Canon

F-789SGA

Calculation Examples
Beispiele für Berechnungen
Exemples de calcul
Ejemplos de cálculo
Esempi di calcolo
Rekenvoorbeelden
Regneeksempler
Laskentaesimerkkejä
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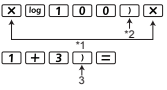
Exemplos de cálculos
αραδείγματα υπολογισμών

ENGLISH
DEUTSCH
FRENCH
ESPAÑOL
ITALIANO
NEDERLANDS
DANSK
SUOMI
SVENSKA
PORTUGUÊS
ΕΛΛΗΝΙΚΑ

E-IM-2724

EX #1

Example	Key In Operation	Display
Including [×] *1, [)] *2, [)] *3		2xlog(100) x (1+3) 16
Omitting [×] *1, [)] *3	[2] [log] [1] [0] [0] [)] [(] [1] [+] [3] [=]	2log(100)(1+3) 16

EX #2

LINE MODE: [Shift] [SET-UP] [2]

Mode Setting	Key In operation	Display (input Line only)
Method 1: Insert mode	1234567 [+] 889900 [◄] 7 times	1234567I+889900
	[DEL] [0]	1234560I+889900
Method 2: Overwrite mode	[Shift] [SET-UP] [2] 1234567 [+] 889900 [Shift] [Insert]	1234567+889900_
	[◄] 8 times	1234567+889900
	[0]	1234560+889900

EX #3

LINE MODE: Shift SET-UP 2

Mode Setting	Key In operation	Display
Method 1:	◁ 12times	12|34567+889900
Insert mode	DEL	1|34567+889900
Method 2:	Shift Insert	1234567+889900_
Overwrite mode	◁ 13times	1234567+889900
	DEL	134567+889900

EX #4

MATHEMATICS MODE: Shift SET-UP 1

Mode Setting	Key In operation	Display
Insert mode	◁ 6times	1234567+|889900
	2	1234567+2|889900

EX #5

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
$\left\|\sqrt{3}-\frac{2}{\sqrt{2}}\right\|$	Abs √□ 3 ▷ − 2 $\frac{\square}{\square}$ √□ 2 =	$\left\|\sqrt{3}-\frac{2}{\sqrt{2}}\right\|$ $\sqrt{3}-\sqrt{2}$

EX #6 Calculation Precision, Input Range / Berechnung Präzision, Eingangsbereich / Calcul de précision, plages des valeurs d'entrée / Cálculo de precisión, Rango de entrada / Calcolo di precisione, Rango de entrada / Rekenprecisie, Invoerberelk / Beregning Precision, Inputområde / Laskelma Precision, Syöttöalue / Beräkning Precision, Inmatningsområde / Cálculo de Precisão, Limite de entrada / Υπολογισμός ακριβείας, Περιοχή εισαγωγής

E	Number of Digits for Internal Calculation	18 digits
	Precision*	±1 at the 10th digit for a single calculation. ±1 at the least significant for exponential display
	Calculation Range	$\pm 1 \times 10^{-99}$ to $\pm 9.999999999 \times 10^{99}$ or 0
D	Anzahl Ziffern für die interne Berechnung	18 Zeichen beinhalten
	Präzision*	±1 an der 10. Stelle bei einer einzelnen Berechnung. ±1 an der letzten signifikanten Stelle bei der Exponentialdarstellung
	Rechenbereich	$\pm 1 \times 10^{-99}$ bis $\pm 9.999999999 \times 10^{99}$ oder 0
F	Nombre de chiffres pour les calculs internes	18 chiffres
	Précision*	±1 sur le dixième chiffre pour un calcul unique. ±1 sur le demier chiffre significatif pour l'affichage exponentiel.
	Plage de calcul	$\pm 1 \times 10^{-99}$ à $\pm 9.999999999 \times 10^{99}$ ou 0
ES	Número de dígitos del cálculo interno	18 dígitos
	Precisión*	±1 en el décimo digito (en cálculos simples) ±1 en el último digito significativo (en la visualización de exponentes).
	Intervalo de cálculo	$\pm 1 \times 10^{-99}$ to $\pm 9.999999999 \times 10^{99}$ o 0
I	Numero di cifre del calcolo interno	18 cifre
	Precisione*	±1 alla 10a cifra per un unico calcolo. ±1 all'ultima cifra significativa in caso di visualizzazione esponenziale.
	Intervallo di calcolo	$\pm 1 \times 10^{-99}$ a $\pm 9.999999999 \times 10^{99}$ o 0

NL	Aantal cijfers van interne berekening	18 cijfers bewaren
	Precisie*	±1 bij het tiende cijfer voor één berekening. ±1 bij het laatste significante cijfer voor de exponentiële weergave.
	Berekeningsbereik	±1 × 10^{-99} tot ±9.999999999 × 10^{99} of 0
DA	Antal cifre i intern udregning	18 cifre
	Præcision*	±1 ved det 10. Ciffer for en enkelt beregning. ±1 ved sidste signifikante ciffer ved eksponentiel visning.
	Udregningsområde	±1 × 10^{-99} til ±9.999999999 × 10^{99} eller 0
FI	Sisäisen laskutoimituksen numeroiden lukumäärä	18 numeroa
	Tarkkuus*	±1 yksittäisessä laskussa 10. Numerolla. ±1 viimeisessä merkitsevässä numerossa eksponentiaalinäytössä.
	Laskenta-alue	±1 × 10^{-99} to ±9.999999999 × 10^{99} tai 0
SE	Antal siffror i intern beräkning	18 siffror
	Precision*	±1 vid den 10:e siffran för en enstaka beräkning. ±1 är den sista signifikanta siffran för exponentiell visning.
	Beräkningsområde	±1 × 10^{-99} to ±9.999999999 × 10^{99} eller 0
PT	Número de dígitos de cálculo interno	18 dígitos
	Precisão*	±1 no 10º digito para um cálculo único. ±1 no último digito significativo para o ecrã.
	Intervalo de cálculo	±1 × 10^{-99} a ±9.999999999 × 10^{99} ou 0
EL	Αριθμός ψηφίων για εσωτερικό υπολογισμό	18 ψηφίο
	Ακρίβεια*	1 στο 10ο ψηφίο για έναν υπολογισμό. 1 στο τελευταίο σημαντικό ψηφίο, για τηνεκθετική προβολή.
	Εύρος τιμών υπολογισμού	1 x 10^{-99} έως 9.999999999 x 10^{99}

