\sqrt{1{,}25}\,(2+\sqrt{5})}{2+\sqrt{5{,}25}} = \frac{\sqrt{1{,}25}\cdot 4{,}23607}{4{,}29129} = c \cdot 0{,}04284 = 0{,}09864$$

$$III_{m}^{h+l}{}_{0} = \log \frac{\sqrt{6{,}25}\,(1+\sqrt{5})}{2(1+\sqrt{7{,}25})} = \frac{\sqrt{6{,}25}\cdot 3{,}23607}{7{,}38516} = c \cdot 0{,}03960 = 0{,}09118$$

$$III_{m}^{h-l}{}_{0} = \log \frac{\sqrt{4{,}25}\,(1+\sqrt{5})}{2(1+\sqrt{5{,}25})} = \frac{\sqrt{4{,}25}\cdot 3{,}23607}{6{,}58258} = c \cdot 0{,}00582 = 0{,}01340$$

$\sqrt{5} = 2{,}23607$

$\sqrt{5{,}25} = 2{,}29129$

$\sqrt{1{,}25} = 1{,}11803$

$\sqrt{6{,}25} = 2{,}50000$

$\sqrt{7{,}25} = 2{,}69258$

$\sqrt{4{,}25} = 2{,}06155$

$c = 2{,}3026$

$$-\{I + I\} = -1{,}29099$$

$$+\frac{h+l}{l}\,| = +1{,}37937$$

$$-\frac{h-l}{l} = -1{,}05030$$

$$+\frac{s}{l}\{II - II\} = +0{,}77672$$

$$+\frac{m}{l}\{III - III\} = +0{,}31112$$

$$\log - \;= +0{,}12592$$

$$\begin{array}{r} 2{,}46721 \\ 2{,}34129 \\ \hline 0{,}12592 \end{array}$$

III

Vizsgáljuk meg hogy mennyire jó a legjobb

$s = l = 1 \qquad h = 3$

akkor

$${}^{1}_{2}{}_{m}\mathrm{I}^{s\,h-l}_{m} = \operatorname{arctg} \cancel{\frac{\ldots}{\ldots}} = \operatorname{arctg} \frac{2m}{\sqrt{5+m^2}}$$

$${}^{4}_{1}{}_{m}\mathrm{I}^{s\,h+l}_{m} = \operatorname{arctg} \frac{4m}{\sqrt{17+m^2}}$$

$${}^{4}_{1}{}_{m}\mathrm{I}^{h+l}_{s\,m} = \operatorname{arctg} \frac{m}{4\sqrt{17+m^2}}$$

$${}^{2}_{1}{}_{m}\mathrm{I}^{h-l}_{s\,m} = \operatorname{arctg} \frac{m}{2\sqrt{5+m^2}}$$

$${}^{3}_{0}{}_{m}\mathrm{I}^{h}_{s-l\,m} = 0$$

$${}^{3}_{2}{}_{m}\mathrm{I}^{h}_{s+l\,m} = \operatorname{arctg} \frac{2m}{3\sqrt{13+m^2}}$$

$${}^{2}_{3}{}_{m}\mathrm{I}^{s+l}_{h\,m} = \operatorname{arctg} \frac{3m}{2\sqrt{13+m^2}}$$

$${}^{0}_{3}{}_{m}\mathrm{I}^{s-l}_{h\,m} = \frac{\pi}{2}$$

I

$${}^{4}_{1}{}_{m}\mathrm{II}^{h+l}_{s\,m} - {}^{2}_{1}{}_{m}\mathrm{II}^{h-l}_{s\,m} = \log \frac{\sqrt{17}\,(m+\sqrt{5+m^2})}{\sqrt{5}\,(m+\sqrt{17+m^2})}$$

$${}^{2}_{3}{}_{m}\mathrm{II}^{s+l}_{h\,m} - \mathrm{II}^{s-l}_{h\,m} = \log \frac{\sqrt{13}\,(m+\sqrt{9+m^2})}{3\,(m+\sqrt{13+m^2})}$$

$${}^{4}_{1}{}_{m}\mathrm{III}^{h+l}_{s\,m} - \mathrm{III}^{h-l}_{s\,m} = \log \frac{\sqrt{16+m^2}\,(1+\sqrt{5+m^2})}{\sqrt{4+m^2}\,(1+\sqrt{17+m^2})}$$

$${}^{2}_{3}{}_{m}\mathrm{III}^{s+l}_{h\,m} - \mathrm{III}^{s-l}_{h\,m} = \log \frac{\sqrt{4+m^2}\,(3+\sqrt{9+m^2})}{m\,(3+\sqrt{13+m^2})}$$

$$\cancel{\text{longyt}\ \vartheta = -4\pi\sigma l^2\omega\Big[\mathrm{I}^{s}_{h-l} + \mathrm{I}^{s}_{h+l\,m} - \frac{h+l}{l}\mathrm{I}^{h+l}_{s\,m} + \frac{h-l}{l}\mathrm{I}^{h-l}_{s\,m} - \frac{s}{l}\Big(\mathrm{II}^{h+l}_{s} - \mathrm{II}^{h-l}_{s\,m}\Big) - \frac{m}{l}\Big(\mathrm{III}^{h+l}_{s\,m} - \mathrm{III}^{h-l}_{s\,m}\Big)}$$

$$\text{longyt}\ \vartheta = -4\pi\sigma l^2\omega\Big[\mathrm{I}^{s}_{h-l\,m} + \mathrm{I}^{s}_{h+l\,m} - \frac{h+l}{l}\mathrm{I}^{h+l}_{s\,m} + \frac{h-l}{l}\mathrm{I}^{h-l}_{s\,m} - \frac{s}{l}\Big(\mathrm{II}^{h+l}_{s\,m} - \mathrm{II}^{h-l}_{s\,m}\Big) - \frac{m}{l}\Big(\mathrm{III}^{h+l}_{s\,m} - \mathrm{III}^{h-l}_{s\,m}\Big)\Big]$$

$$\text{trans}\ \vartheta = -4\pi\sigma l^2\omega\Big[0 + \mathrm{I}^{h}_{s+l\,m} - \frac{s+l}{l}\mathrm{I}^{s+l}_{h\,m} + \frac{s-l}{l}\frac{\pi}{2} - \frac{h}{l}\Big(\mathrm{II}^{s+l}_{h\,m} - \mathrm{II}^{s-l}_{h\,m}\Big) - \frac{m}{l}\Big(\mathrm{III}^{s+l}_{h\,m} - \mathrm{III}^{s-l}_{h\,m}\Big)\Big]$$

$\log 2{,}3026 = 0{,}36222$

$m=\infty$

legyen $m=\infty$

akkor $m(III-II)=0$ és.

		log arc tg.	arcus fok mértékben	érték	log érték	
$\overset{0}{I}{}^{h-l}_{m}$	= arctg 2	10,30103	63°26′6″	1,10715	0,	
$\overset{0}{I}{}^{h+l}_{m}$	= arctg 4	10,60206	75°57′50″	1,32582	0,	
$I^{h+l}_{\substack{0\\m}}$	= arctg $\frac{1}{4}$ arctg 4		14° 2′ 10″	0,24498	0,	−1
$I^{h-l}_{\substack{0\\m}}$	= arctg $\frac{1}{2}$		26°33′54″	0,46365	0,	−1
$I^{h}_{\substack{3-l\\m}}$	0			0		
$I^{h}_{\substack{3+l\\m}}$	arctg $\frac{2}{3}$		33°41′25″	0,58801	0,	−1
$I^{3+l}_{\substack{h\\m}}$	arctg $\frac{3}{2}$	10,17609	56°18′35″	0,98279	0,	−1
$I^{3-l}_{\substack{h\\m}}$	$\frac{\pi}{2}$			1,57080	0,	

$$II^{h+l}_{\substack{0\\m}} - II^{h-l}_{\substack{0\\m}} = \log_n\sqrt{\frac{17}{5}} = 0,61189$$

$$II^{3+l}_{\substack{h\\m}} - II^{3-l}_{\substack{h\\m}} = \log_n\sqrt{\frac{13}{9}} = 0,18386$$

longit $\mathfrak{G} = -4 f\sigma l^2 \omega\,(1,76846$ $\qquad \mathfrak{G} - \mathfrak{D} = -4 f\sigma l^2\omega\, 3,69761$

transv. $\mathfrak{D} = -4 f\sigma l^2 \omega\,(-1,92915$ $\qquad = -f\sigma l^2\omega \times 14,79044$

$$I^{0}_{\substack{h\\m}} - I^{h}_{\substack{0\\m}} = I^{1}_{\substack{3\\\infty}} - I^{0}_{\substack{1\\\infty}} = 0,92729$$

$$16\times\left(I^{0}_{\substack{h\\m}} - I^{h}_{\substack{0\\m}}\right) = 14,7366$$

Terem

$s = l = 1 \qquad h = 2 \qquad m = \frac{13}{149} = 0{,}08725$

$m^2 = 0{,}007612$

	arctg	log arctg	[illegible] fokmértékben	értéke	
$\begin{smallmatrix} s \\ h-l \\ m \end{smallmatrix}$	$\mathrm{arctg}\,\frac{0{,}17450}{\sqrt{5{,}007612}}$	8,89~~1~~98	$4^\circ 27' 32''$	$I^{s}_{\substack{h-l\\m}}$	0,07782
$\begin{smallmatrix} s \\ h+l \\ m \end{smallmatrix}$	$\mathrm{arctg}\,\frac{0{,}34900}{\sqrt{17{,}007612}}$	8,92751	$4^\circ 50' 14''$	$I^{s}_{\substack{h+l\\m}}$	0,08442
$\begin{smallmatrix} h+l \\ s \\ m \end{smallmatrix}$	$\mathrm{arctg}\,\frac{0{,}021812}{\sqrt{17{,}007612}}$	7,72338	$0^\circ 18' 12''$	$I^{h+l}_{\substack{s\\m}}$	0,00530
$\begin{smallmatrix} h-l \\ s \\ m \end{smallmatrix}$	$\mathrm{arctg}\,\frac{0{,}043625}{\sqrt{5{,}007612}}$	8,28992	$1^\circ 7' 1''$	$I^{h-l}_{\substack{s\\m}}$	0,01949
$\begin{smallmatrix} h \\ s-l \\ m \end{smallmatrix}$	$\mathrm{arctg}\, 0$	0		$I^{h}_{\substack{s-l\\m}}$	0,~~01613~~
$\begin{smallmatrix} h \\ s+l \\ m \end{smallmatrix}$	$\mathrm{arctg}\,\frac{0{,}05817}{\sqrt{13{,}007612}}$	8,20760	$0^\circ 55' 26''$	$I^{h}_{\substack{s+l\\m}}$	0,01613
$\begin{smallmatrix} s+l \\ h \\ m \end{smallmatrix}$	$\mathrm{arctg}\,\frac{0{,}130875}{\sqrt{13{,}007612}}$	8,55976	$2^\circ 4' 44''$	$I^{s+l}_{\substack{h\\m}}$	0,02628
$\begin{smallmatrix} s-l \\ h \\ m \end{smallmatrix}$	$\mathrm{arctg}\,\infty$	$\frac{\pi}{2}$		$I^{s-l}_{\substack{h\\m}}$	1,57080

		Érték	log vagy értéke
$II^{h+l}_{\substack{s\\m}} - II^{h-l}_{\substack{s\\m}}$	$\log \frac{\sqrt{17}\,(2{,}3251}{\sqrt{5}\; 4{,}2113}$	0,017845	0,25152 −2
$II^{s+l}_{\substack{h\\m}} - II^{s-l}_{\substack{h\\m}}$	$\frac{\sqrt{13}\,.\,3{,}1000}{3\,.\,3{,}6939}$	0,008567	0,93276 −3
$III^{h+l}_{\substack{s\\m}} - III^{h-l}_{\substack{s\\m}}$	$\frac{\sqrt{4{,}0009} \times 3{,}2278}{\sqrt{2{,}0019} \times 5{,}1240}$	0,227416	0,36813 −1
$III^{s+l}_{\substack{h\\m}} - III^{s-l}_{\substack{h\\m}}$	$\frac{\sqrt{2{,}0019}\,.\,6{,}0127}{0{,}08725\,.\,6{,}6066}$	3,03886	0,48271

$$\text{hoszt} = -4\pi\sigma l^2 w \left[I^{s}_{\substack{h-l\\m}} + I^{s}_{\substack{h+l\\m}} - \frac{h+l}{l} I^{h+l}_{\substack{s\\m}} + \frac{h-l}{h} I^{h-l}_{\substack{s\\m}} - \frac{s}{l}\left(II^{h+l}_{\substack{s\\m}} - II^{h-l}_{\substack{s\\m}}\right) - \frac{m}{l}\left(III^{h+l}_{\substack{s\\m}} - III^{h-l}_{\substack{s\\m}}\right)\right]$$

$$-4\pi\sigma l^2\, 0{,}11581 = -4\pi\sigma l^2 (0{,}07782 + 0{,}08442 - 0{,}02120 + 0{,}01299 - 0{,}01785 - 0{,}02037$$

