

PRODUCTO DEL ÍNDICE LOGARÍTMICO DE 1 CENT Δ

$$\log(100)^{(1 / 1200)} = 1.00057778951 \text{ [PIL]}$$

Producto del índice logarítmico de 1 Hz (sistema de J. Sauveur)
1200 / 4 = 300

$$\log(100)^{(1 / 300)} = 1.00231316184 \text{ [PIL]}$$

$$1.00231316184 * 300 = 300.693948552 \text{ [301 savarts]}$$

SEMITONO TEMPERADO (SISTEMA DE J. SAUVEUR)

$$\log(100)^{(25 / 300)} = 1.05946309436 \text{ [PIL]}$$

TONO TEMPERADO (SISTEMA DE J. SAUVEUR)

$$\log(100)^{(50 / 300)} = 1.12246204831 \text{ [PIL]}$$

CONSTANTE SAUVEUR [K^s]

$$\log(2) = 0.30102999566 \text{ PIL}$$

OCTAVA

$$\log(100)^{(300 / 300)} = 2 \text{ [PIL]}$$

Escala de 300 heptaméridas ~300 frecuencias Hz

$$\log(100)^{(300 / 300)} * 261.62 = 523.24 \text{ Hz 8va}$$

Escala de heptaméridas dividida en 24 términos

$$\log(100)^{((300 / 24) / 300)} = 1.02930223664 \text{ [PIL]}$$

$$\log(100)^{((300 / 24) / 300)} * 261.62 = C4 + 1/4 \sim 269.286051151 \text{ Hz}$$

2 EJEMPLOS DE PIL FRECUENCIAL

$$C4 \log(261.62) = 2.41767094133 \text{ [PIL]}$$

[le tyran ut](#)

$$261.62 * \log(2) = 78.7554674656 \text{ Hz}$$

$$A4 \log(440) = 2.64345267649 \text{ [PIL]}$$

$$440 * \log(2) = 132.453198092 \text{ Hz}$$

Algunos ejercicios

Para los cuartos u otras magnitudes de recorrido [Octava o [Equisavas](#)]

$$\log(100) \wedge (((((1200 / 24) * 24 / 1200) * 1200) / 1200)) * 261.62$$

(log(100)^{(((1200 / 24) * 24) / 1200) * 1200) / 1200) * 261.62 =}

523.24

Rad	Deg	x!	()	%	AC
Inv	sin	ln	7	8	9	÷
π	cos	log	4	5	6	×
e	tan	√	1	2	3	-
Ans	EXP	x ^y	0	.	=	+

Recordatorio : $\log(100) \wedge (((((1200 / 24) * 24 / 1200) * 1200) / 1200)) = \text{PIL } 2 (8^{\text{va}})$

Recursividad

1200 ↔ 1492

$$\log(100) \wedge (((((1200 / 24) * 24 / 1200) * 1492) / 1200)) * 261.62$$

(log(100)^{(((1200 / 24) * 24) / 1200) * 1492) / 1200) * 261.62 =}

619.37200141

Rad	Deg	x!	()	%	AC
Inv	sin	ln	7	8	9	÷
π	cos	log	4	5	6	×
e	tan	√	1	2	3	-
Ans	EXP	x ^y	0	.	=	+

$$\log(100) \wedge (((((1200 / 24) * 24 / 1200) * 1492) / 1200)) = \text{PIL } 2.36744897718$$

Retorno a la escala temperada

$$\log(100) \wedge (((((1200 / 14.92) * 1 / 1200) * 1492) / 1200)) = 1.05946309436 \text{ PIL}$$

$$1.05946309436 * 261.62 = 277.176734746 \text{ C\#}^4$$

Logaritmo frecuencial

$$\log(261.62) \wedge \left(\frac{((1200 / 24) * 24 / 1200) * 1492}{1200} \right) * 261.62$$

The screenshot shows a scientific calculator interface. The display shows the formula $(\log(261.62)^{\frac{((1200 / 24) * 24 / 1200) * 1492}{1200}}) * 261.62 =$ and the result **784.081935647**. The calculator keypad includes buttons for Rad, Deg, x!, (,), %, AC, Inv, sin, ln, 7, 8, 9, ÷, π, cos, log, 4, 5, 6, ×, e, tan, √, 1, 2, 3, −, Ans, EXP, x^y, 0, ., =, and +.

$$\log(261.62) \wedge \left(\frac{((1200 / 24) * 24 / 1200) * 1492}{1200} \right) = \text{PIL } 2.99702597526$$

Logaritmo de la equisava 1492

$$\log(1492) \wedge \left(\frac{((1200 / 24) * 24 / 1200) * 1492}{1200} \right) * 261.62$$