Input Ranges / Eingangsbereich / Plages des valeurs d'entrée / Rango de entrada / Rango de entrada / Invoerberelk / Inputområde / Syöttöalue / Inmatningsområde / Limite de entrada / Περιοχή εισαγωγής

Functions	Input Range	
sinx	DEG	$0 \leqq \|x\| < 9\times10^{9}$
	RAD	$0 \leqq \|x\| <$ 157 079 632.7
	GRA	$0 \leqq \|x\| < 1\times10^{10}$
cosx	DEG	$0 \leqq \|x\| < 9\times10^{9}$
	RAD	$0 \leqq \|x\| <$ 157 079 632.7
	GRA	$0 \leqq \|x\| < 1\times10^{10}$
tanx	DEG	Same as sinx, except when $\|x\| = (2n-1)\times90$
	RAD	Same as sinx, except when $\|x\| = (2n-1)\times \pi/2$
	GRA	Same as sinx, except when $\|x\| = (2n-1)\times100$
$\sin^{-1}x$	$0 \leqq \|x\| \leqq 1$	
$\cos^{-1}x$		
$\tan^{-1}x$	$0 \leqq \|x\| \leqq 9.999\ 999\ 999\times10^{99}$	
sinhx	$0 \leqq \|x\| \leqq$ 230 258 509 2	
coshx		
$\sinh^{-1}x$	$0 \leqq \|x\| \leqq 4.999\ 999\ 999\times10^{99}$	
$\cosh^{-1}x$	$1 \leqq x \leqq 4.999\ 999\ 999\times10^{99}$	
tanhx	$0 \leqq \|x\| \leqq 9.999\ 999\ 999\times10^{99}$	
$\tanh^{-1}x$	$0 \leqq \|x\| \leqq 9.999\ 999\ 999\times10^{-1}$	
logx/lnx	$0< x \leqq 9.999\ 999\ 999\times10^{99}$	
10^{x}	$-9.999\ 999\ 999\times10^{99} \leqq x \leqq 99.999\ 999\ 99$	
e^{x}	$-9.999\ 999\ 999\times10^{99} \leqq x \leqq$ 230.258 509 2	
$\sqrt{x}$	$0 \leqq x < 1\times10^{100}$	
x^{2}	$\|x\| < 1\times10^{50}$	
x^{3}	$\|x\| \leqq 2.154\ 434\ 69\times10^{33}$	
x^{-1}	$\|x\| < 1\times10^{100}, x \neq 0$	
$\sqrt[3]{x}$	$\|x\| < 1\times10^{100}$	
x!	$0 \leqq x \leqq 69$ (x is an integer)	

Functions	Input Range
nPr	$0 \leqq n < 1 \times 10^{10}$, $0 \leqq r \leqq n$ (n,r are integers)
	$1 \leqq \{n!/((n-r)!\} < 1 \times 10^{100}$
nCr	$0 \leqq n < 1 \times 10^{10}$, $0 \leqq r \leqq n$ (n,r are integers)
	$1 \leqq n!/r! < 1 \times 10^{100}$ or $1 \leqq n!/(n-r)! < 1 \times 10^{100}$
Pol(x,y)	$\lvert x\rvert, \lvert y\rvert \leqq 9.999\ 999\ 999 \times 10^{99}$ $\sqrt{x^2+y^2} \leqq 9.999\ 999\ 999 \times 10^{99}$
Rec(r,θ)	$0 \leqq r \leqq 9.999\ 999\ 999 \times 10^{99}$ θ : Same as sinx
° ′ ″	$\lvert a\rvert, b, c < 1 \times 10^{100}$ $0 \leqq b, c$ The display seconds value is subject to an error of +/-1 at the second decimal place
◀ ° ′ ″	$\lvert x\rvert < 1 \times 10^{100}$ Deciaml ↔ Sexagesimal Conversions $0°0'0'' \leqq \lvert x\rvert \leqq 9999999°59'59''$
$^{(x^y)}$	x>0: $-1 \times 10^{100} <$ ylog x < 100 x=0: y>0 x<0: y=n,m/(2n+1) (m,n are integers) However: $-1 \times 10^{100} <$ ylog|x|<100
$\sqrt[x]{y}$	y>0: x≠0, $-1 \times 10^{100} <$ 1/x logy<100 y=0:x>0 y<0:x=2n+1,(2n+1)/m (m≠0;m,n are integers)
a b/c	Total of integer, numerator, and denominator must be 10 digits or less (including division marks).
i~Rand(a,b)	$0 \leqq a < 1 \times 10^{10}$, $0 \leqq b < 1 \times 10^{10}$ (a,b should be positive integers or 0)
Rand	Result generates a 3 digits pseudo random number(0.000~0.999)
LCM(x,y,z)	0<x, y, z ≦ 9.999 999 999x10^{12} (positive integers) Default result when x, y, z=0
GCD(x,y,z)	0<x, y, z ≦ 9.999 999 999x10^{12} (positive integers) Default result when x, y, z=0

Functions	Input Range
Q…r(x,y)	0<x,y ≦ 9.999 999 999x10^12 (positive integers) 0 ≦ Q ≦ 999 999 9999, 0 ≦ r ≦ 999 999 9999 (Q,r are integers) Default result when x=0
Mod(x,y)	0<|x,y| ≦ 9.999999999x10^12 Default result=x when y=0
Single-variable	|x|<1x10^100 |FREQ|<1x10^100
Paired-variable	|x|<1x10^100 |y|<1x10^100 |FREQ|<1x10^100
ABS	|x|<1x10^100
Pfact	x ≦ 9999999999 (positive integers)
BIN	Positive: 0~0111 1111 1111 1111 1111 1111 1111 1111 Negative: 1000 0000 0000 0000 0000 0000 0000 0000~ 1111 1111 1111 1111 1111 1111 1111 1111
DEC	Positive: 0~2147483647 Negative: -2147483648~-1
OCT	Positive: 0~177 7777 7777 Negative: 200 0000 0000~377 7777 7777
HEX	Positive: 0~7FFF FFFF Negative: 8000 0000~FFFF FFFF
∑ *(f(x),a, b)*	*a* and *b* are integers in the range of –1 • 10^10 < *a* ≦ *b* <1 • 10^10.
∏ *(f(x),a, b)*	*a* and *b* are integers in the range of –1 • 10^10 < *a* ≦ *b* <1 • 10^10.