$$\text{hossz} \; -4\pi\sigma l^2 w \left[I^{h}_{\substack{s+l\\m}} - \frac{s+l}{l} I^{s+l}_{\substack{h\\m}} - \frac{h}{l}\left(II^{s+l}_{\substack{h\\m}} - II^{s-l}_{\substack{h\\m}}\right) - \frac{m}{l}\left(III^{s+l}_{\substack{h\\m}} - III^{s-l}_{\substack{h\\m}}\right)\right.$$

$$+4\pi\sigma l^2\, 0{,}34727 = 0{,}01613 - 0{,}07256 - 0{,}025701 - 0{,}26514$$

Különbség $(\mathfrak{G} - \mathfrak{I}) = -4\pi\sigma l^2 w \; 0{,}23146$

Ennek $4\left(I^{s}_{\substack{h\\m}} - I^{h}_{\substack{s\\m}}\right) =$

$= 0{,}29344$

$s = l = 1$ $h = 3$ $m = \frac{211}{149} = 1{,}41611$ $\log m = 0{,}15109$ $m^2 = 2{,}0053$ VI

	arctg	log arctg	[illegible]		
s 1 / $h-l$ 2 / m m	arctg $\frac{2{,}8322}{\sqrt{7{,}0053}}$	10,02941	46°56'19"	$I^{s}_{h-l,m}$	0,81923
s 1 / $h+l$ 4 / m m	arctg $\frac{5{,}6644}{\sqrt{19{,}0053}}$	10,11371	52°25'0"	$I^{s}_{h+l,m}$	0,91484
$h+l$ 4 / s 1 / m m	arctg $\frac{0{,}35403}{\sqrt{19{,}0053}}$	8,90959	4°28'33"	$I^{h+l}_{s,m}$	0,08102
$h-l$ 2 / s 1 / m m	arctg $\frac{0{,}70806}{\sqrt{7{,}0053}}$	9,42736	14°58'36"	$I^{h-l}_{s,m}$	0,26139
h 3 / $s+l$ 2 / m m	arctg $\frac{0{,}9441}{\sqrt{15{,}0053}}$	9,38690	13°41'50"	$I^{h}_{s+l,m}$	0,23906
$s+l$ 2 / h 3 / m m	arctg $\frac{2{,}12418}{\sqrt{15{,}0053}}$	9,73907	28°44'20"	$I^{s+l}_{h,m}$	0,50159

$\sqrt{7{,}0053} = 2{,}6468$ $\sqrt{17{,}0053} = 3{,}3174$ $\sqrt{15{,}0053} = 3{,}8736$ $\sqrt{19{,}0053} = 4{,}3595$
1,41611 1,41611 1,41611 1,41611

		cotg	log arctg
$II^{h+l}_{s,m} - II^{h-l}_{s,m}$	$\log \frac{\sqrt{17}\cdot 4{,}0629}{\sqrt{5}\cdot 5{,}7756}$	~~0,31041~~ 0,26014	~~0,05248~~ ~~0,49193−1~~ 0,41520
$II^{s+l}_{h,m} - II^{s-l}_{h,m}$	$\log \frac{\sqrt{13}\cdot 4{,}7335}{3\cdot 5{,}2897}$	~~0,20303~~ 0,07276	~~0,48148−1~~ 0,86191−2
$III^{h+l}_{s,m} - III^{h-l}_{s,m}$	$\log \frac{\sqrt{18{,}0053}\cdot 3{,}6468}{\sqrt{6{,}0053}\cdot 5{,}3595}$	0,16402	0,21488−1
$III^{s+l}_{h,m} - III^{s-l}_{h,m}$	$\log \frac{\sqrt{6{,}0053}\cdot 6{,}3174}{1{,}41611\cdot 6{,}8736}$	~~0,46563~~ 0,46405	0,66657−1

$$\log \vartheta = -4\pi\sigma l^2\omega\left[I^{s}_{h-l,m} + I^{s}_{h+l,m} - \frac{h+l}{l}I^{h+l}_{s,m} + \frac{h-l}{l}I^{h-l}_{s,m} - \frac{s}{l}\left(II^{h+l}_{s,m} - II^{h-l}_{s,m}\right) - \frac{m}{l}\left(III^{h+l}_{s,m} - III^{h-l}_{s,m}\right)\right]$$

−1,44037 ~~1,38951~~   0,81923 + 0,91484 − 0,32408 + 0,52278 − 0,~~31041~~ 0,26014 − 0,23226

$$\text{trans}\ \vartheta = -4\pi\sigma l^2\omega\left[I^{h}_{s+l,m} - \frac{s+l}{l}I^{s+l}_{h,m} - \frac{h}{l}\left(II^{s+l}_{h,m} - II^{s-l}_{h,m}\right) - \frac{m}{l}\left(III^{s+l}_{h,m} - III^{s-l}_{h,m}\right)\right]$$

~~+2,32???~~ +1,60952   0,23906 − 1,00318 − 0,21828 − 0,65712

diff ~~3,1926~~ diff = 3,07989

$4\left(I^{s}_{h,m} - I^{h}_{s,m}\right) = 3{,}00484$

2,7 3,08 / 47 / 2,61

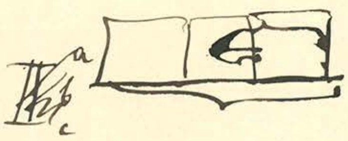
$$A = -\left\{ \Big|^{s}_{\substack{h-l\\m}} + \Big|^{s}_{\substack{h+l\\m}} \right\} + \frac{h+l}{l}\Big|^{h+l}_{\substack{s\\m}} - \frac{h-l}{l}\Big|^{h-l}_{\substack{s\\m}} + \frac{s}{l}\left\{ \Big\|^{h+l}_{\substack{s\\m}} - \Big\|^{h-l}_{\substack{s\\m}} \right\} + \frac{m}{l}\left\{ \Big|\!\Big|\!\Big|^{h+l}_{\substack{s\\m}} - \Big|\!\Big|\!\Big|^{h-l}_{\substack{s\\m}} \right\}$$

$$-1{\cdot}98651 \quad +0{\cdot}61000 - 0{\cdot}82663 \quad + \quad 0{\cdot}33268 \quad + \quad 0{\cdot}25350$$

$$B = -\left\{ \Big|^{h}_{\substack{s-l\\m}} + \Big|^{h}_{\substack{s+l\\m}} \right\} + \frac{s+l}{l}\Big|^{s+l}_{\substack{h\\m}} - \frac{s-l}{l}\Big|^{s-l}_{\substack{h\\m}} + \frac{h}{l}\left\{ \Big\|^{s+l}_{\substack{h\\m}} - \Big\|^{s-l}_{\substack{h\\m}} \right\} + \frac{m}{l}\left\{ \Big|\!\Big|\!\Big|^{s+l}_{\substack{s\\m}} - \Big|\!\Big|\!\Big|^{s-l}_{\substack{h\\m}} \right\}$$

$$+0{\cdot}325091 + \cancel{0{\cdot}25142} \; +1{\cdot}6606 - 0{\cdot}50364 + 0{\cdot}29691 \quad + \quad 0{\cdot}59472$$

$$I^{a}_{\substack{b\\c}} = \operatorname{arctg} \frac{bc}{a\sqrt{a^2+b^2+c^2}}$$



$h = 44{,}80 \qquad s = 14{,}925 \qquad m = 29{,}25 \qquad l = 11$

$h+l = 55{,}8 \qquad (h-l) = 33{,}8$

$s+l = 25{,}925 \qquad s-l = 3{,}925$

a	b	c	I
14,925	33,8	29,25	$\Big|^{s}_{\substack{h-l\\m}} = 0{\cdot}95523$
14,925	55,8	29,25	$\Big|^{s}_{\substack{h+l\\m}} = 1{\cdot}03128$
55,8	14,925	29,25	$\Big|^{h+l}_{\substack{s\\m}} = 0{\cdot}12025$
33,8	14,925	29,25	$\Big|^{h-l}_{\substack{s\\m}} = 0{\cdot}26902$
44,8	3,925	29,25	$\Big|^{h}_{\substack{s-l\\m}} = 0{\cdot}047730$
44,8	25,925	29,25	$\Big|^{h}_{\substack{s+l\\m}} = 0{\cdot}277361$
25,925	44,8	29,25	$\Big|^{s+l}_{\substack{h\\m}} = 0{\cdot}704595$
3,925	44,8	29,25	$\Big|^{s-l}_{\substack{h\\m}} = 1{\cdot}411471$

$A = -1{\cdot}61696 \qquad B = +1{\cdot}72350$

$B - A = 3{\cdot}34046$

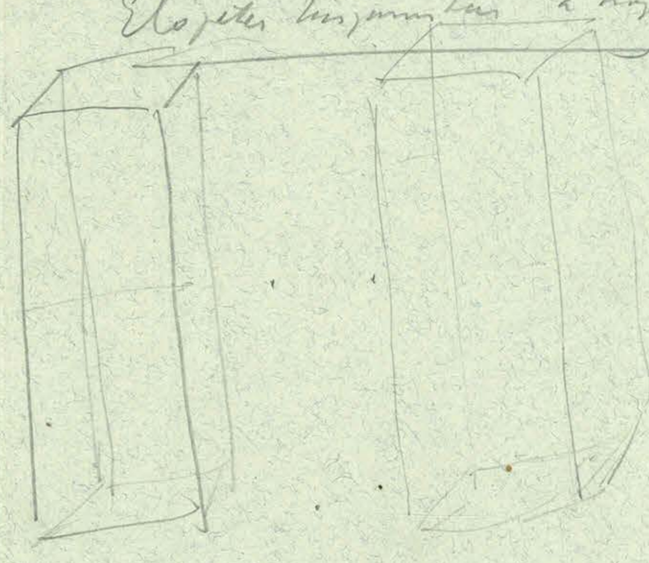
$4(B-A) = 13{\cdot}36184$

[illegible]

$$\frac{P_x}{\gamma\sigma} = a \operatorname{arc\,tg} \frac{bc}{a\sqrt{a^2+b^2+c^2}} + b \log \frac{\sqrt{a^2+b^2}\,(c+\sqrt{b^2+c^2})}{b\,(c+\sqrt{a^2+b^2+c^2})} + c \log \frac{\sqrt{a^2+c^2}\,(b+\sqrt{b^2+c^2})}{c\,(b+\sqrt{a^2+b^2+c^2})}$$

P_y

Előjeles kiszámítás a nagy lengési kísérletekhez



$$\varphi + \psi + \varphi'$$
$$\varphi + \psi + \psi''$$
$$\varphi$$

$$T'^2 = \frac{\pi^2 K}{\varphi+\psi+\varphi'}$$

$$T''^2 = \frac{\pi^2 K}{\varphi+\psi+\psi''}$$

$$\pi^2 K = \varphi T'^2$$

$$\varphi' - \psi'' = \pi^2 K \left(\frac{1}{T'^2} - \frac{1}{T''^2}\right)$$

$$\frac{\varphi' - \psi''}{\varphi} = \pi^2 K \frac{T''^2 - T'^2}{T'^2 T''^2}$$

$$\pi^2 K \cdot \frac{2T'\tau + \tau^2}{T'^4\left(1+\frac{\tau}{T'}\right)^2}$$

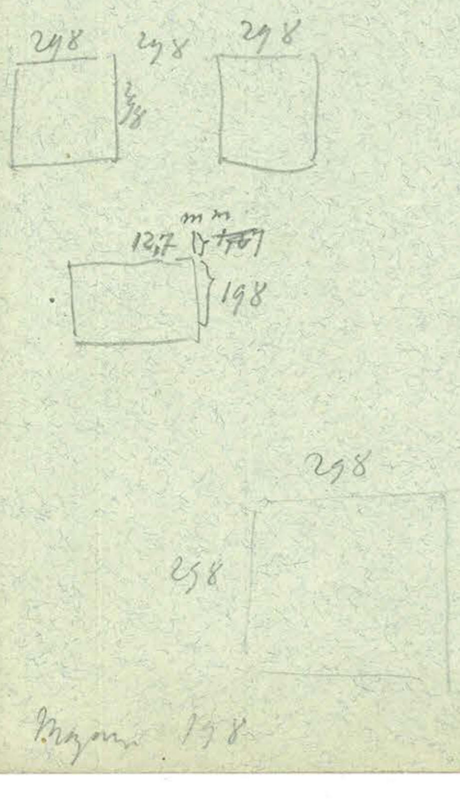
$$\pi^2 K \cdot \frac{2\frac{\tau}{T'} + \frac{\tau^2}{T'^2}}{T'^2\left(1+\frac{\tau}{T'}\right)^2}$$

$$\frac{\left(1+\frac{\tau}{T'}\right)^2 - 1}{T'^2\left(1+\frac{\tau}{T'}\right)^2}$$

$$\pi^2 K \left(\frac{1}{T'^2} - \right.$$

$$\pi^2 K \frac{1}{T'^2}\left(1 - \frac{1}{\left(1+\frac{\tau}{T'}\right)^2}\right)$$

$$\frac{\varphi' - \psi''}{\varphi} = \frac{T'^2}{T'^2 T''^2}\,\frac{T''^2 - T'^2}{}$$



35
14,26
17,76
5 06
12,7

Nagyon 198

Ullás leventben,

forgás momentum

Egyik erő mértéke

$a = 30$ $b = 45$ $c = 45$

$$\frac{P}{p_0} = \underbrace{a \operatorname{arctg} \frac{b^2}{a\sqrt{a^2+2b^2}}}_{\mathrm{I}} + \underbrace{2b \log \frac{\sqrt{a^2+b^2}(1+\sqrt{2})}{b+\sqrt{a^2+2b^2}}}_{\mathrm{II}}$$

	$\frac{b}{a}$	I	II	$\frac{P_1}{p_0}$	$\frac{b}{a} = \infty$ remény volna.
$b = 45$	1,5	0,7642	0,1239		
$a = 30$		$a\mathrm{I} = 22,926$	$2b\,\mathrm{II} = 11,151$	34,077	47,124

forgás momentum $= 15\,P_1$ m w

$\frac{2,25}{\sqrt{5,5}}$ 2,25 / 2,345

45° 47

2345 / 22500 / 0,9595
21105
13950
11725
22250
21105
11450

0,05381
2302
161430
16143
1076244
1123929
0,1239
45

11,151

,45

3,1416
94248
47,124

0,75044
136
0,76416

22,926

$\log \frac{\sqrt{3,25}\,.(1+\sqrt{2})}{1,5+\sqrt{5,5}}$

$\log \frac{\sqrt{3,25}\,.\,2,4142}{2,345+1,5}$

3,845

0,25594
0,38277
0,63871
~~0,37074~~

0,58490
1 ~~236~~

0,05381

A mási

$2 \cdot 15^2\, m\, \omega\, \pi$.