The screenshot shows a scientific calculator interface. The display shows the formula $(\log(1492)^{\frac{((1200 / 24) * 24 / 1200) * 1492}{1200}}) * 261.62 =$ and the result **1099.75569114**. The calculator keypad includes buttons for Rad, Deg, x!, (,), %, AC, Inv, sin, ln, 7, 8, 9, ÷, π, cos, log, 4, 5, 6, ×, e, tan, √, 1, 2, 3, −, Ans, EXP, x^y, 0, ., =, and +.

$$\log(1492) \wedge \left(\frac{((1200 / 24) * 24 / 1200) * 1492}{1200} \right) = \text{PIL } 4.20363768496$$

Otros más

$$\log(100) \wedge \left(\frac{((1492 / 24) * 24 / 1200) * 1492}{1200} \right) = 2.91981664984 \text{ PIL}$$

$$\log(100) \wedge \left(\frac{((1492 / 24) * 24 / 1200) * 1492}{1200} \right) * 261.62 = 763.88243193 \text{ Hz}$$

Recorrido en cents Δ

$$1492 * \log(763.88243193 / 261.62) / \log(2) = 2306.44964444 \Delta \rightarrow \text{K } 23.06 \Delta$$

$$1200 * \log(763.88243193 / 261.62) / \log(2) = 1855.05333333 \Delta \rightarrow \text{K } 18.55 \Delta$$

Logaritmo de la 8va hibridada

$$\log(1200) \wedge (((((1492 / 24) * 24 / 1200) * 1492) / 1200)) * 261.62 = 1488.44278354 \text{ Hz}$$

$$\log(1200) \wedge (((((1492 / 24) * 24 / 1200) * 1492) / 1200)) = 5.68933102799 \text{ PIL}$$

Recorrido en cents Δ

$$1200 * \log(1488.44278354 / 261.62) / \log(2) = 3009.91083027 \Delta \rightarrow K 30.09 \Delta$$

Log de la Equisava 1492

$$\log(1492) \wedge (((((1492 / 24) * 24 / 1200) * 1492) / 1200)) * 261.62 = 1559.71423357 \text{ Hz}$$

$$\text{PIL } 5.96175458134 * 261.62 \text{ Hz}$$

$$\log(1492) \wedge (((((1492 / 24) * 24 / 1200) * 1492) / 1200)) = 5.96175458134 \text{ PIL}$$

Recorrido en cents Δ

$$1200 * \log(1559.71423357 / 261.62) / \log(2) = 3090.88438473 \Delta \rightarrow K 30.90 \Delta$$

Vertimiento primario de la equisava 1492

VERTIMIENTO SEMÁNTICO

$$\log(1492) = 3.17376882314 \text{ PIL}$$

PIL: acrónimo del producto índice logarítmico

$$\log(1492) * 261.62 = 830.321399509 \text{ Hz}$$

$$261.62 * 3.17376882314 = 830.32139951$$

$$1492 * \log(830.32139951 / 261.62) / \log(2) = 2485.96599308 \text{ (redondeado a } +2486)$$

$$1492 * \log(261.62 / 830.32139951) / \log(2) = -2485.96599308 \text{ (redondeado a } -2486)$$

$$-2486 < C4 > +2486$$

$$\text{PIL } 5.28812423876 | \log(1492) * \log(830.32139951 / 261.62) / \log(2)$$

Apuntes preliminares para el empleo de la fórmula:

$$\log(100) \wedge \left(\frac{\left(\frac{\left(\frac{\left(\frac{1200}{1200} \right) * 1200}{1200} \right) * 1200}{1200} \right) * 1200}{1200} \right)$$

$$\log(100) \wedge \left(\frac{\left(\frac{\left(\frac{\left(\frac{1200}{1200} \right) * 4}{1200} \right) * 1200}{1200} \right) * 1200}{1200} \right) = 1.00231316184 \text{ PIL correspondiente a } 1 \text{ Hz} \sim 4\Delta$$

$$1.00231316184 * 261.62 = 262.225169401 \text{ Hz [C4 + } 4\Delta]$$

Verificación:

sengpielaudio

Sistema Sauveur

$$\log(100) \wedge \left(\frac{\left(\frac{\left(\frac{300}{300} \right) * 1}{300} \right) * 300}{300} \right) = 1.00231316184$$

$$\log(100) \wedge \left(\frac{\left(\frac{\left(\frac{300}{300} \right) * 300}{300} \right) * 300}{300} \right) = 2$$

$$\log(100) \wedge \left(\frac{\left(\frac{\left(\frac{1200}{12} \right) * 1}{1200} \right) * 1200}{1200} \right) = 1.05946309436 \text{ PIL (100 } \Delta)$$

$$1.05946309436 * 261.62 = 277.176734746 \text{ C\#}^4$$

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$$\log(100) \wedge \left(\frac{\left(\frac{\left(\frac{1200}{12} \right) * 12}{1200} \right) * 1200}{1200} \right) = 2 \text{ PIL}$$

$$2 * 261.62 = 523.24 \text{ 8}^{\text{va}}$$

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$$\log(100) \wedge \left(\frac{\left(\frac{\left(\frac{1200}{12} \right) * 12}{1200} \right) * 1200}{-1200 * 5} \right) * 261.62 = 8.175625 \text{ Hz C}_{-1}$$