EX #7

1st Priority	Recall memory (A, B, C, D, E, F, 0-9), Rand
2nd	Calculation within parentheses ( ).
3rd	Function with parenthesis that request the input argument to the right Pol(, Rec(, d/dx, ∫dx, P(, Q(, R(, Det(, Trn(, Ide(, Adj(, Inv(, Arg(, Conjg(, Real(, Imag(, sin(, cos(, tan(, $\sin^{-1}$(, $\cos^{-1}$(, $\tan^{-1}$(, sinh(, cosh(, tanh(, $\sinh^{-1}$(, $\cosh^{-1}$(, $\tanh^{-1}$(, log(, ln(, e^(, 10^(, $\sqrt{\ }$(, $\sqrt[3]{\ }$(, Abs(, ROUND(, LCM(, GCD(, Q…r(, i~Rand(,
4th	Functions that come after the input value preceded by values, powers, power roots: x^2, x^3, x^{-1}, x!, ° ' ", °, r, g, ^(, $\sqrt[x]{\ }$(, Percent %, $\log_a b$, EXP, ▶t
5th	Fractions: a b/c, d/c
6th	Prefix symbol: (–) (negative sign), base-n symbols (d, h, b, o, Neg, Not)
7th	Statistical estimated value calculation: $\hat{x}$, $\hat{y}$, $\hat{x}1$, $\hat{x}2$ Metric conversion commands (cm → in, etc)
8th	Multiplication where sign is omitted: Multiplication sign omitted immediately before π, e, variables (2π, 5A, πA, etc.), functions with parentheses (2√(3), Asin(30), etc.)
9th	Permutations, combinations: nPr, nCr Complex number polar coordinate symbol (<)
10th	Dot: ▪
11th	Multiplication and division: ×, ÷
12th	Addition and subtraction: +, –
13th	Logical AND (and)
14th	Logical OR, XOR, XNOR (or, xor, xnor)
15th	Calculation ending instruction: =, M+, M- STO (store memory), ▶r<θ, ▶a+bi

EX #8

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
$(-2.5)^2$	((−) 2 • 5) x^2 =	$(-2.5)^2$ $\frac{25}{4}$
$(4 \times 10^{75})(-2 \times 10^{-79})$	4 EXP 7 5 × (−) 2 EXP (−) 7 9 =	$4_E75\times$ $-\frac{1}{1250}$

EX #9

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
23 + 7 → A	2 3 + 7 Shift STO A	23+7→A 30
2 x sin A = 1	2 sin Alpha A =	2sin(A 1
Clear memory	0 Shift STO A	0→A 0

EX #10

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
123 + 456 → M+, Ans² = 335,241	1 2 3 + 4 5 6 M+ x^2 =	Ans² 335241
789900 – Ans = 454,659	7 8 9 9 0 0 − Ans =	789900-Ans 454659

EX #11

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
$1\frac{1}{2}+\frac{5}{6}=\frac{7}{3}$	1 Shift $\blacksquare\frac{\blacksquare}{\blacksquare}$ 1 → 2 → + 5 $\frac{\blacksquare}{\blacksquare}$ 6 =	$1\frac{1}{2}+\frac{5}{6}$ $\frac{7}{3}$
$\frac{7}{3}\leftrightarrow 2.333333333$ (Fraction ↔ Decimal)	F↔D	$1\frac{1}{2}+\frac{5}{6}$ 2.333333333
$2.333333333\leftrightarrow 2\frac{1}{3}$ (Decimal ↔ Mixed Fraction)	Shift $a\frac{b}{c}\leftrightarrow\frac{d}{c}$	$1\frac{1}{2}+\frac{5}{6}$ $2\frac{1}{3}$

EX #12

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
To calculate 25% of 820	8 2 0 × 2 5 Shift % =	820x25% 205
The percentage of 750 against 1250	7 5 0 ÷ 1 2 5 0 Shift % =	750÷1250% 60

EX #13

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
86°37'34.2" ÷ 0.7 = 123°45'6"	8 6 ° ' " 3 7 ° ' " 3 4 • 2 ° ' " ÷ 0 • 7 =	86°37 ° 34.2 ° ÷ 0.7 123°45'6"
123°45'6" → 123.7516667	° ' "	86°37 ° 34.2 ° ÷ 0.7 123.7516667
2.3456 → 2°20'44.16"	2 • 3 4 5 6 = ° ' "	2.3456 2°20'44.16"

EX #14

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
1x12=12 2+25=27 using a multi-statement	1 × 1 2 Alpha : 2 + 2 5	1x12:2+25
	=	▲ Disp 1x12 12
	=	▲ 2+25 27
Replay the previous calculation history (1 x 12 = 12)	^	▼ 1x12 12

EX #15

MATHEMATICS MODE: Shift SET-UP 1

Key in Operation	Display
Shift C-Value (menu selection page)	Input 1−79 0 0 ◀mP mn me mμ ao▶
3 5 =	g
+ 35 =	g+35 44.80665
= = × 50 =	Ansx50 2240.3325

