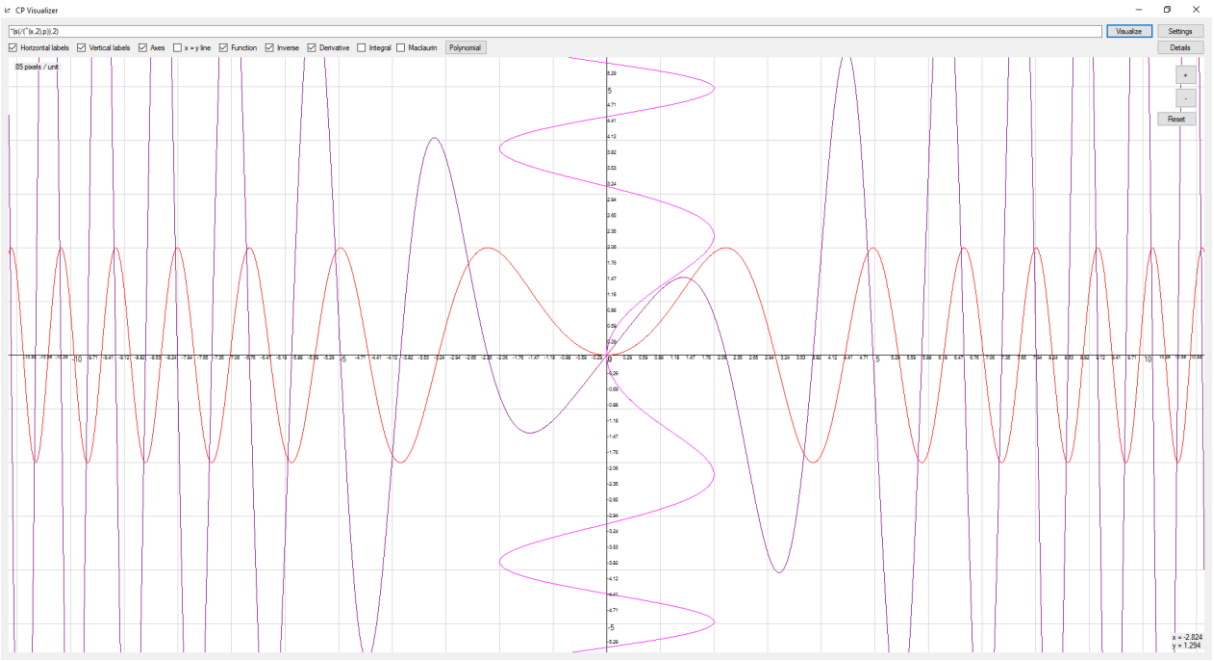
CVISUALIZER



Supported input
x
0..9
other natural numbers
real numbers like -4.2 and 987.654
A + B
A * B
A - B
A / B
A^B
sin(A)
cos(A)
exp(A) aka e^A
ln(A)
A!
π

Functions – parsed in prefix notation, graphed and outputted in infix notation with their binary trees in prefix notation.

Inverse functions - graphed

Function derivatives – graphed and outputted in infix notation with their binary trees in prefix notation, 2 algorithms – analytical and Newton's difference quotient

Function integrals – graphed and showing calculated Riemann sum

Maclaurin Series – graphed for given terms and outputted in infix notation with their binary trees in prefix notation, 2 algorithms – analytical and Newton's difference quotient

Polynomials – graphed, inputted by mouse clicks, and outputted in infix notation with their binary trees in prefix notation

➢ Useful features:

- User-friendly UI
- Customizable output (enabling and disabling of x or y-axes, x=y line, vertical or horizontal labels, function, inverse function, function derivative, function integral, Maclaurin approximation and polynomials)
- Keyboard shortcuts, easy zoom in and zoom out via mouse scroll, repositioning of graph by mouse drag or keyboard arrows, resetting
- Displaying of scale
- Current (x,y) coordinates by mouse position
- Line label interval frequency according to the current scale
- Input validation, white space and case-insensitive
- Exporting graphs and binary trees to PNG
- Settings – changing algorithms for derivatives and Maclaurin polynomials, precision
- Possible to see the original binary trees and expressions, and the simplified ones
- Full qualifiers (sin for s, cos for c, ln for l, exp for e, pi for p, multi-digit number parsing without enclosing in "r" or "n")

Simplification

- `1 * x`, `x + 0`, x^1, etc.
- 2*x + 3*x, 2*x – 3*x, 2*x * 3*x, 2*x –/3*x, x + 2*x, x - 2*x,
- x * 2*x, x / 2*x, etc.
- 2*p + 3*p, 2*p – 3*p, 2*p * 3*p, 2*p –/3*x, p + 2*p, p - 2*p, etc.
- p * 2*p, p / 2*p, etc.
- `(x + 3) + 5`
- e^0, $e^{\ln a}$, $e^a \cdot e^b$, e^a / e^b, $(e^a)^b$
  where `a` and `b` can be any function
- `ln 1`, `ln e`, `ln a + ln b`, `ln a - ln b`, $\ln a^b$, where `a` and `b` can be any function
- $a + b$, $a - b$, $a \cdot b$, a / b, a^b, where `a` and `b` are constants

- sin/cos, cos/sin, sin/cos / cos/sin, etc.

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