$a = 45 \quad b = 30 \quad c = 45$

$$\operatorname{arc\,tg} \frac{30}{\sqrt{30^2 + 2 \cdot 45^2}} = \operatorname{arc\,tg} \frac{1}{\sqrt{1 + 4{,}5}} = \operatorname{arc\,tg} \frac{1}{\sqrt{5{,}5}}$$

$$\operatorname{arc\,tg} \frac{1}{\sqrt{5{,}5}} = 0{,}4032$$

$$2{,}345 \,/\, 10000 \,/\, 0{,}4264$$

9380
− 6200
4690
15100
14070
10200

1,6128

23° 6'

$\cancel{1500}$ 136,308

0,40193
175
0,40018

tehát

össz forgásmomentum:

$$\left(\tau - 15 \cdot 136{,}308 \cdot m f \sigma + 15^2 \cdot 1{,}6128\, m f \sigma\right) \omega.$$

ha $m = 100$ $\quad f = \frac{6{,}6}{100} \frac{1}{m}$. $\quad \sigma = 10{,}8$

tehát:

$$-\left(\tau - 0{,}1458 + 0{,}0259\right) \omega$$

$$\underline{-(\tau - 0{,}1199)\, \omega}$$ ha b osztva van $-(\tau - 0{,}2016)\, \omega$

$$m f \sigma = \frac{71{,}28}{m}$$

Ilon. állás

Egyetlen lemez értéke volna

$15^2 \cdot 4\pi\; m\,f\sigma = (1+0{,}2016)\,w$

oldal hatás

3   $a=15$ $b=30$ $C=45$

arctg $=1{,}0132$

$a=15$ $b=60$ $C=45$

arc tg $=1{,}1691$

e szerint az oldal hatás

$15^2 \cdot 4 \cdot m\,f\sigma \cdot 1{,}0132 + 15^2\, 4\, m\,f\sigma \cdot 1{,}1691 = 0{,}1400\, w$

ebből levonandó

$15\, f\, m\,\sigma\, P_x\, w$

a hol P_x a vonzása

Vonás $a=60$ $b=15$ $C=45$

és $a=30$ $b=15$ $C=45$

$\frac{b}{a}$	$\frac{c}{a}$	I	II	III	$\frac{P_x}{f\sigma}$
$\frac{1}{4}$	$\frac{3}{4}$	0,1460	1,1434	~~4,2275~~ 0,1287	31,7025 ~~[illegible]~~
$\frac{1}{2}$	$1\frac{1}{2}$	0,3874	0,7151	~~0,0905~~ 0,0526	24,5845
					7,122

tehát a különbség

az erő $4 \times 7{,}122 = 28{,}488$

$15\, f\, m\,\sigma\, P_x = 0{,}03047$

az egész fogyás vonzása $= 0{,}1095\, w$

Előjeles számítás 40 × 40 × 80 oszlopra.

Az oldal hatása egyszeresen.

$a = 20 \quad b = c = 40$

$a = 1 \quad b = c = 2$

$\operatorname{arc\,tg} \frac{bc}{a\sqrt{a^2+b^2+c^2}} = \operatorname{arc\,tg} \frac{4}{\sqrt{9}} = \operatorname{arc\,tg} \frac{4}{3}$

$0{,}92728 \qquad = \cancel{53}\ 8' = 53^\circ\ 7{,}777'$

$\cancel{a = 19 \quad b = c = 40} = \quad 54^\circ\ 40'\ 777$

$51^\circ\ 27'\ 21''$

1 centiméter vastag szalag hatása. $\qquad 2\ 7026$

$a = 20 \quad b = c = 40$

$\cancel{ar}\ a \operatorname{arc\,tg} \frac{b^2}{a\sqrt{a^2+2b^2}} + 2b \log \frac{(1+\sqrt{2})\sqrt{a^2+b^2}}{b+\sqrt{a^2+2b^2}}$

a	b	I	II	összeg $aI + 2b\ II$
~~a = 20~~		~~b = 40~~		
20	40	0,92728	~~0,099650~~ 0,076654	~~26,9900~~ 24,6779
19	40	0,95431	0,070252	23,7521
21	40	0,90098	~~0,090331~~ 0,083446	25,5963

$\frac{19+21}{2} = 0{,}92765$

2 centiméteres szalag összhatása $= 1{,}8442$

$1{,}8546$

a = 20-nál.

$$\operatorname{arctg} \frac{bc}{a\sqrt{a^2+b^2+c^2}}$$

$a = 15$ $b = 30$ $c = 46$

225 900 2116

2116
900
225
3241

3,51068

$\operatorname{arctg} \frac{92}{\sqrt{3241}}$

1,96379
1,75534
10,20845

1,01229
426
1
1,01666

$58^\circ 15' 2'' = 1{,}01666$

$a = 15$ $b = 30$ $c = 44$

225
900
1936
3061

$\operatorname{arctg} \frac{88}{\sqrt{3061}}$

1,94448
1,74293
10,20155

3,48586

47 / 1500 / 32.
141
90

0,99484
01454
16
1,00955

$57^\circ 50' 32'' = 1{,}00955$

1,00955
1666
1,02621
~~1,01811~~
1,01311

$$\frac{\operatorname{arctg}(c=46) + \operatorname{arctg}(c=44)}{2} = 1{,}01311$$

$a = 15$ $b = 30$ $c = 40$ | 3,43537

225
900
1600
2725

$\operatorname{arctg} \frac{80}{\sqrt{2725}}$

1,90309
1,71769
10,18540

45 / 1300 / 29
400

$56^\circ 52' 28'' =$

$a = 15$ $b = 30$ $c = 50$ 3,55925

1125
2500
3625

$\operatorname{arctg} \frac{100}{\sqrt{3625}}$

2,00000
1,77966
10,22034

48 / 2600 / 54
240
200

$58^\circ 56' 54'' =$

$115, 49' 22''$

$116\ \cancel{45}' 34''$

$$-\cancel{\left\{ I^{s}_{\substack{h-l\\m}} + I^{s}_{\substack{h+l\\m}} \right\} + \frac{h+l}{l} I^{h+l}}$$

hyp

$$-\left\{ I^{s}_{\substack{h-l\\m}} + I^{s}_{\substack{h+l\\m}} \right\} + \frac{h+l}{l} I^{h+l}_{\substack{s\\m}} - \frac{h-l}{l} I^{h-l}_{\substack{s\\m}} + \frac{s}{l}\left\{ II^{h+l}_{\substack{s\\m}} - II^{h-l}_{\substack{s\\m}} \right\} + \frac{m}{l}\left\{ III^{h+l}_{\substack{s\\m}} - III^{h-l}_{\substack{s\\m}} \right\}$$

$$-1{,}97812 \quad + \underbrace{0{,}50363 - 0{,}71432 + 0{,}32804 + 0{,}24869}_{+0{,}36604} = 1{,}61208$$

tran

$$-\left\{ I^{h}_{\substack{s-l\\m}} + I^{h}_{\substack{s+l\\m}} \right\} + \frac{s+l}{l} I^{s+l}_{\substack{h\\m}} - \frac{s-l}{l} I^{s-l}_{\substack{h\\m}} + \frac{h}{l}\left\{ II^{s+l}_{\substack{h\\m}} - II^{s-l}_{\substack{h\\m}} \right\} + \frac{m}{l}\left\{ III^{s+l}_{\substack{h\\m}} - III^{s-l}_{\substack{h\\m}} \right\}$$

$$-0{,}31691 \quad + \underbrace{1{,}42110 - 0{,}22274 + 0{,}28979 + 0{,}57343}_{} = +1{,}74467$$

$$\{\ \} - \{\ \} = 3{,}35675$$

$$4 \times 3{,}35675 = 13{,}42700$$

$$I^{s}_{\substack{h\\m}} = 1{,}00673$$

$$I^{h}_{\substack{s\\m}} = \cancel{0{,}16706} = 0{,}17267$$

$$I^{s}_{\substack{h\\m}} - I^{h}_{\substack{s\\m}} = \cancel{0{,}83967}\ 0{,}83305$$

503802

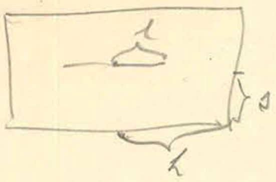
1,34347?

$$16\left\{ I^{s}_{\substack{h\\m}} - I^{h}_{\substack{s\\m}} \right\} \quad \cancel{13{,}43472}\ 13{,}3288$$

161934

$\boxed{I}$ négyzetes keresztmetszetre számítás [illegible] 1889 Oct. 6.

$$\mathfrak{J} \quad -\left\{ \Big|_{m}^{h-l}{}^{s} + \Big|_{m}^{h+l}{}^{s} \right\} + \frac{h+l}{l} \Big|_{m}^{s}{}^{h+l} - \frac{h-l}{l} \Big|_{m}^{s}{}^{h-l} + \frac{s}{l} \left\{ \mathit{II}_{m}^{s}{}^{h+l} - \mathit{II}_{m}^{s}{}^{h-l} \right\} + \frac{m}{l} \left\{ \mathit{III}_{m}^{s}{}^{h+l} - \mathit{III}_{m}^{s}{}^{h-l} \right\}$$



$$I_c^{b\,a} = \operatorname{arctg} \frac{bc}{a\sqrt{a^2+b^2+c^2}}$$

$$II_c^{b\,a} = \log \frac{\sqrt{a^2+b^2}\,(c+\sqrt{b^2+c^2})}{b\,(c+\sqrt{a^2+b^2+c^2})}$$

$$III_c^{b\,a} = \log \frac{\sqrt{a^2+c^2}\,(b+\sqrt{b^2+c^2})}{c\,(b+\sqrt{a^2+b^2+c^2})}$$

$s = h$ [illegible]

$$s = h = 1$$

$$l = s = h = 1 \qquad m = 2$$

$$\mathfrak{J} = -\Big|_{2}^{2}{}^{1} + 2\Big|_{2}^{1}{}^{2} + \mathit{II}_{2}^{1}{}^{2} + 2\,\mathit{III}_{2}^{1}{}^{2} = +0{,}55603 \ \cancel{II_2^2 - III_2^1}$$

$$\Big|_{2}^{2}{}^{1} = \operatorname{arctg} \frac{4}{3} = 53^\circ\ 2'2 = 0{,}92566$$

$$\Big|_{2}^{1}{}^{2} = \operatorname{arctg} \frac{2}{2.3} = \operatorname{arctg} \frac{1}{3} = 18^\circ\ 26' = 0{,}32172$$

$$\mathit{II}_{2}^{1}{}^{2} = \log \frac{\sqrt{5}\,(2+\sqrt{5})}{2+3} = \lg \frac{2+\sqrt{5}}{\sqrt{5}}\ \lg \frac{4{,}2361}{\sqrt{5}} = c \cdot 0{,}27748 = 0{,}63893$$

$$\mathit{III}_{2}^{1}{}^{2} = \frac{\sqrt{8}\,(1+\sqrt{5})}{2(1+3)} = \lg \frac{1+\sqrt{5}}{\sqrt{8}} = \lg \frac{3{,}2361}{\sqrt{8}} = c \cdot 0{,}05848 = 0{,}09466$$

$$c = 2{,}3026$$

1,5
1,5
1,75
2,25

0,92502
64
0,92566

1932

31416
756
32172

33106
193
33329

0,62697
34949
27748

0,51002
45154
0,05848

0,64344
63893
18932
1,48169
92566
0,55603

0,27748
2,3026
166488
55496
832440
554962
63892,5448

2,3026
0,05848
184208
92104
92208
18420
175130
0,1346604 8

14505 / 12,9860 / 0,8701
11,9400
104600
104475
12500

0,55603
8701
55603
3892210
444824
483801703

[illegible] számításaink $l = 0{,}8701\,h$ és

Expr. tehát $= 0{,}48513$

~~0,187 · 0,55603 = 0,48380~~

mikor $l = 1$ és Expr. tehát $= 0{,}55603$

$a=3 \quad b=1 \quad c=2 \quad l=1 \quad \varphi=22\tfrac{1}{2}°$ $\qquad \varphi=22\tfrac{1}{2}°.$