EX #16

NO.	Constant	Symbol	Value	Unit
1.	Proton mass	m_p	1.672621777x10^{-27}	kg
2.	Neutron mass	m_n	1.674927351 x10^{-27}	kg
3.	Electron mass	m_e	9.10938291x10^{-31}	kg
4.	Muon mass	m_μ	1.883531475x10^{-28}	kg
5.	Bohr radius α / 4πR ∞	a_0	0.52917721092x10^{-10}	m
6.	Planck constant	h	6.62606957 x10^{-34}	J s
7.	Nuclear magneton e $\hbar$ / 2m_p	μ_N	5.05078353 x10^{-27}	J T^{-1}
8.	Bohr magneton e $\hbar$ / 2m_e	μ_B	927.400968 x10^{-26}	J T^{-1}
9.	h / 2π	$\hbar$	1.054571726 x10^{-34}	J s
10.	Fine-structure constant e^2 / 4$\pi\varepsilon_0$ $\hbar$ c	α	7.2973525698x10^{-3}	
11.	Classical electron radius $\alpha^2 a_0$	r_e	2.8179403267x10^{-15}	m
12.	Compton wavelength h / m_ec	λ_c	2.4263102389 x10^{-12}	m
13.	Proton gyromagnetic ratio 2μ_p / $\hbar$	γ_p	2.675222005 x10^{8}	s^{-1} T^{-1}
14.	Proton Compton wavelength h / m_p c	$\lambda_{c,p}$	1.32140985623 x10^{-15}	m
15.	Neutron Compton wavelength h / m_nc	$\lambda_{c,n}$	1.3195909068x10^{-15}	m
16.	Rydberg constant $\alpha^2 m_e c$ / 2 h	R∞	10973731.568539	m^{-1}
17.	(unified) atomic mass unit	u	1.660538921 x10^{-27}	kg
18.	Proton magnetic moment	μ_p	1.410606743x10^{-26}	J T^{-1}
19.	Electron magnetic moment	μ_e	-928.476430x10^{-26}	J T^{-1}
20.	Neutron magnetic moment	μ_n	-0.96623647 x10^{-26}	J T^{-1}
21.	Muon magnetic moment	μ_μ	-4.49044807 x10^{-26}	J T^{-1}
22.	Faraday constant N_Ae	F	96485.3365	C mol^{-1}
23.	Elementary charge	e	1.602176565x10^{-19}	C
24.	Avogadro constant	NA	6.02214129x10^{23}	mol^{-1}
25.	Boltzmann constant R / N_A	k	1.3806488 x10^{-23}	J K^{-1}
26.	Molar volume of ideal gas RT / p T=273.15 K, p=101.325 kPa	Vm	22.413968 x10^{-3}	m^3 mol^{-1}
27.	Molar gas constant	R	8.3144621	J mol^{-1} K^{-1}
28.	Speed of light in vacuum	c_0	299792458	m s^{-1}
29.	First radiation constant 2πhc^2	c_1	3.74177153x10^{-16}	W m^2
30.	Second radiation constant hc/k	c_2	1.4387770 x10^{-2}	m K

NO.	Constant	Symbol	Value	Unit
31.	Stefan-Boltzmann constant	σ	5.670373×10^{-8}	$W\ m^{-2}\ K^{-4}$
32.	Electric constant $1 / \mu_0 c^2$	ε_0	$8.854187817 \times 10^{-12}$	$F m^{-1}$
33.	Magnetic constant	μ_0	$12.566370614 \times 10^{-7}$	$N A^{-2}$
34.	Magnetic flux quantum $h / 2e$	Φ_0	$2.067833758 \times 10^{-15}$	Wb
35.	Standard acceleration of gravity	g	9.80665	$m s^{-2}$
36.	Conductance quantum $2e^2/h$	G_0	$7.7480917346 \times 10^{-5}$	S
37.	Characteristic impedance of vacuum $\sqrt{\mu_0} / \varepsilon_0 = \mu_0 c$	Z_0	376.730313461	Ω
38.	Celsius temperature	t	273.15	
39.	Newtonian constant of gravitation	G	6.67384×10^{-11}	$m^3\ kg^{-1}\ s^{-2}$
40.	Standard atmosphere	atm	101325	Pa
41.	Proton g-factor $2 \mu_p / \mu_N$	g_p	5.585694713	
42.	$\lambda_{c,n} / 2\pi$	$\lambda\!\!\!^{-}_{c,n}$	$0.21001941568 \times 10^{-15}$	m
43.	Planck length $\hbar / m_P c = (\hbar G / c^3)^{1/2}$	l_P	1.616199×10^{-35}	m
44.	Planck time $l_P / c = (\hbar G / c^5)^{1/2}$	t_P	5.39106×10^{-44}	s
45.	Planck mass $(\hbar c / G)^{1/2}$	m_P	2.17651×10^{-8}	kg
46.	Atomic mass constant	m_u	$1.660538921 \times 10^{-27}$	kg
47.	Electron volt: (e/c) J	eV	$1.602176565 \times 10^{-19}$	J
48.	Molar planck constant	$N_A h$	$3.9903127176 \times 10^{-10}$	J s mol^{-1}
49.	Wien displacement law constant	b	2.8977721×10^{-3}	m K
50.	Lattice parameter of Si(in vacuum, 22.5°C)	a	543.1020504 x 10^{-12}	m
51.	Hartree energy $e^2/4\pi\varepsilon_0 a_0$	Eh	$4.35974434 \times 10^{-18}$	J
52.	Loschmidt constant N_A / Vm	n_0	2.6867805×10^{25}	m^{-3}
53.	Inverse of conductance quantum	G_0^{-1}	12906.4037217	Ω
54.	Josephson constant $2e/h$	K_J	483597.870×10^9	Hz V^{-1}
55.	Von Klitzing constant h/e^2	R_K	25812.8074434	Ω
56.	$\lambda_c / 2\pi$	$\lambda\!\!\!^{-}_c$	$386.15926800 \times 10^{-15}$	m
57.	Thomson cross section $(8\pi/3) r^2_e$	σ_e	$0.6652458734 \times 10^{-28}$	m^2
58.	Electron magnetic moment anomaly $\lvert \mu_e \rvert / \mu_B - 1$	a_e	$1.15965218076 \times 10^{-3}$	
59.	Electron g-factor-2(1+ a_e)	g_e	-2.00231930436153	
60.	Electron gyromagnetic ratio $2\lvert \mu_e \rvert / \hbar$	γ_e	$1.760859708 \times 10^{11}$	$s^{-1}\ T^{-1}$
61.	Muon magnetic moment anomaly	a_μ	$1.16592091 \times 10^{-3}$	
62.	Muon g-factor-2(1+ a_μ)	g_μ	-2.0023318418	