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Cambios de diapasón

$$\log(100) \wedge \left(\frac{\left(\frac{\left(\frac{1200}{12} \right) * (-9)}{1200} \right) * 1200}{1200} \right) * 440 = 261.625565301 \text{ Hz}$$

C4 diap. a 440]

$$\log(100) \wedge \left(\frac{\left(\frac{\left(\frac{1200}{12} \right) * (-9)}{1200} \right) * 1200}{1200} \right) * 432 = 256.868736841 \text{ Hz}$$

[C4 diap. a 432]

Logaritmo frecuencial

$$\log_2(2^{(((((1200 / 1200) * 1200) / 1200) * 1200) / 1200))}) = 0.30102999566 \text{ PIL}$$

Frecuencia substrato & constante operacional

$$0.30102999566 * 261.62 = 78.7554674646 \text{ Hz [D\#2 + 22 \Delta]}$$

Sea

$$\log_2(2^{(((((1200 / 1200) * 1200) / 1200) * 1200) / 1200))}) * 261.62 = 78.7554674656 \text{ Hz}$$

Recorrido descendente en cents

$$1200 * \log_2(78.75 / 261.62) = -2078.54520695 \Delta$$

Frecuencia antípoda infra-metatonal de C4 → 369.994 Hz [F#4]

Operaciones

$$\log(369.994) * 0.301 = 0.7730265991 \text{ PIL}$$

$$261.62 * 0.7730265991 = 202.239218857 \text{ Hz}$$

$$261.62 \text{ Hz} + 202.239218857 \text{ Hz} = 463.859218857 \text{ Hz}$$

Sea:

$$463.869219 \text{ Hz} - 261.62 \text{ Hz} = 202.249219 \text{ Constante Hz}$$

Elements	Note	Octave	Cents	Cents const.	Frequency in Hertz	Global index
0	C	4	0	0	261.62	10800
1	A	4	91	991	463.859219	11791

Harmonics Calculator

Harmonics Calculator

Fundamental frequency in Hz: X

Frequency constant in Hz:

Harmonic structure: X

Number of harmonics: X

Scale's element from: X

0

Calculate Harmonics

Legend

$$1200 * \log(463.859218857 / 261.62) / \log(2) = 991.457015805 \text{ cents } [\Delta]$$

$$463.859218857 / 261.62 = 1.7730265991 \text{ PIL}$$

General parameters

Origin frequency in Hz: X

Limit: X

Elements	Note	Octave	Cents	Cents const.	Frequency in Hertz	Global index
0	C	4	0	991	261.62	10800
1	A	4	91	991	463.859219	11791

Despliegue armónico infra-metatonal

Harmonics Calculator

Harmonics Calculator

Fundamental frequency in Hz
 X

Frequency constant in Hz

Harmonic structure
 X

Number of harmonics
 X

Scale's element from
 X

2

Calculate Harmonics

Elements	Note	Octave	Cents	Cents const.	Frequency in Hertz	Global index
0	C	4	0	0	261.62	10800
1	A	4	91	991	463.859219	11791
2	E	5	18	1618	666.098438	12418
3	G#	5	77	2077	868.337657	12877
4	C	6	39	2439	1070.576875	13239
5	D#	6	39	2739	1272.816094	13539
6	F	6	94	2994	1475.055313	13794
7	G#	6	17	3217	1677.294532	14017
8	Bb	6	14	3414	1879.533751	14214
9	B	6	91	3591	2081.77297	14391
10	C#	7	51	3751	2284.012189	14551
11	D	7	98	3898	2486.251407	14698

Una equisava infra-metatonal

$$\frac{\log(369.994) * 261.62}{\log(2)}$$

$$= 671.891092547 \text{ Hz}$$

$$\frac{1100 * \log(671.891092547 / 261.62)}{\log(2)}$$

$$= 1496.83002674 \text{ cents } [\Delta]$$

cents | Frequency ratio f_2/f_1

↓ calculate ↓ calculate

Frequency ratio f_2/f_1 | reset | cents

General parameters

Origin frequency in Hz X

Limit X

Elements	Note	Octave	Cents	Cents const.	Frequency in Hertz	Global index
0	C	4	0	1497	261.62	10800
1	D	5	97	1497	621.102362	12297