$I_1 = 0{,}754095$

$I_2 = 0{,}887995$ $\qquad (II-III)_1 = \cancel{0{,}0918986}\ 0{,}092083\ -5$

$1{,}642080{+}4$

$I_3 = 1{,}157715$ $\qquad (II-II)_2 = 0{,}0204378\ -2$

$I_4 = 1{,}234278$

$2{,}391993$ $\qquad (II-II)_3 = 0{,}341801$

$I_5 = 0{,}151496$

$I_6 = 0{,}070633$ $\qquad (II-II)_4 = 0{,}270155$

$0{,}222129{+}7$

$I_7 = \cancel{0{,}393290}$ $0{,}394744$

$I_8 = 0{,}199045$ $\qquad 231495$

$0{,}593789$

$(III-III)_1 = 0{,}1015\cancel{62}$ 448 115 853

$(III-III)_2 = 0{,}129\cancel{969}$ 115

$0{,}231531$ $\cancel{0{,}221301}\ -6$

$(III-III)_3 = +0{,}072829$

$0{,}153916$ $\qquad 0{,}226745{+}2$

$(III-III)_4 = 0{,}\cancel{038787}$

$0{,}226745$

0,871608
211000
373538
453490
1,909636
1,22976
0,67988

$-2f\delta l\cos\varphi \begin{cases} +2{,}27049 - 1{,}47662 \\ +0{,}19079 \\ +0{,}08019 \\ 0{,}46306 \end{cases} = 1{,}52791$

3,00453
147662
1,52791

+)
+0,871608
0,211000
0,373538
0,222232.
1,679378
1,22976
0,44962
230026
0,67988
Ezen

226746
453492
222232
230260

$+)\ +2f\delta l\sin \begin{cases} +0{,}871608 \\ +0{,}211000 \\ +0{,}373538 \end{cases}$ $\quad -1{,}22976$ $\quad -0{,}00703$ $\quad 1{,}23679$ $\quad \Big\} = \cancel{0{,}44962} = 0{,}67988$

1,456146
1,23679
0,21936

$0{,}21936$

$= \cancel{2f\delta l(-1{,}41160 + 0{,}08395) = 2f\delta l\,1{,}32765}$

$\cancel{\mathfrak{T}_{22{,}5} = 4f\delta l\ 0{,}66382}$

$\text{Expr. Tota} = 2f\delta l^2(-1{,}41160 + \cancel{0{,}17206}\ \overset{+}{0{,}26018}) = -4f\delta l^2\cdot 0{,}57571 = \cancel{4f\delta l^2\ 0{,}61977}$

Végleg kijavítva 0,576245 Eötvös Tagl

0,576238 Ilarkányi

~~Kijavítva Deák[?]~~ 0,57607

orsokarodikus utján kitöltve[?]

$a = 3 \qquad b = 1 \qquad c = 2 \qquad l = 1 \qquad \varphi = 45$ 2)

$$I_1 = \Big|_{2}^{1+\frac{1}{\sqrt{2}}}\, 3-\tfrac{1}{\sqrt{2}} = \Big| = \frac{4{,}585786}{1{,}707107\sqrt{12{,}17156}} = 0{,}656166$$

$$I_2 = \Big|_{2}^{1+\frac{1}{\sqrt{2}}}\, 3+\tfrac{1}{\sqrt{2}} = \frac{7{,}414214}{1{,}707107\sqrt{20{,}65685}} = 0{,}762694$$

$$I_3 = \Big|_{2}^{1-\frac{1}{\sqrt{2}}}\, 3-\tfrac{1}{\sqrt{2}} = \frac{4{,}585786}{0{,}292893\sqrt{9{,}34313}} = 1{,}377996$$

$$I_4 = \Big|_{2}^{1-\frac{1}{\sqrt{2}}}\, 3+\tfrac{1}{\sqrt{2}} = \frac{7{,}414214}{0{,}292893\sqrt{17{,}82842}} = 1{,}405513$$

$$I_5 = \Big|_{2}^{3+\frac{1}{\sqrt{2}}}\, 1+\tfrac{1}{\sqrt{2}} = \frac{3{,}414214}{3{,}707107\sqrt{20{,}65685}} = 0{,}199932$$

$$I_6 = \Big|_{2}^{3+\frac{1}{\sqrt{2}}}\, 1-\tfrac{1}{\sqrt{2}} = \frac{0{,}585786}{3{,}707107\sqrt{17{,}82842}} = 0{,}037409$$

$$I_7 = \Big|_{2}^{3-\frac{1}{\sqrt{2}}}\, 1+\tfrac{1}{\sqrt{2}} = \frac{3{,}414214}{2{,}292893\sqrt{12{,}17156}} = 0{,}403404$$

$$I_8 = \Big|_{2}^{3-\frac{1}{\sqrt{2}}}\, 1-\tfrac{1}{\sqrt{2}} = \frac{0{,}585786}{2{,}292893\sqrt{9{,}34313}} = 0{,}083388$$

$(\mathrm{II}-\mathrm{II})_1 = 0{,}130425$

$(\mathrm{II}-\mathrm{II})_2 = 0{,}042501$

$(\mathrm{II}-\mathrm{II})_3 = 0{,}268010$

$(\mathrm{II}-\mathrm{II})_4 = 0{,}180085$

$(\mathrm{III}-\mathrm{III})_1 = 0{,}185349$

$(\mathrm{III}-\mathrm{III})_2 = 0{,}223155$

$(\mathrm{III}-\mathrm{III})_3 = 0{,}026634$

$(\mathrm{III}-\mathrm{III})_4 = 0{,}140227$

c irányú forgásnyomaték F_{45} $= -2f\sigma l^2\, 1{,}69505$ [illegible]

0,846460
1060
0,847520

$2\alpha_2 \cos 2\vartheta + 4\alpha_4 \cos 4\vartheta + 6\alpha_6 \cos 6\vartheta + 8\alpha_8 \cos 8\vartheta + 10\alpha_{10} \cos 10\vartheta$

$-2\alpha_2 2\varepsilon - 4\alpha_4 + 6\alpha_6 6\varepsilon + 8\alpha_8 - 10\alpha_{10} 10\varepsilon = 0.$

$$\frac{4\alpha_4 - 8\alpha_8}{-4\alpha_2 + 36\alpha_6 - 100\alpha_{10}} = \varepsilon$$

− 0,085856
1140
$\alpha_2 =$ − 0,084716

− 0,385840
− 0,036720
0,422560
004000
− 0,426560

0,00057066
0,0021226.4
0,0000282

0,02472333.6
179533
0,0072800
72722
0,0000078

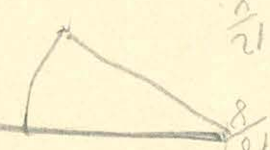
$1^\circ.25'2''$

0,0247233

0,001140

0,846460 + 4ε 0,021464 + 0,001020 − 0,000142 8ε
+ 0,000040

1020
40
0,847520
2120
0,849640
00028
$1^\circ 25' 2''$ = 0,849612
max



392050
391640

0,0000005713

$\alpha_{10} = + 0,000141007$

~~$\alpha_{14} = - 0,0001106102$~~

$\alpha_{14} = - 0,00014152032$
000513
α_{10} 141007

− 0,00097910
141007
0,00083809
195820
0,00169860
2050 0,00025960

0,0039164.0
0,00000410

$8\alpha_{10} + \frac{120}{7}\alpha_{14} = 0,00129800$

$\left(\frac{120}{7} - 8\right)\alpha_{14} = - 0,00129790$

1079057?

$\frac{120}{56}$ 64

$\frac{18}{5} - \frac{10}{5}$

$\frac{64}{7}$

a=2 b=1=1 c=2 67½°

/	/	/	/
0,417857	0,529261	0,417857	0,529261
301030	301030	301030	301030
0,718887	0,830291	0,718887	0,830291
0,284178	0,284178	0,881499 -2	0,881499 -2
0,434709	0,546113	1,837388	1,948792
0,581456	0,641015	0,517828	0,594441
0,853253 -1	0,905098 -1	1,319550	1,354351
35° 29' 56½	38° 47' 21"	87° 15' 25"	87° 28' 4"
0,6108652	0,6632257	1,5184364	1,5184364
84258	136717	43633	81449
2740	1018	1212	194
0,6195750	0,6769986	1,5229209	1,5266007

0,284178	0,881499 -2	0,284178	0,881499 -2
301030	301030	301030	301030
0,585208	0,182529 -1	0,585208	0,182529 -1
529261	0,529261	0,417857	0,417857
0,055947	0,653268 -2	0,167351	0,765672 -2
0,641015	0,594441	0,581456	0,517828
0,414932 -1	0,058827 -2	0,585895 -1	0,246834 -2
		574460	
14° 24' 22½"	0° 39' 22"	21° 4' 33½"	1° 0' 41"
0,2443461	0,0113446	0,3665191	0,0174533
98902	1067	61087	~~2276~~
1091		1624	1988
0,2543454	0,0114513	0,3727902	~~0,0176909~~
		~~20° 24' 24"~~	0,0176521
		0,3665191	
		11636	×
		1624	
		0,3678451	

$\varphi = 67\tfrac{1}{2}°$ $b = l = 1$ $c = 2$ $a = 3$

$\cos 67\tfrac{1}{2} = 0{,}382683$

$\sin 67\tfrac{1}{2} = 0{,}923880$

$a + \cos = 3{,}382683$ $\log = 0{,}529261$

$a - \cos = 2{,}617317$ $\log = 0{,}417857$

$b + \sin = 1{,}923880$ $\log = 0{,}284178$

$b - \sin = 0{,}076120$ $\log = 0{,}881499 - 2$

Quadrat.

$11{,}442544$ $\log\sqrt{(a+\cos)^2+(b+\sin)^2+c^2} = 0{,}641015$

$6{,}850348$ $\log\sqrt{(a+\cos)^2+(b-\sin)^2+c^2} = 0{,}594441$

$3{,}701314$ $\log\sqrt{(a-\cos)^2+(b+\sin)^2+c^2} = 0{,}581456$

$0{,}00579425$ $\log\sqrt{(a-\cos)^2+(b-\sin)^2+c^2} = 0{,}517838$

$\sqrt{(a+\cos)^2+(b+\sin)^2+c^2} = 4{,}375370$

$\sqrt{(a+\cos)^2+(b-\sin)^2+c^2} = 3{,}930436$

$\sqrt{(a-\cos)^2+(b+\sin)^2+c^2} = 3{,}814664$

$\sqrt{(a-\cos)^2+(b-\sin)^2+c^2} = 3{,}294869$

cdzj jö

$\Big|^{b+\tan\varphi}_{a-\tan}\Big._{c} = 0{,}6195750$

$\Big|^{b+\tan}_{a+\tan}\Big._{c} = 0{,}6769986$

$1{,}2965736$

$\Big|^{b-l}_{a-\tan}\Big._{c} = 1{,}5229209$

$\Big|^{b-l}_{a+l}\Big._{c} = 1{,}5266007$

$3{,}0495216$

$\Big|^{a+\tan}_{b+\sin}\Big._{c} = 0{,}2543454$

$\Big|^{a+\tan}_{b-\tan}\Big._{c} = 0{,}0114513$

$0{,}2657967$

$\Big|^{a-\tan}_{b+\tan}\Big._{c} = 0{,}\cancel{3727902}$ 2678451

$\Big|^{a-\tan}_{b-\tan}\Big._{c} = 0{,}017\cancel{6909}$ 521

$\cancel{0{,}3904423}$

$0{,}2854372$

$(II - II)_1 = 0{,}121929$

$(II - II)_2 = 0{,}0675325$

$(II - II)_3 = 0{,}142992$ (+4)

$(II - II)_4 = 0{,}0885966$

$(III - III)_1 = 0{,}242559$

$(III - III)_2 = 0{,}26\cancel{1670}$ 7765 $0{,}006095$

$(III - III)_3 = 0{,}00377294$

$(III - III)_4 = 0{,}083228$

$\cancel{0{,}006095}$

$\cancel{0{,}6232619} + \cancel{\cos\varphi .\ 0{,}012190}$

$F\,67\tfrac{1}{2} = \cancel{0{,}6\ldots}$

$\cancel{0{,}6\ldots}$

$F\,67\tfrac{1}{2} = 0{,}619569$

Nagy cukor a gummiban

Febr. 19 reggel 8h.

I állás ~~vez~~ skálatáv 1802 m.m. + 180

álló 250,0 mozgó 237,0.

elvittem II állásba.

II állás skálatáv 1800 m.m. +

Febr. 20

d.e. 11h. 15 álló 250 mozgó 258,1

elfogyott 1 kg. elkészült 11h. 40.

I skálatáv 1802 m.m.

Febr. 20 este 8h. 235,2

elvittem II állásba skálatáv 180,0

21-kén reggel 9h. 20. II állás 259,2 300

elfogyott III állásba [illegible] 10

csökkent 9h. 45'

III állás skálatáv 1805

Febr. 21 este 7h. álló 250 mozgó 216,25.

elfogyott II állásba.