NO.	Constant	Symbol	Value	Unit
63.	Muon Compton wavelength $h / m_{\mu} c$	$\lambda_{c,\mu}$	11.73444103x10^{-15}	m
64.	$\lambda_{c,\mu} / 2\pi$	$\lambda\!\!\!^{-}_{c,\mu}$	1.867594294x10^{-15}	m
65.	Tau Compton wavelength $h / m_{\tau} c$	$\lambda_{c,\tau}$	0.697787 x10^{-15}	m
66.	$\lambda_{c,\tau} / 2\pi$	$\lambda\!\!\!^{-}_{c,\tau}$	0.111056 x10^{-15}	m
67.	Tau mass	m_{τ}	3.16747 x10^{-27}	kg
68.	$\lambda_{c,p} / 2\pi$	$\lambda\!\!\!^{-}_{c,p}$	0.21030891047 x10^{-15}	m
69.	Shielded proton magnetic moment(H_2O, sphere, 25°C)	μ'_p	1.410570499 x10^{-26}	J T^{-1}
70.	Neutron g-factor $2\,\mu_n / \mu_N$	g_n	-3.82608545	
71.	Neutron gyromagnetic ratio $2\lvert\mu_n\rvert / \hbar$	γ_n	1.83247179 x10^{8}	s^{-1} T^{-1}
72.	Deuteron mass	m_d	3.34358348 x10^{-27}	kg
73.	Deuteron magnetic moment	μ_d	0.433073489 x10^{-26}	J T^{-1}
74.	Helion mass	m_h	5.00641234 x10^{-27}	kg
75.	Shielded helion magnetic moment(gas, sphere, 25°C)	μ'_h	-1.074553044 x10^{-26}	J T^{-1}
76.	Shielded helion gyromagnetic ratio $2\lvert\mu'_h\rvert / \hbar$ (gas, sphere, 25°C)	γ'_h	2.037894659 x10^{8}	s^{-1} T^{-1}
77.	Alpha particle mass	m_{α}	6.64465675 x10^{-27}	kg
78.	Shielded proton gyromagnetic ratio $2\,\mu'_p / \hbar$ (H_2O, sphere, 25°C)	γ'_p	2.675153268 x10^{8}	s^{-1} T^{-1}
79.	Proton magnetic shielding correction $1-\mu'_p / \mu_p$(H_2O, sphere, 25°C)	σ'_p	25.694 x10^{-6}	

! Constant values cannot perform rounding. / Konstante Werte kann keine Rundung. / Les valeurs constantes ne peuvent pas effectuer d'arrondi. / Los valores constantes no se puede realizar el redondeo. / Valori costanti non può eseguire arrotondamenti. / Constante waarden kunnen niet worden uitgevoerd afronding. / Konstante værdier kan ikke udføre afrunding. / Nykyarvoina ei tehdä eroja. / Konstanta värden kan inte utföra avrundning. / Valores constantes não podem executar o arredondamento. / Σταθερή αξία δεν μπορεί να εκτελέσει τη στρογγυλοποίηση.

Source: CODATA Internationally 2010 / **Quelle:** CODATA Internationally 2010 / **Source:** Conférence internationale CODATA 2010 / **Fuente:** CODATA Internationally 2010 / **Fonte:** CODATA Internationally 2010 / **Bron:** CODATA Internationaal 2010 / **Kilde:** CODATA Internationally 2010 / **Lähde:** CODATA International 2010 / **Källa:** CODATA Internationally 2010 / **Fonte:** CODATA Internationally 2010 / **Πηγή:** CODATA Internationally 2010

http://physics.nist.gov/constants

EX #17

Page	Symbol	Unit
1	feet	feet
1	m	meter
1	mil	milliliter
1	mm	millimeter
1	in	inch
1	cm	centimeter
1	yd	yard
1	mile	mile
1	km	kilometer
2	ft^2	square foot
2	yd^2	square yard
2	m^2	square meter
2	$mile^2$	square mile
2	km^2	square kilometer
2	hectares	hectare
2	acres	acre
3	^oF	degree Fahrenheit
3	^oC	degree Celsius
4	gal	gallon (U.K.)
4	liter	liter
4	B.gal	gallon (U.S.)
4	pint	pint
4	fl.oz	fluid ounces (U.S.)
5	Tr.oz	ounce (troy or apothecary)
5	oz	ounces
5	lb	libra
5	Kg	kilogram
5	g	gram
6	J	joule
6	cal.f	calorie
7	atm	standard atmosphere
7	Kpa	kilopascal
7	mmHg	millimeter of mercury
7	cmH_2O	centimeter of water
8	m/s	Meter per second
8	km/h	Kilometer per hour

EX #18

MATHEMATICS MODE: Shift SET-UP 1

Key in Operation	Display
1 0 + 5 CONVT (menu selection menu)	Unit (distance) ▲▼ feet m mil mm in cm yd mile km
⊙ = (confirm selection ft^2)	ft^2 yd^2 m^2 $mile^2$ km^2 ha acres 5
⊙ ⊙ = (confirm the value convert into m^2)	$10+5ft^2 \blacktriangleright m^2$
=	$10+5ft^2 \blacktriangleright m^2$ ▲ 10.4645152

EX #19

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
$\left(\sqrt[3]{2^2+5^3}\right)^{-1}\times\pi$ = 0.6217559776	(Shift $\sqrt{\square}$ 2 x^2 + 5 Shift $x^{\square}$ ⊙) x^{-1} × Shift π =	$\left(\sqrt[3]{2^2+5^3}\right)^{-1}\times\pi$ 0.6217559776
$\left(\sqrt[6]{2^6}+\sqrt[5]{243}\right)$ = 7	(Shift $\sqrt{\square}$ 2 $x^{\square}$ 6 ⊙ ⊙ + Shift $\sqrt{\square}$ 5 ⊙ 2 4 3 ⊙) =	$\left(\sqrt[6]{2^6}+\sqrt[5]{243}\right)$ 7

