User Manual
Interesting Calculator version 1.2.5_TAPE

Description of calculator buttons (line by line, starting at the top left).
Square (x^2), Square Root (√x), Exponentiation (x^y), Nth Root ($^y\sqrt{x}$), Change Sign (+/-), Inverse (1/x)
Sine (Sin), Cosine (Cos), Tangent (Tan), Convert to Degrees (Deg), Convert to Radians (Rad), Convert to Gradians ((Grad)
Inverse Sine (Sin^{-1}), Inverse Cosine (Cos^{-1}), Inverse Tangent (Tan^{-1}), Pi (π), Memory 1 (Mem1), Memory 2 (Mem2)
Natural Antilogarithm (e^x), Common Antilogarithm (10^x), Natural Logarithm (Ln), Logarithm (Log), Memory 3 (Mem3), Memory 4 (Mem4)
Scientific Notation (Sci), Percent (%), Percentage Change (Δ%), Absolute (ABS), Memory Recall (MR) Divide (/)
Round to Whole Number (Rnd), Seven (7), Eight (8), Nine (9), Memory Cancel (MC), Multiply (Times) (*)
Modulus (Mod), Four (4), Five (5), Six (6), Factorial (n!), Subtract (Minus) (-)
Number of Decimal Places (Dec), One (1), Two (2), Three (3), Convert to Floating-Point number (Convert to Floating-Pt)
Random Number (Ran), Zero (0), Decimal Point (.), Backspace (←), Clear (Clear), Equal (=).
Add Blank Line to Tape (Add Blank Line), Clear Last Line on Tape (Clear Last Line) , Clear Entire Tape (Clear Tape), Scroll Tape, Scroll Up Tape (^), Scroll Down Tape (v)

Examples of calculations (Starting at top left)
'**x^2**' - Input '12', press 'x^2' button, calc. display changes to '144'.
'**√x**' - Input '144', press '√x' button, calc. display changes to '12'.
'**x^y**' - Input '12', press 'x^y' button, input '2', press '=', calc. display changes to '144'.
'**$^y\sqrt{x}$**', – Input '144', press '$^y\sqrt{x}$' button, input '2', press '=', calc. display changes to '12'.
'**+/-**' - Input '12", press '+/-' button, calc. display changes to '-12'.
'**1/x**' - Input '12', press '1/x' button, calc. display changes to '0.083333333'.
'**Sin**' - Input '30', press 'Sin' button, calc. display changes to '0.5'.
'**Cos**' - Input '30', press 'Cos' button, calc. display changes to '0.866025404'.
'**Tan**' - Input '30', press 'Tan' button, calc. display changes to '0.577350269'.
'**Deg**' - Input '30', press 'Rad' button, calc.display changes to '0.523598776', press 'Deg' button, calc. display changes to '30.000000023°'.
'**Rad**' - Input '30', press 'Rad' button, calc. display changes to '0.523598776'.
'**Grad**' - Input '30', press 'Grad' button, calc. display changes to '33.3333333'.
'**Sin^{-1}**' - Input '0.5', press 'Sin^{-1}' button, calc. display changes to '30.0000000'.
'**Cos^{-1}**' - Input '0.866025404', press 'Cos^{-1}' button, calc. display changes to '29.999999975'.
'**Tan^{-1}**' - Input '0.577350269', press 'Tan^{-1}' button, calc. display changes to '29.999999992'.
'**π**' - Press 'π' button, calc. display changes to '3.141592654'.