Febr. 22 reggel 9h. 258,0

elfogyott I állásba 9h-kor

I állás skálatáv 1805

Febr. 22 este 8h. 231,8

elfogyott II állásba elkészült 8h 10'kor

skálatáv 1805

9 h.

23 ikán reggel II 256,4

[illegible] III állásban. [illegible] 9 kor

III állás [illegible] 180,5

24 dikén reggel 11 kor 210,8

este 8 kor 210,0

25 dikén reggel 8 kor 209,2

d.u. 4 kor 208,0

26 dikán regg. 8 kor 207,6

27 dikén regg. 8 kor 206,0

28 regg 9 kor 203,6

Marcz. 5 délben 1 kor 195,0

Márcz 6 dikán este 8 h. 30 kor 194,0

7 ikén d.u. 1 h. 30 191,0

8 dikán r. 8 h. 30 191,1

" este 9 h. 20 189,5

9 ikén r. 8 h. 30 190,0 — ?

10 ikén este 7 óra [illegible] újra [illegible].

11 ikén d.e. 1 kor. 167,2

11 dikén 1 órakor újra [illegible] és [illegible].

11 dikén este 8 167 [illegible] a [illegible] [illegible] [illegible]

Március 12 d.e. 8 kor. 233,3

este 8 h. 30 kor 232,7

$$\frac{\partial g}{\partial s} = \frac{\partial g}{\partial x}\frac{\partial x}{\partial s} + \frac{\partial g}{\partial y}\frac{\partial y}{ds}$$

$x^2 + y^2 = s^2$

$\frac{\partial x}{\partial s} + \frac{\partial y}{\partial s} = 1$

$x\,dx = s\,ds$

$$\frac{\partial S}{ds} = \frac{\partial S}{\partial x}\cos\alpha + \frac{\partial S}{\partial y}\sin\alpha.$$

$$\left(\frac{\partial S}{\partial s}\right)^2 = \left(\frac{\partial S}{\partial x}\right)^2 + \left(\frac{\partial S}{\partial y}\right)^2$$

$\frac{1}{\rho^2} =$

$$\frac{dg}{dx} = \frac{dg}{ds}\frac{ds}{dx} = \frac{dg}{ds}\frac{x}{s}$$

$$\frac{dg}{dy} = \frac{dg}{ds}\frac{y}{s}.$$

$$\frac{dg}{\partial x} \quad \frac{dg}{ds}\sqrt{\left(\frac{d}{dx}\right)^2 + \left(\frac{d}{dy}\right)^2}$$

$\frac{dg}{}$ $\frac{\partial g}{\partial x}$ $\frac{\partial g}{\partial y}.$

$\alpha.$

$\frac{ds}{dx}$ $\frac{dg}{ds}$ $\frac{dg}{dy}$

$\frac{dg}{dx}\xi =$

$h_s.$ $\quad \frac{dg}{dx}\xi + \frac{dg}{dy}\eta$

$\frac{dg}{ds}\cdot\frac{x}{s}$

$$\frac{dg}{ds}\sigma = \frac{dg}{dx}\sigma\cos\alpha + \frac{dg}{dy}\sigma\sin\alpha,$$

$s^2 = x^2 + y^2$

ez maximum

$\frac{dx}{ds}$

$$\frac{dg}{dx}\sin\alpha + \frac{dg}{dy}\cos\alpha = 0.$$

$$\operatorname{tg}\alpha = \frac{\frac{dg}{dy}}{\frac{dg}{dx}}$$

$\frac{\sin\alpha}{r}$ $\quad \frac{dg}{ds} =$

$\cos$

$$\left(\frac{dg}{ds}\right)^2 = \left(\frac{dg}{dx}\right)^2\cos^2\alpha + \left(\frac{dg}{dy}\right)^2\sin^2\alpha.$$

$$\left(\frac{dg}{dx}\right)^2\sin^2\alpha = \frac{d^2g}{dy^2}\cos^2\alpha$$

$\int \frac{\sin\alpha}{r^4}$ $\int \frac{\cos\alpha}{r^4}$

$z = z_0 + \frac{\partial z}{\partial x}\xi +$

$-\frac{\partial f}{\partial x}\cos\alpha - \frac{\partial f}{\partial y}\sin\alpha$

$g = g_0 + \frac{dg}{dx}\xi + \frac{dg}{dy}\eta$

$\frac{\partial f}{\partial s}\sigma = \frac{\partial f}{\partial x}\xi + \frac{\partial f}{\partial y}\eta$

$\xi = s\cos\alpha \quad \eta = s\sin\alpha.$

$\frac{\partial f}{\partial s} = \frac{\partial f}{\partial x}\cos\alpha + \frac{\partial f}{\partial y}\sin\alpha.$

$dx = ds\cos\alpha.$

$x = s\sin\alpha.$

$-\frac{\partial f}{\partial x}\sin\alpha + \frac{\partial f}{\partial y}\cos\alpha = 0$

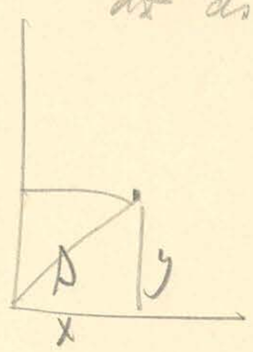
$\frac{dg}{ds}\sigma$

$\frac{dg}{dx}\frac{dx}{ds} + \frac{dg}{dy}\frac{dy}{ds}.$

$\left(\frac{\partial f}{\partial s}\right)^2 = \left(\frac{\partial f}{\partial x}\right)^2 + \left(\frac{\partial f}{\partial y}\right)^2$

$s^2 = x^2 + y^2$

$\frac{\partial X}{\partial x}\xi +$



$\frac{df}{ds}.$

$\frac{\partial X}{\partial y}$

$\frac{\partial f}{\partial x} = \sqrt{\left(\frac{\partial f}{\partial x}\right)^2 + \left(\frac{\partial f}{\partial y}\right)^2} \cdot \frac{\xi}{\sqrt{\xi^2+\eta^2}} = \frac{\partial f}{\partial s}\cos\alpha . = \frac{\partial f}{\partial s}\frac{x}{s}$

$\frac{\partial f}{\partial x} = \frac{\partial f}{\partial s}\cdot\frac{x}{s}.$

$\frac{\partial f}{\partial y} = \frac{\partial f}{\partial s}\cos\beta = \frac{\partial f}{\partial s}\frac{y}{s}$

$\frac{\partial f}{\partial y} = \frac{\partial f}{\partial s}\frac{y}{s}.$

$\frac{\partial f}{\partial z} = \frac{\partial f}{\partial s}\cos\gamma = \frac{\partial f}{\partial s}\frac{z}{s}$. $\frac{\partial f}{\partial x} = \frac{\partial f}{\partial s}\frac{x}{s}.$

$$X = X_0 + \frac{\partial X}{\partial x}\xi + \frac{\partial X}{\partial y}\eta + \frac{\partial X}{\partial z}\zeta$$

$$Y = Y_0 + \frac{\partial Y}{\partial x}\xi + \frac{\partial Y}{\partial y}\eta + \frac{\partial Y}{\partial z}\zeta$$

$$Z = Z_0 + \frac{\partial Z}{\partial x}\xi + \frac{\partial Z}{\partial y}\eta + \frac{\partial Z}{\partial z}\zeta.$$

9 [illegible]:

ezek között [illegible] potentiál van.

$$\frac{\partial X}{\partial y} = \frac{\partial Y}{\partial x} \qquad \frac{\partial Y}{\partial z} = \frac{\partial Z}{\partial y} \qquad \frac{\partial Z}{\partial x} = \frac{\partial X}{\partial z}$$

és Laplace [illegible] 4

marad 5.

Ha az [illegible] az [illegible] kezdőpontjában [illegible] feladatra az X y [illegible] akkor.

ξ.. $X_0 = 0 \quad Y_0 = 0 \quad Z = Z_0 = g_0$

g_0 a nehézség a kezdőpontban.

[illegible]

$$\frac{\partial X}{\partial x} = -\frac{g}{\rho_\xi} \qquad \frac{\partial Y}{\partial y} = -\frac{g}{\rho_\xi'}. \qquad \text{és} \qquad \frac{\partial X}{\partial y} + \frac{\partial Y}{\partial x} = 0.$$

$$\frac{dZ}{dz} = \frac{dy}{dz} = [illegible] - g\left(\frac{1}{\rho_\xi} + \frac{1}{\rho_\xi'}\right)$$

A [illegible] ha [illegible]

$$\frac{d\beta}{\partial x}\xi = -\xi(\xi \cdot \xi) [illegible] \quad \text{és} \quad \frac{\partial X}{\partial y} = g$$

Ha a [illegible] a [illegible] a [illegible] és [illegible] az [illegible] [illegible] $\frac{\partial X}{\partial y} = 0$.

[illegible] 4.

Quadratikus oszlopra vonatkozó 98 Dec. 18ikáig kiszámított összes adatok.

$a = b = 1 \quad c = 2$

$l = 1.$

1) Potential. $\varphi_0 = 0 \quad V_0 = 4f\sigma l^2\, 2{,}854519$) 0,040199

$\varphi = 22\tfrac{1}{2}^\circ \quad V_{\varphi 22\frac{1}{2}} = 4f\sigma l^2\, 2{,}894718$) 0,043195

$\varphi = 45^\circ \quad V_{45} = 4f\sigma l^2\, 2{,}937913$

2) Forgási momentum $\varphi = 22\tfrac{1}{2}$ $F_{22\frac{1}{2}} = 0{,}165995$

végtelen kicsiny lengések $\varphi = 0°$ körül $\left(\frac{\partial F}{\partial \varphi}\right)_0 = 4f\sigma l^2\, 0{,}624405\, \vartheta$

3) " " " $\varphi = 45°$ körül $\left(\frac{\partial F}{\partial \varphi}\right)_{45} = -4f\sigma l^2\, 0{,}715603\, \vartheta$

4) véges kicsiny lengések $\varphi = 0$ körül $\frac{\partial F}{\partial \varphi} = +4f\sigma l^2 (0{,}6244034 - \cancel{1{,}13\ldots}\ 1{,}393217\, \varphi^3)$

Végtelen kicsiny lengések $\varphi = 0$ körül

$l=0$	0	
$l=0{,}3$	0,060880	0,0561 9645
$l=0{,}6$	0,237561	0,2247858
$l=0{,}8$	0,414779	0,392619
$l=0{,}9$	0,516420	0,505768
$l=1{,}0$	0,624405	

$$\alpha = \quad \frac{1}{4f\sigma l^2} F = \alpha_4 \sin 4\varphi + \alpha_8 \sin 8\varphi + \alpha_{12} \sin 12\varphi + \alpha_{16} \sin 16\varphi + \alpha_{20} \sin 20\varphi + \ldots$$

$$\frac{1}{4f\sigma l^2} V = -\frac{\alpha_4}{4}\cos 4\varphi - \frac{\alpha_8}{8}\cos 8\varphi - \frac{\alpha_{12}}{12}\cos 12\varphi - \frac{\alpha_{16}}{16}\cos 16\varphi - \frac{\alpha_{20}}{20}\cos 20\varphi - \ldots$$

$$\frac{1}{4f\sigma l^2}\left(\frac{\partial V}{\partial \varphi}\right) = 4\alpha_4 \cos 4\varphi + 8\alpha_8 \cos 8\varphi + 12\alpha_{12}\cos 12\varphi + 16\alpha_{16}\cos 16\varphi + 20\alpha_{20}\cos 20\varphi + \ldots$$

a 98 Dennett-29 [illegible] négy nevező egyenletét.

$$\frac{1}{4f\sigma\lambda^2}\left(\frac{\partial F}{\partial \varphi}\right)_0 = 4\alpha_4 + 8\alpha_8 + 12\alpha_{12} = 0{,}624403$$

$$\frac{1}{4f\sigma\lambda^2}\left(\frac{\partial F}{\partial \varphi}\right)_{45} = -4\alpha_4 + 8\alpha_8 - 12\alpha_{12} = \cancel{0}0{,}722113$$

$$\frac{1}{4f\sigma\lambda^2} F_{22\frac{1}{2}} = \alpha_4 \qquad - \alpha_{12} = 0{,}165997$$

$$F = 4f\sigma\lambda^2\left(0{,}1665764 \sin 4\varphi - 0{,}0061069 \sin 8\varphi + 0{,}0005794 \sin 12\varphi\right)$$

ez ad $\varphi = 11\frac{1}{4}$ $F_{11\frac{1}{4}} = 0{,}112090$

Átmeneti négyes formula a feltételhez hozzávéve α_{16}-ot.