Proliferación

$$\frac{\log(1100) * \log(671.891092547 / 261.62)}{\log(2)}$$

$$= 4.13858899478 \text{ PIL}$$

General parameters

Origin frequency in Hz X

Limit X

Elements	Note	Octave	Cents	Cents const.	Frequency in Hertz	Global index
0	C	4	0	2459	261.62	10800
1	C	6	59	2459	1082.737653	13259

Fórmula sencilla para el cálculo de cualquier división infra-cromática de la 8^{va}
Ejemplo en cuartos de tono

$$\frac{\log(100)^{(1200 / 24 / 1200)}}{261.62} = 269.286051151 \text{ Hz } \mathbf{C4} + \mathbf{1/4 \text{ de ton}}$$

$$\mathbf{PIL} \frac{\log(100)^{(1200 / 24 / 1200)}}{261.62} = 1.02930223664$$

$$\frac{\log(100)^{(1200 / 24 * 2 / 1200)}}{261.62} = 277.176734746 \text{ Hz } \mathbf{C\# 4 \text{ ou}} + \mathbf{2/4 \text{ de tons}}$$

$$\mathbf{PIL} \frac{\log(100)^{(1200 / 24 * 2 / 1200)}}{261.62} = 1.05946309436$$

$$\frac{\log(100)^{(1200 / 24 * 24 / 1200)}}{261.62} = 523.24 \text{ Hz } \mathbf{[8^{va}]}$$

$$\mathbf{PIL} \frac{\log(100)^{(1200 / 24 * 24 / 1200)}}{261.62} = 2$$

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Y FINALMENTE, LA ESCALA LOGARÍTMICA DE FRECUENCIAS HERCIOS PARA EL USO
NORMATIVO EN LA CULTURA OCCIDENTAL

Recorrido de 300 hercios / equivalentes a las 300 heptaméridas de
Joseph Sauveur 1653-1716 / *fundador de la acústica moderna*

$$\frac{\log(100)^{(1 / 300)}}{261.62} = 1.00231316184 \mathbf{PIL} \text{ sea } \log(100)^{(1 / 300)} * 261.62 = 262.225169401 \sim \mathbf{1HZ}$$

$$\frac{\log(100)^{(300 / 300)}}{261.62} = 2 \mathbf{PIL} \text{ sea } \log(100)^{(300 / 300)} * 261.62 \text{ Hz } [\mathbf{C4}] = 523.24 \text{ Hz } [\mathbf{C5}]$$

Ejemplo en Do

Despliegue cromático.....

<u>0</u>		[C4]	
<u>25</u>	heptaméridas	[C# 4]	~ 100 cents [Δ]
<u>50</u>	idem...	[D4]	~ 200 cents [Δ]
<u>75</u>	idem...	[D# 4]	~ 300 cents [Δ]
<u>100</u>	↓	[E4]	~ 400 cents [Δ]
<u>125</u>	↓	[F4]	~ 500 cents [Δ]
<u>150</u>	↓	[F# 4]	~ 600 cents [Δ]
<u>175</u>	↓	[G4]	~ 700 cents [Δ]
<u>200</u>	↓	[G# 4]	~ 800 cents [Δ]
<u>225</u>	↓	[A4]	~ 900 cents [Δ]
<u>250</u>	↓	[A# 4]	~ 1000 cents [Δ]
<u>275</u>	↓	[B4]	~ 1100 cents [Δ]
<u>300</u>	heptaméridas	[C5]	~ 1200 cents [Δ] = 523.24 Hz [C5]

NOTES

CENTS

Parcours $\log(100)^{(1 / 1200)} = 1.00057778951$ [PIL]

PIL : produit de l'indice logarithmique

Hertz / Sauveurs

$\log(100)^{(1 / 300)} = 1.00231316184$ [PIL] 1 Hz

$\log(100)^{(25 / 300)} = 1.05946309436$ [PIL] 1/2 tono

$\log(100)^{(50 / 300)} = 1.12246204831$ [PIL] 1 tono

$\log(100)^{(300 / 300)} = 2$ [PIL] 8^{va}

Exemple opérationnel

$(\log(100)^{(50 / 300)}) * 261.62$ [C4] = 293.658521079 [D4]

$(\log(100)^{(50 / 300)}) * 261.62 = 293.658521079$ [D⁴]

I) $293.658521079 - 261.62 = 32.038521079$ [Hz]

II) $293.658521079 - 32.0385210787 = 261.62$ [C⁴]

.....

$(\log(100)^{(25 / 300)}) * 261.62 = 277.176734746$ [C#⁴]