EX #20

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
$e^{-3} + 10^{1.2} + \ln 3 = 16.99733128$	Shift e^a (−) 3 → + Shift 10^n 1 • 2 → + ln 3 =	$e^{-3}+10^{1.2}+\ln(3$ 16.99733128
$\log_3 81 - \log 1 = 4$	Alpha $\log_a\square$ 3 → 8 1 → − log 1 =	$\log_3(81)-\log(1$ 4

EX #21

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
Convert 180 degree into radian and gradient ($180^o = \pi^{Rad} = 200^{Gad}$)	Shift SET-UP 4 1 8 → 0 Shift DRG▸ 1 =	180º R π
	Shift SET-UP 5 =	180º 200

EX #22

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
Degree Mode	Shift SET-UP 3	D
Sin 60 = $\frac{\sqrt{3}}{2}$	sin 6 0 =	sin(60 $\frac{\sqrt{3}}{2}$
$\frac{1}{Sin45^\circ}$ = Cosec 45° = $\sqrt{2}$	sin 4 5) x^{-1} =	$\sin(45)^{-1}$ $\sqrt{2}$

EX #23

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
sinh2.5 – cosh 2.5 = -0.082084998	hyp 1 2 • 5) − hyp 2 2 • 5) =	sinh(2.5) – cosh(▷ -0.08208499862
$\cosh^{-1}45$ = 4.499686191	hyp 5 4 5 =	$\cosh^{-1}$(45 4.499686191

EX #24

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
${}_{10}P_3 = 720$	1 0 Shift nPr 3 =	10**P**3 720
${}_5C_2 = 10$	5 Shift nCr 2 =	5**C**2 10
5! = 120	5 Shift x! =	5! 120

EX #25

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
Generate a random number between 0.000 & 0.999	Shift Rand =	Rand $\frac{139}{1000}$
Generate an integer from a range of 1 to 100	Alpha i-Rand 1 Shift , 1 0 0 =	i~Rand(1,100 33

EX #26

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
LCM(15, 27, 39) = 1755	Apps 7 1 5 Shift , 2 7 Shift , 3 9 =	LCM(15,27,39 1755

LINE MODE: Shift SET-UP 2

Example	Key in operation	Display
GCD(12, 24, 60) = 12	Apps 8 1 2 Shift , 2 4 Shift , 6 0 =	GCD(12,24,60 12

EX #27

MATHEMATICS MODE: Shift SET-UP 1

Key in Operation	Display
9 9 9 9 9 9 9 9 9 9 = Shift PFact	9999999999 3^2x11x41x271x(9▶
1 7 7 7 = Shift PFact	1777 (1777)

EX #28

LINE MODE: Shift SET-UP 2

Example	Key in operation	Display
35 ÷ 10 = 3 x 10 +5 Q=3 R=5	Apps 5 3 5 Shift , 1 0 =	Q…r(35, 10 Q= 3 R= 5
Quotient value (Q) + 3 = 6	+ 3 =	Ans+3 6
Recall Quotient value (Q)	RCL C	C 3
Recall Remainder value (r)	RCL D	D 5

EX #29

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
With rectangular coordinate (x=1, y= √3). Find Polar coordinate (r, θ) at degree mode	Shift Pol(1 Shift , √□ 3 =	Pol(1, √3 r=2, θ=60
	RCL X	X 2
	RCL Y	Y 60

EX #30

LINE MODE: Shift SET-UP 2

Example	Key in operation	Display
With Polar coordinate (r=2, θ=60°). Find Rectangular coordinate (x, y) at degree mode	Shift Rec(2 Shift , 6 0 =	Rec(2, 60 X= 1 Y= 1.732050808
	RCL X	X 1
	RCL Y	Y 1.732050808

EX #31

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
$\lvert\sin(60-5)\times(-\pi)\rvert$	Abs sin 6 0 — 5) × ((−) Shift π) =	$\lvert\sin(60-5)\times(-\pi)\rvert$ 2.573442045

EX #32

LINE MODE: Shift SET-UP 2

Example	Key in operation	Display
$1\div200 = 5\times10^{-3}$	1 ÷ 2 0 0 =	1÷200 5×10^{-3}
	ENG ENG	1÷200 5000×10^{-6}
	Shift ENG	1÷200 5×10^{-3}

EX #33

LINE MODE: Shift SET-UP 2

Example	Key in operation	Display
$\frac{2}{3}+2=\frac{8}{3}=2.666666667$	2 $\frac{\square}{\square}$ 3 + 2 =	2⌟3+2 8⌟3
	F↔D	2⌟3+2 2.666666667

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
$\frac{2}{3}+2=\frac{8}{3}=2.666666667$	2 $\frac{\square}{\square}$ 3 ▷ + 2 =	$\frac{2}{3}$+2 $\frac{8}{3}$
	F↔D	$\frac{2}{3}$+2 2.666666667
$\tan 30=\frac{\sqrt{3}}{3}$ =0.5773502692	tan 3 0 =	tan(30 $\frac{\sqrt{3}}{3}$
	F↔D	tan(30 0.5773502692
$\pi \div 8=\frac{1}{8}\pi$ =0.3926990817	Shift π ÷ 8 =	$\pi \div 8$ $\frac{1}{8}\pi$
	F↔D	$\pi \div 8$ 0.3926990817

EX #34

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
3+4 *i* = 5∠53.13010235	3 + 4 *i* Apps 1 =	3+4 *i* ▶r∠θ 5∠53.13010235
√2<45=1+ *i*	√ 2 ▷ ∠ 4 5 Apps 2 =	√2∠45=▶a+b*i* 1+ *i*

EX #35

LINE MODE: Shift SET-UP 2

Example	Key in operation	Display
Absolute value (r) and argument (θ) if complex number is 6+8 *i*	Abs 6 + 8 *i*) =	Abs (6+8 *i*) 10
	▷ DEL Apps 3 =	Arg (6+8 *i*) 53.13010235

EX #36

LINE MODE: Shift SET-UP 2

Example	Key in operation	Display
3+4 *i* is 3–4 *i*	Apps 4 3 + 4 *i*) =	Conjg (3+4 *i*) 3 - 4 *i*