$$F_{11\frac{1}{4}} = \frac{1}{\sqrt{2}}\alpha_4 + \alpha_8 + \frac{1}{\sqrt{2}}\alpha_{12} = 0{,}1118161$$

marad α_4 és α_{12} $\qquad \alpha_8 = -0{,}0063809$

$$16\alpha_8 + 32\alpha_{16} = -0{,}097710$$

$$\alpha_{16} = +0{,}00013701$$

Ötös formula:

$$\frac{1}{4/\sigma\lambda^2}\left(\frac{\partial F}{\partial \varphi}\right)_0 = 4\alpha_4 + 8\alpha_8 + 12\alpha_{12} + 16\alpha_{16} + 20\alpha_{20} = 0{,}624403$$

$$\frac{1}{4/\sigma\lambda^2}\left(\frac{\partial F}{\partial \varphi}\right)_{45} = -4\alpha_4 + 8\alpha_8 - 12\alpha_{12} + 16\alpha_{16} - 20\alpha_{20} = -0{,}722113$$

$$\frac{1}{4/\sigma\lambda^2} F_{22\frac{1}{2}} = \alpha_4 \qquad - \alpha_{12} \qquad + \alpha_{20} = 0{,}165997$$

$$\frac{1}{4/\sigma\lambda^2} F_{11\frac{1}{4}} = \frac{1}{\sqrt{2}}\alpha_4 + \alpha_8 + \frac{1}{\sqrt{2}}\alpha_{12} + 0 - \frac{1}{\sqrt{2}}\alpha_{20} = 0{,}111816$$

$$\frac{1}{4/\sigma\lambda^2} F_{33\frac{3}{4}} = \frac{1}{\sqrt{2}}\alpha_4 - \alpha_8 + \frac{1}{\sqrt{2}}\alpha_{12} + 0 - \frac{1}{\sqrt{2}}\alpha_{20} = 0{,}110664$$

$$\alpha_8 = +0{,}000576$$

$$\alpha_{16} = -0{,}0033414$$

$$8\alpha_4 + 24\alpha_{12} + 40\alpha_{20} = 1{,}346516$$

$$\alpha_4 - \alpha_{12} + \alpha_{20} = 0{,}165997$$

$$\sqrt{2}\alpha_4 + \sqrt{2}\alpha_{12} - \sqrt{2}\alpha_{20} = 0{,}222480$$

$$\alpha_4 = 0{,}1610571$$

$$\alpha_{20} = 0{,}0024596$$

$$\alpha_{11} = -0{,}0018804$$

Ötös formula [illegible]

$$4\alpha_4 + 8\alpha_8 + 12\alpha_{12} + 16\alpha_{16} + 20\alpha_{20} = 0{,}624403$$

$$-4\alpha_4 + 8\alpha_8 - 12\alpha_{12} + 16\alpha_{16} - 20\alpha_{20} = -0{,}722113$$

$$\alpha_4 \qquad - \alpha_{12} \qquad + \alpha_{20} = 0{,}165997$$

$$\frac{1}{\sqrt{2}}\alpha_4 + \alpha_8 + \frac{1}{\sqrt{2}}\alpha_{12} + 0 \quad - \frac{1}{\sqrt{2}}\alpha_{20} = 0{,}1122140$$

$$\frac{1}{\sqrt{2}}\alpha_4 - \alpha_8 + \frac{1}{\sqrt{2}}\alpha_{12} + 0 \quad - \frac{1}{\sqrt{2}}\alpha_{20} = 0{,}1241140$$

c/.

$$\frac{1}{4f\sigma l^2}V_0 = -\frac{\alpha_4}{4} - \frac{\alpha_8}{8} - \frac{\alpha_{12}}{12} - \frac{\alpha_{16}}{16} - \frac{\alpha_{20}}{20}$$

$$\frac{1}{4f\sigma l^2}V_{22\frac{1}{2}} = \quad + \frac{\alpha_8}{8} \quad - \frac{\alpha_{16}}{16} \quad + \left(\frac{\alpha_{24}}{24}\right)$$

$$\frac{1}{4f\sigma l^2}V_{45} = + \frac{\alpha_4}{4} - \frac{\alpha_8}{8} + \frac{\alpha_{12}}{12} - \frac{\alpha_{16}}{16} + \frac{\alpha_{20}}{20}.$$

1) $\frac{1}{4f\sigma l^2}\left(V_{22\frac{1}{2}} - V_0\right) = + \frac{\alpha_4}{4} + \frac{\alpha_8}{4} + \frac{\alpha_{12}}{12} + 0 + \frac{\alpha_{20}}{20} = 0{,}040199$

2) $\frac{1}{4f\sigma l^2}\left(V_{45} - V_{22,5}\right) = + \frac{\alpha_4}{4} - \frac{\alpha_8}{4} + \frac{\alpha_{12}}{12} + 0 + \frac{\alpha_{20}}{20} = 0{,}043195$

(1,2) $\frac{1}{4f\sigma l^2}\left(V_{45} - V_0\right) = \frac{\alpha_4}{2} + \frac{\alpha_{12}}{6} + \frac{\alpha_{20}}{10} = 0{,}083394$

3) $\frac{1}{4f\sigma l^2}\left(\frac{\partial F}{\partial \varphi}\right)_0 = 4\alpha_4 + 8\alpha_8 + 12\alpha_{12} + 16\alpha_{16} + 20\alpha_{20} = 0{,}624405$

4) $\frac{1}{4f\sigma l^2}\left(\frac{\partial F}{\partial \varphi}\right)_{45} = -4\alpha_4 + 8\alpha_8 - 12\alpha_{12} + 16\alpha_{16} - 20\alpha_{20} = -0{,}715603$

5) $\frac{1}{4f\sigma l^2}F_{22\frac{1}{2}} = \alpha_4 - \alpha_{12} + \alpha_{20} = 0{,}165995$

$$F = 4f\sigma l^2\left\{0{,}166644\sin 4\varphi - 0{,}005992\sin 8\varphi + 0{,}000512_8\sin 12\varphi + 0{,}000146\sin 16\varphi - 0{,}000136_3\sin 20\varphi\right\}$$

ebből [illegible]

$$F = 4f\sigma l^2\left(0{,}624405\,\varphi - 1{,}331841\,\varphi^3\right)$$

[illegible] $\left(\frac{\partial F}{\partial \varphi}\right)_0 = \left\{\left(a\lambda^2 + b\lambda^4 + c\lambda^6\right) + 8\alpha_8\lambda^6 + 12\alpha_{12}\lambda^{10} + 16\alpha_{16}\lambda^{14} + 20\alpha_{20}\lambda^{18}\right)$

e miatt

$\lambda = 1$-re $\quad a + b + c = 0{,}666577.$

$\lambda = 0{,}3$-re $\quad a\,0{,}09 + b \cdot 0{,}0081 + c\,0{,}000729 = 0{,}060915$

$\lambda = 0{,}8$-ra $\quad a \cdot 0{,}64 + b \cdot 0{,}4096 + c\,0{,}262144 = 0{,}426631$

ezekből $\quad a = 0{,}6796765 \quad b = -0{,}03342014 \quad c = +0{,}0203206$

$4\alpha_4 = a\lambda^2 + b\lambda^4 + c\lambda^6.$

ebből $\lambda = 0{,}6$-ra $\left(\frac{\partial F}{\partial \varphi}\right)_0 = 0{,}239103.$

[illegible]

Interpolációs formula. l = 1 m. a = 1 b = 1 c = 2 1915 Novemb.

$$F = (+\sin 4\alpha \cdot 0{,}666216 - \sin 8\alpha\, 0{,}022063)\, p.$$

ebből

$F_{11^\circ 15'} = 0{,}449023\, p$ szigorú érték $= 0{,}448360\, p$

$F_{22^\circ 30'} = 0{,}666216\, p$ ″ ″ $= 0{,}663980\, p$

$\cancel{F_{45}} = ..$

$\left(\frac{\partial F}{\partial \alpha}\right)_0 = +2{,}488400$ szigorú érték $= 2{,}497620$

$\left(\frac{\partial F}{\partial \alpha}\right)_{45^\circ} = -2{,}841408$ ″ ″ $= -2{,}862412$

$$10{,}6568542\,\alpha_4 + 12{,}6568542\,\alpha_{12} - 20{,}6568542\,\alpha_{20} = 1{,}7819169$$

$$\alpha_4 + 1{,}1876727\,\alpha_{12} - 1{,}9383633\,\alpha_{20} = 0{,}1672085$$

$$\alpha_4 - \alpha_{12} + \alpha_{20} = 0{,}1659970$$

$$\alpha_4 + 3\alpha_{12} + 5\alpha_{20} = 0{,}1683145$$

0,0023175

$$2{,}1876727\,\alpha_{12} - 2{,}9383633\,\alpha_{20} = 0{,}0012115$$

$$\alpha_{12} - 1{,}3431458\,\alpha_{20} = 0{,}00055378$$

$$\alpha_{12} + \alpha_{20} = 0{,}00057938$$

$$2{,}3431458\,\alpha_{20} = +0{,}00002560$$

$$\alpha_{20} = +0{,}00001092\,6$$

57938

$$\alpha_{12} = +0{,}00056845$$

0,1659970
5685
0,1665655
109

$$\alpha_4 = 0{,}1665546$$

+ 0,8327730
39791
+ 0,8367521
7891688
0,0475833

$$\alpha_8 = -0{,}0059479$$

0,7890049
0001639
0,7891688

− 0,0061068 5
594791
0,0001589 4

$$\alpha_{16} = -0{,}0007947$$

10926
5463
1638 9

+ 0,1665546
0153482
0013658
+ 0,1832686
− 0527000
0,1305686
526693
1305 9,93

− 0,0475736
0051264
0,0527000

0,0475832
0050861
0526693

0,1665546
5685
0,1671231
109
0,1671122

0,11816618
59479
0,11221828 = $f_{11/4}$
4

~~Január 3.~~

$\alpha_4 + 2\alpha_8 + 3\alpha_{12} + 4\alpha_{16} + 5\alpha_{20} = 0,1561008$

$-\alpha_4 + 2\alpha_8 - 3\alpha_{12} + 4\alpha_{16} - 5\alpha_{20} = -0,1805282$

$\alpha_4 - \alpha_{12} + \alpha_{20} = 0,1659970$

$\alpha_4 + 3\alpha_{12} + 5\alpha_{20} = 0,1683145$

$\alpha_4 + \alpha_{12} - \alpha_{20} = 0,1671091$

$\alpha_8 = -0,0059500$

$\alpha_{16} = -0,00007843$

$\alpha_4 = 0,1665531$

$\alpha_{20} = 0,00001167$

$\alpha_{12} = 0,00056772$

α_{20} javítva.

~~1914~~

0,011900 7071,0678

0,336328

$4\alpha_8 + 8\alpha_{16} = -0,0244274$

$\alpha_8 + 2\alpha_{16} = -0,00610685$

595000

0,00015685

0,3366290

~~688~~

0,3331061

1665531

~~$4\alpha_{12} + 4\alpha_{20} =$ 148~~

$4\alpha_{12} + 4\alpha_{20} = 0,0023175$

$2\alpha_{12} + 2\alpha_{20} = 0,0011121$

$\alpha_{12} + \alpha_{20} = 0,00057938$

$\alpha_{12} - \alpha_{20} = 0,00055605$

1167

0,00056772

$2\alpha_{20} = 0,00002333$

0,1665531
0017032
0006584

0,1683147
122137

1561010

0,0119000
3137

122137

10,659398
0,981020
0,093360

11,733778
3,367649

8,366129

3,046400
0,321249

3367649

8,366129
93360

8,272769
1,378795

Vége hiánya 1,394355
3217

$$64\alpha_4 + 512\alpha_8 + 1728\alpha_{12} + 4096\alpha_{16} + 8000\alpha_{20} = 8{,}359302$$

$$\begin{cases} \alpha_4 + 8\alpha_8 + 27\alpha_{12} + 64\alpha_{16} + 125\alpha_{20} = 0{,}1305981 \\ \alpha_4 + 2\alpha_8 + 2\alpha_{12} + 4\alpha_{16} + 5\alpha_{20} = 0{,}1561008 \end{cases}$$

$$-\alpha_4 + 2\alpha_8 + 3\alpha_{12} + 4\alpha_{16} - 5\alpha_{20} = -0{,}1805282$$

$$\alpha_4 + 2\alpha_{12} + \alpha_{20} = 0{,}1683145$$

$$\alpha_4 + \alpha_{12} - \alpha_{20} = 0{,}1671091$$

$$\alpha_4 + 27\alpha_{12} + 125\alpha_{20} = 0{,}1832176.$$

$\alpha_8 = -0{,}0059950$

$\alpha_{16} = -0{,}00007842$

$\alpha_{20} = 0{,}0000004384$

$\alpha_{12} = 0{,}00059832$

$\alpha_4 = 0{,}1665152$

II

0,0476000
0,0050195
1305981
1832176

$$2\alpha_{12} + 2\alpha_{20} = 0{,}0012054$$

$$26\alpha_{12} + 126\alpha_{20} = 0{,}0161085$$

0,1669536
5983
0,1663553

$$\alpha_{12} + \alpha_{20} = 0{,}0006027$$

438
59832

$$\alpha_{12} + 4{,}8461538\alpha_{20} = 0{,}0006195615$$

0,0476000
0050195
0,0526195

$$3{,}8461538\alpha_{20} = 0{,}0000168615$$

1671091
44
0,1671135
5983
0,1665152

0,1665152
0,0161546
0,0005480
0,1832178
0526195
1305983

0,1665151
0000044
0,1665195
5983
22½ foly 1659212

Nagy pontos – Dec. 22ikén – Tangl – Harkányi – Sőtér

$$\frac{\partial F}{\partial \varphi_0} = -(2\alpha_2 + 4\alpha_4 + 6\alpha_6 + 8\alpha_8 + 10\alpha_{10} + 12\alpha_{12} + 14\alpha_{14}) = -1{,}600203$$