‘**Mem1**’ - Input ‘11’, press ‘Mem1’ button, in calc. display ‘11’.
‘**Mem2**’ - Input ‘22’. press ‘Mem2’ button, in calc. display ‘22’.
‘**e^x**’ - Input ‘3’, press ‘e^x’ button, calc. display changes ‘20.085536923’.
‘**10^x**’ - Input ‘3’, press ‘10^x’ button, calc. display changes to ‘1,000.0’.
‘**Ln**’ - Input ‘3’ press ‘Ln’ button, calc. display changes to ‘1.098612289’.
‘**Log**’ - Input ‘3’, press ‘Log’ button, calc. display changes to ‘0.477121255’.
‘**Mem3**’ - Input ‘33’, press ‘Mem3’ button, in calc. display ‘33’.
’**Mem4**’ - Input ‘44’ press ’Mem4’ button, in calc. display ‘44’.
‘**Sci**’ - Input ‘123654789’, press ‘Sci’ button, input ‘3’, press ‘=’ button, calc. display changes to ‘1.237e+08’.
‘**%**’ - Input ‘150’, press ‘%’, input ‘25’, press ‘=’ button, calc. display changes to ‘37.5’.
‘**Δ%**’, - Input ‘150’, press ‘Δ%’, input ‘225’, press ‘=’ button, calc. display changes to 50.0000000’.
‘**ABS**’ - Input ‘-12’, press ‘ABS’ button, calc. display changes to ‘12’.
‘**MR**’ - Press ‘MR’ button, press ‘3’, calc. display changes to ‘33’.
‘***/***’ - Input ‘88’. Press ‘/’ button, input ‘3’ press ‘=’, calc. display changes to ‘29.333333333’.
‘**Rnd**’ - Input ‘123.654’, press ‘Rnd’ button, input ‘1’, press the ‘=’ button and the calc. display updates to '123.7'.
‘**7**’ - Input ‘7’, calc. display changes to ‘7’.
‘**8**’ - Input ‘8’, calc. display changes to ‘8’.
‘**9**’ - Input ‘9’, calc. display changes to ‘9’.
‘**MC**’ - Press ‘MC’ button and input ‘4’, calc. display clears.
‘***’ - Input ‘9’, press ‘*’ button, input ‘3’, press ‘=’ button, calc. display changes to ‘27’.
‘**Mod**’ - Input ‘22’, press ‘Mod’ button. Input ‘3’, press ‘=’ button, calc. display changes to ‘1’.
‘**4**’ - Input ‘4’, calc. display changes to ‘4’.
‘**5** - Input ‘5’, calc. display changes to ‘5’.
‘**6**’ - Input ‘6’, calc. display changes to ‘6’.
‘**n!**’ - Input ‘5’, press ‘n!’ button, calc. display changes to ‘120’.
‘**-**’ - Input ‘8’, press ‘-’ button, input ‘3’, press ‘=’, calc. display changes to ‘5’.
‘**Dec**’ - Input ‘3’, press ‘Dec’ button, calc. display clears (press the ’π’ button and the calc. display changes to ‘3.142’.
‘**1**’ - Input ‘1’, calc. display changes to ‘1’.
‘**2**’ - Input ‘2’, calc. display changes to ‘2’.
‘**3**’ - Input ‘3’, calc. display changes to ‘3’.
‘**Convert to Floating-Pt**’ – Input ‘3.584912846e+9’, press the ‘Convert to Floating-Pt’ button, calc. display changes to ‘3.584912846e+9 Fully Expanded: 3584912846’.
‘**+**’ - Input ‘5’, press ‘+’ button, input ‘7’, calc. display changes to ‘12’.

‘**Ran**’ - Press ‘Ran’ button, calc. display changes to ‘Press '=' or input seed & press '=' ‘, press ‘=’ button, calc. display changes to ‘0.988267375’ or any 9 decimal place number value less than 1. Or, press ‘Ran’ button, calc. display changes to ‘Press '=' or input seed & press '=' ‘, input ‘3’ (seed), press the ‘=’ button and the calc. display changes to a ‘1.379646271’ or any random number.
‘**0**’ - Input ‘0’, calc. display changes to ‘0’.
‘**2**’ - Input ‘2’. press ‘.’ button, input ‘5’, calc. display changes to ‘2.5’.
‘←’ - Input ‘34’, press ‘←’, calc. display change to’3’.
‘**Clear**’ - Input ‘22’. press ‘Clear’ button, calc. display clears.
‘**=**’ - Input ‘4’, press ‘+’ button, input ‘5’, press ‘=’, calc. display changes to ‘9’.
‘**Add Blank Line**’ – Press the ‘Add Blank Line’ button and a blank line is added as the last line on the tape.
‘**Clear Last Line**’ – Press the ‘Clear Last Line’ button and the last line of characters on the tape are eliminated.
‘**Clear Tape**’ – Press the ‘Clear Tape’ button and all the characters on the tape are eliminated.
‘**Scroll Tape**’ – This button is for informational purposes only and does not perform any function when pressed.
‘^’ – Press ‘^’ button and the lines of characters on the tape move closer to the first line on the tape.
‘**v**’ – Press the ‘v’ and the lines of characters on the tape move closer to the last line on the tape.

Decimal Places
The **'Dec'** button controls the number of decimal places displayed for both floating-point and scientific notation numbers. By default, the calculator displays 9 decimal places, but this can be adjusted to any value between 0 and 23.
Example: ‘Dec’ - Input ‘3’, press the 'Dec' button, and all displayed numbers—both inputs and results—will now be rounded to 3 decimal places globally.
Example: ‘π = 3.142’ or ‘987456321 dec 3 = 9.875e+8’

Accuracy of Very Large Number Calculations
Automatic Scientific Notation for Large Results
Some functions, such as square root and exponentiation, maintain accuracy up to the user-defined decimal places. However, when the result exceeds 10^{11} (100 billion), it is automatically displayed in scientific notation for better readability. The displayed value is rounded based on the selected decimal precision, but internal calculations retain full precision.

Accuracy of Very Large Number Calculations (continued)

Manual Conversion to Scientific Notation

When converting numbers to scientific notation manually, users can specify their desired decimal precision, and the calculator formats the result accordingly. This ensures users have control over how large numbers are represented.
Example: 9999999999999999 dec 5 = 10.00000e+15

Expanding Scientific Notation to Floating-Point Numbers

When converting from scientific notation back to a standard floating-point number, the calculator maintains high precision (up to 310 digits) to ensure accuracy. However, due to the limits of floating-point representation, extremely large or small numbers may experience minor rounding adjustments, which are negligible for most practical applications.
Example:
9.876543210e+25 Fully Expanded: 98765432100000000000000000

Copy and Paste

The characters in the calculator display can be copied & pasted into a document.
The characters on the tape can also be copied & pasted into a document.
Numeric values can be pasted directly into the calculator and used in calculations. (Examples: ‘9,999,999,999,999,999,999,999’ or ‘1.068647458e+13’ can be pasted into the calculator display and used for subsequent calculations.