EX #37

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
Real and Imaginary values of a complex number is 23<54	Apps 5 2 3 ∠ 5 4) =	Real(23∠54) 13.5190608
	▶ DEL Apps 6 =	Imag(23∠54) 18.60739087

EX #38

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
10101011+1100–1001x101÷10 =10100001 (in Binary Mode)	BIN 1 0 1 0 1 0 1 1 + 1 1 0 0 − 1 0 0 1 × 1 0 1 ÷ 1 0 =	10101011+1100–1▷ BIN 1010 0001
645+321–23x7÷2 =1064 (in Octal Mode)	OCT 6 4 5 + 3 2 1 − 2 3 × 7 ÷ 2 =	645+321-23x7÷2 OCT 00000001064
(77A6C+D9)xB÷F =57C87 (in Hexadecimal Mode)	HEX (7 7 A 6 C + D 9) × B ÷ F =	(77A6C+D9)xB÷F HEX 00057C87

EX #39

MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
12345+101=12446	1 2 3 4 5 + 1 0 1 =	12345+101 DEC 12446
	HEX	12345+101 HEX 000309E
	BIN	12345+101 ◀BIK 1/2 BIN 1001 1110
	OCT	12345+101 OCT 00000030236

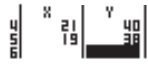
EX #40 MATHEMATICS MODE: Shift SET-UP 1

Example	Key in operation	Display
789ABC Xnor 147258	7 8 9 A B C Apps 4 1 4 7 2 5 8 =	789ABCxnor147258 HEX FF93171B
Ans or 789ABC	Ans Apps 2 7 8 9 A B C =	Ansor789ABC HEX FFFB9FBF
Neg 789ABC	Apps 6 7 8 9 A B C =	Neg(789ABC HEX FF876544

EX #41 LINE MODE: Shift SET-UP 2

Key in operation	Display
MODE 3	1:SD 2:Lin 3:Quad 4:Log 5:e EXP 6:ab EXP 7:Pwr 8:Inv
1 (SD)	
7 5 = 8 5 = 9 0 = 7 7 = 7 9 =	
CA Apps 4 1 =	$\sum x^2$ 33120
CA Apps 4 2 =	$\sum x$ 406
CA Apps 5 1 =	n 5
CA Apps 5 2 =	$\bar{x}$ 81.2
CA Apps 5 3 =	$x_{\sigma n}$ 5.528109984
CA Apps 5 4 =	$x_{\sigma n-1}$ 6.180614856

EX #42 LINE MODE: Shift SET-UP 2

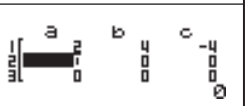
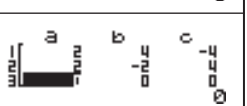
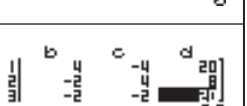
Key in operation	Display
MODE 3	1:SD 2:Lin 3:Quad 4:Log 5:e EXP 6:ab EXP 7:Pwr 8:Inv
3 (Quad)	
1 8 = 3 5 = 4 0 = 2 1 = 1 9 = ▼ ▶ 3 8 = 5 4 = 5 9 = 4 0 = 3 8 =	
CA 3 0 Apps 8 6 =	30ŷ 48.69615715
CA 5 0 Apps 8 4 =	50x̂₁ 31.30538226
CA 5 0 Apps 8 5 =	50x̂₂ -167.1096731

EX #43 LINE MODE: Shift SET-UP 2

Key in operation	Display
MODE 3 1	
2 0 = 4 3 = 2 6 = 4 6 = 2 0 = 4 3 =	
CA 2 6 Apps 7 4 =	26▶t -0.6236095645
Apps 7 1 =	P(Ans 0.26644

EX #44

MATHEMATICS MODE: Shift SET-UP 1

Key in operation	Display
MODE 5 2 (3 unknowns)	
2 = 4 = (−) 4 = 2 0 =	
2 = (−) 2 = 4 = 8 =	
5 = (−) 2 = (−) 2 = 2 0 =	
=	X= $\frac{11}{2}$
=	Y= 3
=	Z= $\frac{3}{4}$

EX #45 MATHEMATICS MODE: Shift SET-UP 1

Key in operation	Display
MODE 5 ⌄ 2 (Cubic equation)	a b c 0 0 0
5 = 2 = (−) 2 = 1 =	b c d 2 -2 1
=	X_1= -1
=	X_2= $\frac{3}{10}+0.331662479i$
=	X_3= $\frac{3}{10}-0.331662479i$

EX #46 LINE MODE: Shift SET-UP 2

Key in operation	Display
MODE 1 (COMP MODE)	0
Alpha X Alpha = (1 $\frac{\square}{\square}$ 3) Shift π Alpha B x^2 Alpha C	X=(1_|3)πB²C 0
Shift Solve	B? 0
5 = (radius is B=5cm)	C? 0
2 0 = (height is C=2cm)	Solve for X 0
= (Calculate with new variables)	X=(1_|3)πB²C X= 523.5987756 L−R = 0

EX #47

LINE MODE: Shift SET-UP 2

Key in operation	Display
MODE 1 (COMP MODE)	0
Alpha Y Alpha = 5 Alpha X x^2 − 2 Alpha X + 1	Y=5X^2–X+1 0
CALC 5 =	Y=5X^2–X+1 116
CALC 7 =	Y=5X^2–X+1 232

EX #48

LINE MODE: Shift SET-UP 2

Key in operation	Display
MODE 1 (COMP MODE)	0
Shift $\frac{d}{dx}$ sin (3 Alpha X + 3 0) Shift , 1 EXP (−) 8) =	d/dx(sin(3X+30)▷ 0.04534498409

EX #49

LINE MODE: Shift SET-UP 2

Key in operation	Display
MODE 1	0
$\int$ 5 Alpha X $x^{\square}$ 4) + 3 Alpha X x^2 + 2 Alpha X + 1 Shift , 2 Shift , 3 Shift , 4) =	$\int$(5X^(4)+3X^2+2X▷ 236