$$\left(\frac{\partial F}{\partial \varphi}\right)_{90} = -(-2\alpha_2 + 4\alpha_4 - 6\alpha_6 + 8\alpha_8 - 10\alpha_{10} + 12\alpha_{12} - 14\alpha_{14}) = +1{,}774195$$

$$F_{45} = -(\alpha_2 - \alpha_6 + \alpha_{10} - \alpha_{14}) = -0{,}847520$$

$$F_{22\frac{1}{2}} = -\left(\frac{1}{\sqrt{2}}\alpha_2 + \alpha_4 + \frac{1}{\sqrt{2}}\alpha_6 + 0 - \frac{1}{\sqrt{2}}\alpha_{10} - \alpha_{12} - \frac{1}{\sqrt{2}}\alpha_{14}\right) = -0{,}576245$$

$$F_{67\frac{1}{2}} = -\left(\frac{1}{\sqrt{2}}\alpha_2 - \alpha_4 + \frac{1}{\sqrt{2}}\alpha_6 + 0 - \frac{1}{\sqrt{2}}\alpha_{10} + \alpha_{12} - \frac{1}{\sqrt{2}}\alpha_{14}\right) = -0{,}619560 \; \underline{+9}$$

$$V_{45} - V_0 = +\frac{\alpha_2}{2} + \frac{\alpha_4}{2} + \frac{\alpha_6}{6} + 0 + \frac{\alpha_{10}}{10} + \frac{\alpha_{12}}{6} + \frac{\alpha_{14}}{14} = +0{,}412332$$

$$V_{90} - V_{45} = +\frac{\alpha_2}{2} - \frac{\alpha_4}{2} + \frac{\alpha_6}{6} + 0 + \frac{\alpha_{10}}{10} - \frac{\alpha_{12}}{6} + \frac{\alpha_{14}}{14} = +0{,}433796$$

<u>ezekből</u>

$$4\alpha_2 + 12\alpha_6 + 20\alpha_{10} + 28\alpha_{14} = 3{,}374398$$

$$\alpha_2 - \alpha_6 + \alpha_{10} - \alpha_{14} = 0{,}847520$$

$$\sqrt{2}\alpha_2 + \sqrt{2}\alpha_6 - \sqrt{2}\alpha_{10} - \sqrt{2}\alpha_{14} = 1{,}195805$$

$$\alpha_2 + \frac{\alpha_6}{3} + \frac{\alpha_{10}}{5} + \frac{\alpha_{14}}{7} = 0{,}846128$$

$$\alpha_2 + 3\alpha_6 + 5\alpha_{10} + 7\alpha_{14} = 0{,}84359950$$

$$\alpha_2 - \alpha_6 + \alpha_{10} - \alpha_{14} = 0{,}84752000$$

$\sqrt{2} = 1{,}41421356$

$$\alpha_2 + \alpha_6 - \alpha_{10} - \alpha_{14} = 0{,}84556180$$

$$\alpha_2 + \frac{\alpha_6}{3} + \frac{\alpha_{10}}{5} + \frac{\alpha_{14}}{7} = 0{,}84612800$$

$$4\alpha_6 + 4\alpha_{10} + 8\alpha_{14} = -0{,}00392050$$

$$2\alpha_6 - 2\alpha_{10} = -0{,}00195820$$

$$\frac{2}{3}\alpha_6 - \frac{6}{5}\alpha_{10} - \frac{8}{7}\alpha_{14} = -0{,}00056620$$

$$8\alpha_{10} + 8\alpha_{14} = -0{,}00000410$$

$$+\frac{8}{5}\alpha_{10} + \frac{24}{7}\alpha_{14} = -0{,}00025960$$

$\alpha_4 = -0{,}0215124$

$\alpha_8 = -0{,}0002262$

$\alpha_{12} = +0{,}0001451$

$\alpha_{10} = +0{,}000141007$

$\alpha_{14} = -0{,}000141520$

$\alpha_6 = -0{,}000838093$

$\alpha_2 = +0{,}846399380$

Új négyes formula [illegible] 23 [illegible]

$$-\frac{\partial F}{\partial \varphi_0} = (2\alpha_2 + 4\alpha_4 + 6\alpha_6 + 8\alpha_8) = 1{,}600203$$

$$-\left(\frac{\partial F}{\partial \varphi}\right)_{\frac{\pi}{2}} = -2\alpha_2 + 4\alpha_4 - 6\alpha_6 + 8\alpha_8 = -1{,}774195$$

$$-F_{22\frac{1}{2}} = \frac{1}{\sqrt{2}}\alpha_2 + \alpha_4 + \frac{1}{\sqrt{2}}\alpha_6 = 0{,}576245$$

$$-F_{67\frac{1}{2}} = \frac{1}{\sqrt{2}}\alpha_2 - \alpha_4 + \frac{1}{\sqrt{2}}\alpha_6 = 0{,}619565$$

$$\alpha_2 + 3\alpha_6 = 0{,}8435995$$

$$\sqrt{2}\alpha_2 + \sqrt{2}\alpha_6 = 1{,}195810$$

$$\alpha_2 + \alpha_6 = 0{,}8455653$$

$$F = -4p\sigma l^2(0{,}8465482 \sin 2\vartheta - 0{,}021660 \sin 4\vartheta - 0{,}0009829 \sin 6\vartheta - 0{,}0000445 \sin 8\vartheta)$$

ebből $F_{45} = 0{,}8475311$

Öttagú formula. Eötvös habilitáci[illegible] Tárgy

$$\frac{\partial F}{\partial \varphi_0} = -(2\alpha_2 + 4\alpha_4 + 6\alpha_6 + 8\alpha_8 + 10\alpha_{10}) = -1{,}600203$$

$$\left(\frac{\partial F}{\partial \varphi}\right)_{90} = -(-2\alpha_2 + 4\alpha_4 - 6\alpha_6 + 8\alpha_8 - 10\alpha_{10}) = +1{,}7741955$$

$$F_{22\frac{1}{2}} = -\left(\tfrac{1}{\sqrt{2}}\alpha_2 + \alpha_4 + \tfrac{1}{\sqrt{2}}\alpha_6 + 0 - \tfrac{1}{\sqrt{2}}\alpha_{10}\right) = -0{,}576245$$

$$F_{67\frac{1}{2}} = -\left(\tfrac{1}{\sqrt{2}}\alpha_2 - \alpha_4 + \tfrac{1}{\sqrt{2}}\alpha_6 + 0 - \tfrac{1}{\sqrt{2}}\alpha_{10}\right) = -0{,}619565$$

$$F_{45} = -(\alpha_2 - \alpha_6 + \alpha_{10}) = -0{,}847520$$

$$\alpha_2 + 3\alpha_6 + 5\alpha_{10} = 0{,}84359950$$

$$\alpha_2 - \alpha_6 + \alpha_{10} = 0{,}84752000$$

$$\alpha_2 + \alpha_6 - \alpha_{10} = 0{,}84556533$$

$$\alpha_6 + \alpha_{10} = -0{,}000980125$$

$$\alpha_6 - \alpha_{10} = -0{,}000977335$$

$$\alpha_6 = -0{,}00097873$$

$$\alpha_{10} = -0{,}000001395$$

$$\alpha_2 = 0{,}84654267.$$

$$\alpha_4 = 0{,}021660$$

$$\alpha_8 = -0{,}0000445$$

$$F = -4f\sigma l^2 \{0{,}84654267 \sin 2\vartheta - 0{,}021660 \sin 4\vartheta - 0{,}00097873 \sin 6\vartheta - 0{,}0000445 \sin 8\vartheta - 0{,}000001395 \sin 10\vartheta\}$$

ebből $V_{45} - V_0 = 0{,}412278$ direct mérésből $0{,}412332$

$V_{90} - V_{45} = 0{,}433938$ direct " $0{,}433796$

$V_{90} - V_0 = 0{,}846216$ direct $0{,}846128$

ebből egyes tiszta φ-re:

longitudinális $F = -4f\sigma l^2(1{,}6002034\varphi - 0{,}85842\varphi^3)$

transversalis $F = +4f\sigma l^2(1{,}7741954\varphi - 1{,}328009\varphi^3)$

$$\frac{T_{\text{régi}}}{\delta\omega l^2} = -3,386193 \sin 2\alpha + 0,086640 \sin 4\alpha + 0,003932 \sin 6\alpha + 0,000178 \sin 8\alpha.$$

$$\frac{\eta F}{\delta\omega l^2} = -3,386168 \sin 2\alpha + 0,086639 \sin 4\alpha + 0,003910 \sin 6\alpha + 0,000179 \sin 8\alpha$$

~~Ritz~~

$$\frac{T}{\delta\omega l^2} = -3,386171 \sin 2\alpha + 0,086639 \sin 4\alpha + 0,003914 \sin 6\alpha + 0,000178 \sin 8\alpha + 0,000006 \sin 10\alpha.$$

új formula.

$$\frac{T}{\delta\omega l^2} = -\left\{3,386168 \sin 2\alpha - 0,086639 \sin 4\alpha - 0,003910 \sin 6\alpha + 0,000179 \sin 8\alpha\right\}$$

	$\frac{\partial F}{\partial\alpha}$ szigorú	$\frac{\partial T}{\partial\alpha}$ új [illegible]
$\alpha = 0$	$-6,400812$	$-6,400888$
$\alpha = 90^\circ$	$+7,096780$	$+7,096864$

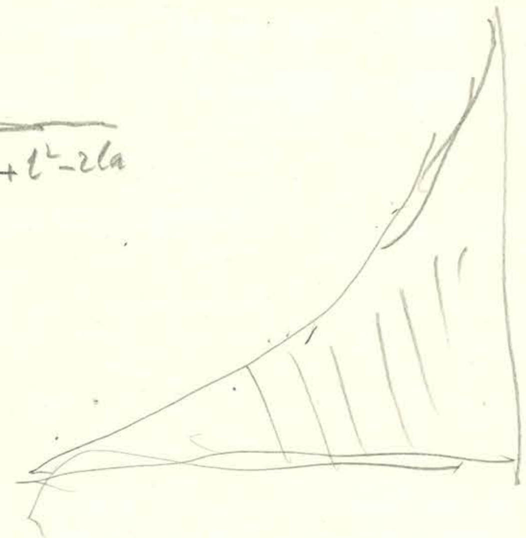
	F szigorú	F [illegible]
$\alpha = 22\frac{1}{2}$	$-2,304980$	$-2,304979$
$\alpha = 67\frac{1}{2}$	$+2,478260$	$+2,478257$
$\alpha = 45$	$-3,390080$	$-3,390078$

$$S^2 = a^2 + (b-l)^2 + c^2$$

$$\frac{1}{c^2(b-l)^2 + a^2S^2}\left[(l-b)S - \frac{a^2(b-l)}{S}\right] = -\frac{(b-l)(2a^2+(b-l)^2+c^2)}{c^2(b-l)^2+a^2S^2}$$

$$\frac{1}{c^2(b+l)^2 + a^2S^2}\left[(l+b)S + \frac{a^2(b+l)}{S}\right]$$

$$\frac{-b}{a^2+b^2+l^2-2la} \quad \frac{1}{\sqrt{a^2+b^2+c^2+l^2-2la}}$$



2,02022   0,305398   0,736574.

$$\frac{1,42134}{2,33484}$$

Ellipszis üreggel való maximum

Füreg nélküli test esetén
$v = abc$
$$\mathfrak{A} = \frac{V(x^2-1)\sqrt{(x^2+1)x^2+V^2}}{x((x^2+1)x^2+2V^2)}$$

$$A = \frac{M_l - M_t}{4 f \sigma 4} = \Big/_c^{\,b\,a} - \Big/_c^{\,a\,b}$$

$$\frac{V}{\cancel{8}} = 8abc - 2\pi b^2 c \qquad v = \frac{V}{8} \qquad \frac{a}{b} = x$$

$$b = 1$$

$$A = \operatorname{arctg} \mathfrak{A} \qquad \mathfrak{A} = \frac{V.(x^2-1)\sqrt{(x^2+1)(x-\frac{\pi}{4})^2+V^2}}{x\{(x^2+1)(x-\frac{\pi}{4})^2+2V^2\}} \quad F$$

$$h_a \ \cancel{b}\ b = 1 \qquad \cancel{V}\ V = \cancel{x}c - \frac{\pi}{4}c \qquad c = \frac{V}{x - \frac{\pi}{4}}$$

$V = 4$ re.

$x = 3$	$\mathfrak{A} = 1{,}061476.$
$x = 3{,}2$	$\mathfrak{A} = 1{,}069296$
$x = 3{,}4$	$\mathfrak{A} = 1{,}063843$
$x = 3{,}24$	$\mathfrak{A} = 1{,}069152$
$x = 3{,}18$	$\mathfrak{A} = 1{,}0691704$
$x = 3{,}22$	$\mathfrak{A} = 1{,}0692883$
$x = 3{,}21$	$\mathfrak{A} = 1{,}0693085$
$x = 3{,}208$	$\mathfrak{A} = 1{,}0693085$
$x = 3{,}205$	$\mathfrak{A} = 1{,}0693062$
$x = 3{,}20$	$\mathfrak{A} = 1{,}0692957$
$x = 3{,}209$	$\mathfrak{A} = 1{,}0693087.$

$A_{max} = \operatorname{arctg} \mathfrak{A} = 0{,}8188794$ $\qquad c = 1{,}6504361$

$a = 3{,}209 \quad b = 1 \quad c = 1{,}650436$ ~~[illegible]~~

	$\frac{M_l}{4f\sigma}$	$\frac{M_t}{4f\sigma}$	$\frac{M_t - M_l}{4f\sigma}$
$\lambda = 0$	$-1{,}637759$	$+1{,}637759$	$3{,}2\cancel{7}5518$
$\lambda = 1$	$-1{,}583628$	$+1{,}747472$	$3{,}331100$

[illegible] longitudinális $\quad \frac{F}{4f\sigma} = -1{,}583628\,\varphi + 0{,}8648265\,\varphi^2$

transzverzális $\quad \frac{F}{4f\sigma} = +1{,}7474724\,\varphi - 1{,}3054539\,\varphi^3$ probléma.

1898. Karácsonyi próba. $\quad \varrho_1^2 = (a-l)^2 + b^2 + c^2$

Véges hasáb kiterjedésre. $\quad \varrho_2^2 = (a+l)^2 + b^2 + c^2$

$$Y\cos\varphi - X\sin\varphi = -4f\sigma l^2 \Phi.\varphi + 4f\sigma l^2 \Bigg\{ \frac{1}{6}\Phi + \frac{1}{2}\left[\left|\begin{smallmatrix} b \\ a-l \\ c \end{smallmatrix}\right. + \left|\begin{smallmatrix} b \\ a+l \\ c \end{smallmatrix}\right. - \left|\begin{smallmatrix} a+l \\ b \\ c \end{smallmatrix}\right. - \left|\begin{smallmatrix} a-l \\ b \\ c \end{smallmatrix}\right. \right] -$$

$$- lbc\left(\frac{1}{\varrho_1\left((a-l)^2+b^2\right)} - \frac{1}{\varrho_2\left((a+l)^2+b^2\right)} \right) - \frac{l^2}{6}\frac{(a-l)\,bc}{\left(b^2\varrho_1^2+(a-l)^2c^2\right)\varrho_1}\left[-3 + 2\frac{(b^2+\varrho_1^2)^2}{b^2\varrho_1^2+(a-l)^2c^2} + \frac{b^2}{\varrho_1^2} \right] -$$

$$- \frac{l^2}{6}\frac{(a+l)\,bc}{\left(b^2\varrho_2^2+(a+l)^2c^2\right)\varrho_2}\left[-3 + 2\frac{(b^2+\varrho_2^2)^2}{b^2\varrho_2^2+(a+l)^2c^2} + \frac{b^2}{\varrho_2^2} \right] \Bigg\} \varphi^3$$

$$-\Phi = -\left|\begin{smallmatrix} b \\ a-l \\ c \end{smallmatrix}\right. - \left|\begin{smallmatrix} b \\ a+l \\ c \end{smallmatrix}\right. + \frac{a+l}{l}\left|\begin{smallmatrix} a+l \\ b \\ c \end{smallmatrix}\right. - \frac{a-l}{l}\left|\begin{smallmatrix} a-l \\ b \\ c \end{smallmatrix}\right. + \frac{b}{l}\left\{ \left\|\begin{smallmatrix} a+l \\ b \\ c \end{smallmatrix}\right. - \left\|\begin{smallmatrix} a-l \\ b \\ c \end{smallmatrix}\right. \right\} + \frac{c}{l}\left\{ \left|\!\left\|\begin{smallmatrix} a+l \\ b \\ c \end{smallmatrix}\right.\right. - \left|\!\left\|\begin{smallmatrix} a-l \\ b \\ c \end{smallmatrix}\right.\right. \right\}$$

$a=0 \quad b=1 \quad c=0 \quad l=\frac{1}{2}.$

$$[illegible] = -\int_3^{1}\Big|_{2,5} - \int_0^{1}\Big|_{3,5} + 7\int_3^{3,5}\Big|_{1} - 5\int_3^{3,5}\Big|_1 + 2\left\{ II\Big|_{1,\,3}^{3,5} - II\Big|_{1,\,3}^{2,5} \right\} + 6\left\{ III\Big|_{1,\,0}^{3,5} - III\Big|_{1,\,3}^{3,5} \right\}$$

$$[illegible] = -\int_3^{3}\Big|_{0,5} - \int_3^{3}\Big|_{1,5} + 3\int_3^{1,5}\Big|_3 - \int_3^{0,5}\Big|_3 + 6\left\{ II\Big|_{3,\,3}^{1,5} - II\Big|_{3,\,3}^{0,5} \right\} + 6\left\{ III\Big|_{0,\,0}^{1,5} - III\Big|_{0,\,0}^{0,5} \right\}$$

$\log 2{,}5 = 0{,}397940$

$\log 3{,}0 = 0{,}477121$

$\log 3{,}5 = 0{,}544068$

$\overline{2{,}5}^2 = 6{,}25 \quad \log\sqrt{1+\overline{2{,}5}^2+3^2} = 0{,}6054265 \quad \mathrm{Num} = 4{,}031129$

$\overline{3{,}0}^2 = 9{,}00 \quad \log\sqrt{1+\overline{3{,}5}^2+3^2} = 0{,}6736650 \quad \mathrm{Num} = 4{,}716990$

$\overline{3{,}5}^2 = 12{,}25$

$\log 0{,}5 = 0{,}698970-1$

$\log 1{,}5 = 0{,}176091$

$\log 3{,}0 = 0{,}477121$

$\overline{0{,}5}^2 = 0{,}25 \quad \log\sqrt{(\overline{0{,}5})^2+3^2+3^2} = 0{,}6306315 \quad \mathrm{Num} = 4{,}272008$

$\overline{1{,}5}^2 = 2{,}25 \quad \log\sqrt{\overline{1{,}5}^2+3^2+3^2} = 0{,}6532125 \quad \mathrm{Num} = 4{,}500000$

$\overline{3}^2 = 9$

$\int_0^{1}\Big|_{2,5} = 1{,}0776147$

$\int_0^{1}\Big|_{3,5} = 1{,}1485769$

$2{,}2261916$

$\int_0^{2,5}\Big|_1 = 0{,}1797520$

$\int_0^{3,5}\Big|_1 = 0{,}2893295$

$\int_0^{3}\Big|_{0,5} = \cancel{0{,}1160209}\ 0{,}1165104$

$\int_0^{3}\Big|_{1,5} = 0{,}3217515 \quad \cancel{0{,}4377724}$

$\int_0^{1,5}\Big|_3 = 0{,}9272953$

$\int_0^{0,5}\Big|_3 = \cancel{1{,}3258175}\ 1{,}3377755$

[illegible] $\begin{cases} II-II = 0{,}208421 \\ III-III = \cancel{0{,}037894}\ 0{,}0280935 \end{cases}$

[illegible] $\begin{cases} II-II = 0{,}067003 \\ III-III = 0{,}067003 \end{cases}$

[illegible]

$-2{,}2261916$
$-1{,}1466475$
$-3{,}6728391$
$1{,}902470$
$1{,}770349$

$3{,}672839$
$1{,}903667$
$1{,}769172$

$1{,}2582640$
$0{,}416842$
$\cancel{0{,}227964}$
$0{,}228561$
$\cancel{1{,}902470}$
$1{,}903667 \quad 1{,}769172$

$\Delta_l = \cancel{[illegible]}$

[illegible]

$-\cancel{0{,}4377724} \quad 0{,}4382619$
$\cancel{1{,}337775} \quad 1{,}3377755$
$\cancel{1{,}765[illegible]} \quad 1{,}7760374$
$1{,}775479$

$2{,}7818859$
804036
$3{,}585922$
$\cancel{[illegible]}$
$\cancel{[illegible]}$
$\cancel{1{,}810[illegible]4}$
$1{,}809885$

$\Delta_t = \cancel{1{,}810[illegible]}$

[illegible]

$\Delta_t - \Delta_l = 3{,}579057.$

$\Delta_l - \Delta_t = \cancel{3{,}5[illegible]} \ \cancel{3{,}5[illegible]}$

$\frac{1}{6} 64 \cdot 0,166071 - \frac{1}{6} 512 \; 0,005699 + \frac{1}{6} 1728 \cdot 0,0002765$

10,649774
0,650592

11295366
2,917588

144
12
288
144
1728

6 | 8,377478 | 1396246
23

Végső hiány $h=3$ $s=\cancel{7}$ $n=3$ $l=1$ re.

longitudinalis $\Phi = 1{,}706455$ $\frac{1}{2}\left[\left|{}^{b}_{a-1} + \right| - \left| - \right|\right] = 0{,}827\,\cancel{2875}\,4395$

$s_1 = 0{,}1257479$
$0{,}0324531$
$s_2 = \cancel{0{,}0805581}$

$s_3 = 0{,}0129550$
$\cancel{0{,}2192630}$
$0{,}1711560$

$\cancel{0{,}2844421}$
$0{,}2844092$
8273895
$1{,}1117987$
$\cancel{2192630}$
$\cancel{0{,}8924251}$

$1{,}1117987$
$0{,}1711560$
$\cancel{0{,}9406427}$
$0{,}9406927$

$\cancel{F = -4\sigma l^2(1{,}706455\,\varphi - 0{,}8924251\,\varphi^3)}$

$$F = -4\sigma l^2(1{,}706455\,\varphi - 0{,}9406927\,\varphi^3)$$

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transversalis $\Phi = -1{,}869561$ $\frac{1}{2}\left[| + | - | - |\right] = -0{,}966212$

$s_1 = 0{,}08810289$

$s_2 = 0$

$s_3 = 0{,}01526892.$

$-0{,}3115935$
966212
881029
152689
$1{,}3812773$

$$F = 4\sigma l^2(1{,}869561\,\varphi - 1{,}3812773\,\varphi^3)$$

$1{,}706455$ $0{,}9406927$
4405846 $2{,}3219700$

érintő $F = 4\sigma l^2(\alpha_2 \sin 2\vartheta + \alpha_4 \sin 4\vartheta + \alpha_6 \sin 6\vartheta + \alpha_8 \sin 8\vartheta)$

$0{,}163106 = 8\alpha_4 + 16\alpha_8$
$\cancel{0{,}4888902}$
$0{,}488892 = \frac{64}{3}\alpha_4 + \frac{512}{3}\alpha_8$

$-3{,}576016 = 4\alpha_2 + 12\alpha_6$

$-2{,}273742 = \frac{8}{3}\alpha_2 + 72\alpha_6$

$\alpha_2 = -0{,}89691\cancel{45}\,21$

$\alpha_4 = \cancel{0{,}0202988}\ 0{,}02030021$

$\alpha_6 = \cancel{0{,}00096954}\ 0{,}000\cancel{97017}\,96927$

$\alpha_8 = 0{,}0000440\cancel{3}$

$0{,}163106 = 8\alpha_4 + 16\alpha_8$

$0{,}440\,\cancel{635}\,585$ $\cancel{0{,}4406774} = \frac{64}{3}\alpha_4 + \frac{512}{3}\alpha_8$

$-3{,}576016 = 4\alpha_2 + 12\alpha_6$

$-2{,}321970$ $\cancel{-2{,}321960} = \frac{8}{3}\alpha_2 + 72\alpha_6$

$$F = -4\sigma l^2(0{,}8969121\sin 2\vartheta - 0{,}0203002\sin 4\vartheta - 0{,}0009694\sin 6\vartheta - 0{,}00004403\sin 8\vartheta)$$

ebből $F_{45} = -4\sigma l^2\, 0{,}897882$ mérési $F_{45} = 0{,}897848$

Mélakná 78 cm. — Bem Cum.

II. −7,0 / −63,0 / −11,9 } −36,3

511 : 56 = 0,912
511 : 1912 = 26,7
13880 — 36,3
263

II–III (Mélakná 78 cm)

~~+148~~ +115,6 / −156,0 / +92,5 } −26,3

248,5 : 2716 = 0,915
2485 : 1915 = 129,7

III. −22,5 / −32,5 / −23,2 } −27,7 (78 cm)

III–IV. (78 cm. Mélakná)

+180,0 / −169,9 / +149,5 } −3,0

319,4 : 3499 = 0,913
3194 : 1913 = 166,9

IV. +200,0 / −125,3 / +171,3 } +29,9

296,6 : 3253 = 0,911
2966 : 1911 = 155,2 — 125,3 — 29,9

IV–I. +36,0 / −7,0 / +32,5 } +13,6

395 : 43 = 0,919
395 : 1919 = 20,5

I. +124,8 / −165,0 / +100,9 } −26,3

265,9 : 2898 = 0,917
2659 : 1917 = 138,7 — 165 — 26,3

I–II. +55,0 / −138,0 / +38,0 } −46,0

176 : 193 = 0,912
1760 : 1912 = 92,0 — 138 — 46

II. +116,6 / −172,0 / +91,0 } −34,4

263 : 288,6 = 0,911
263 : 1911 = 137,6 — 172 — 34,4