EX #50

LINE MODE: Shift SET-UP 2

Key in operation	Display
MODE 7 1 ⌄ 2	MatA:3X3
1 = 2 = 3 = 4 = 5 = 6 = 7 = 8 = 9 =	MatA:3X3
CA Apps 1 2 ⌄ 2	MatB:3X3
9 = 8 = 7 = 6 = 5 = 4 = 3 = 2 = 1 =	MatB:3X3
CA Apps 3 ×	MatA×■
Apps 4 =	MatANS:3X3

EX #51

LINE MODE: Shift SET-UP 2

Key in operation	Display
CA Apps 1 3 ▼ ▼ 3	MatC:2X2 [0 0] [0 0] 0
3 = (−) 2 = (−) 1 = 5 =	MatC:2X2 [3 −2] [−1 5] 5
CA Apps 5 × 2 =	MatAns:2x2 [6 −4] [−2 10] 6

EX #52

LINE MODE: Shift SET-UP 2

Key in operation	Display
CA Apps 1 1 ▼ 2	MatA:3X3 [0 0 0] [0 0 0] [0 0 0] 0
1 0 = (−) 5 = 3 = (−) 4 = 9 = 2 = 1 = 7 = (−) 3 =	MatA:3X3 [10 −5 3] [−4 3 −3] [1 7 −3] -3
CA Apps ▼ 1	Det(0
Apps 3) =	Det(MatA) -471

EX #53

LINE MODE: Shift SET-UP 2

Key in operation	Display
CA Apps 1 2 ⊙ 3	MatB:3X2 [■ 0 0 0 0 0] 0
9 = 5 = 6 = 2 = 8 = 4 =	MatB:3X2 [9 5 6 2 8 ■] 4
CA Apps ⊙ 2	Trn(0
Apps 4) =	MatAns:2X3 [■ 6 8 5 2 4] 9

EX #54

LINE MODE: Shift SET-UP 2

Key in operation	Display
CA Apps ⊙ 3	Ide(0
2) =	MatAns:2X2 [■ 0 0 1] 1

EX #55

LINE MODE: Shift SET-UP 2

Key in operation	Display
CA Apps 1 1 ⊙ ⊙ 3	MatA:2X2 [▮ 0] [0 0] 0
2 = 3 = 4 = 5 =	MatA:2X2 [2 ▮ 3] [4 ▮ 5] 5
CA Apps ⊙ 4	AdjA▮ 0
Apps 3) =	MatAns:2X2 [▮ -3] [-4 2] 5

EX #56

LINE MODE: Shift SET-UP 2

Key in operation	Display
CA Apps 1 3 ⊙ ⊙ 3	MatC:2X2 [▮ 0] [0 0] 0
8 = 2 = 3 = 6 =	MatC:2X2 [8 ▮ 2] [3 ▮ 6] 6
CA Apps ⊙ 5	InvA▮ 0
Apps 5) =	MatAns:2X2 [0.047 -0.047] [-0.071 0.1904] 1.7

EX #57 LINE MODE: Shift SET-UP 2

Key in operation	Display
CA Abs	Abs(▮ 0
Apps 7) =	MatAns:2x2 [0.0476 0.1904] [0.0714 0.1904] 1.7

EX #58 LINE MODE: Shift SET-UP 2

Key in operation	Display
MODE 8 1 2	VctA:2 [0] 0
8 = 5 =	VctA:2 [8] 5
CA Apps 1 2 2	VctB:2 [0] 0
7 = 3 =	VctB:2 [7] 3
CA Apps 3 −	VctA-▮ 0
Apps 4 =	VctAns:2 [2] 1

EX #59

LINE MODE: Shift SET-UP 2

Key in operation	Display
CA Apps 1 3 1	VctC:3 [0 0] 0
4 = 5 = (−) 6 =	VctC:3 [4 5 -F] -6
CA Apps 5 × 5 =	VctANS:3 [25 -30] 20

EX #60

LINE MODE: Shift SET-UP 2

Key in operation	Display
CA Apps 1 1 1	VctA:3 [0 0] 0
4 = 5 = (−) 6 =	VctA:3 [4 5 -F] -6
CA Apps 1 2 1	VctB:3 [0 0] 0
(−) 7 = 8 = 9 =	VctB:3 [-7 8 -F] 9
CA Apps 3	VctA 0
Apps 8	VctA-B 0
Apps 4 =	VctA-VctB -42

EX #61

LINE MODE: Shift SET-UP 2

Key in operation	Display
CA Apps 1 1 1	VctA:3 [0 0] 0
4 = 5 = (−) 6 =	VctA:3 [4 5 6] -6
CA Apps 1 2 1	VctB:3 [0 0] 0
(−) 7 = 8 = 9 =	VctB:3 [-7 8 9] 9
CA Apps 3 ×	VctA×4 0
Apps 4 =	VctAns:3 [6 67] 93

EX #62

LINE MODE: Shift SET-UP 2

Key in operation	Display
CA Apps 1 3 1	VctA:3 [0 0] 0
4 = 5 = (−) 6 =	VctA:3 [4 5 6] -6
CA Abs Apps 5) =	Abs(VctC) 8.774964387

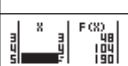
EX #63

LINE MODE: Shift SET-UP 2

Key in operation	Display
CA Apps 1 1 1	VctA:3 [0 0] 0
(−) 1 = 0 = 1 =	VctA:3 [-1 0] 1
CA Apps 1 2 1	VctB:3 [0 0] 0
1 = 2 = 0 =	VctB:3 [1 2] 0
CA Apps 3 Apps 8 Apps 4 =	VctA-VctB -1
÷ (Abs Apps 3) × Abs Apps 4) =	Ans÷(Abs(VctA)×▷ -0.316227766
Shift cos⁻¹ Ans) = Apps 3 × Apps 4 =	VctAns:3 [1 -2] -2
Abs Apps 7) = Apps 7 ÷ Ans =	VctAns:3 [0.3333 -0.666] -2.3

EX #64

MATHEMATICS MODE: Shift SET-UP 1

Key in operation	Display
MODE 6	f(x)=
Alpha X Shift x^2 + 3 Alpha X x^2 − 2 Alpha X	f(x)= X^3+3X^2-2X
= = = =	
▼ ▼ ▼ ▼	

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