derivative

Examples Random

Assuming "derivative" refers to a computation | Use as a general topic or referring to a mathematical definition or a word instead

function to differentiate: 3^x/log x

Also include: differentiation variable

Derivative:

Approximate form | Step-by-step solution

$$\frac{d}{dx}\left(\frac{3^x}{\log(x)}\right) = \frac{3^x\,(x\log(3)\log(x)-1)}{x\log^2(x)}$$

$\log(x)$ is the natural logarithm

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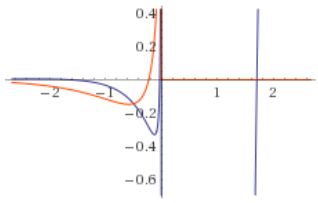
Plots:

Complex-valued plot ▼

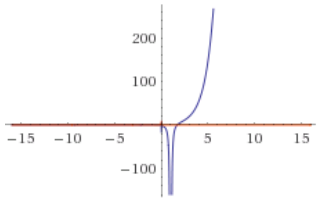


(x from −2.7 to 2.7)

real part
imaginary part

Enable interactivity

Complex-valued plot ▼



(x from −16 to 16)

real part
imaginary part

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Alternate form:

$$3^x\left(\frac{\log(3)}{\log(x)} - \frac{1}{x\log^2(x)}\right)$$

Expanded form:

$$\frac{3^x\log(3)}{\log(x)} - \frac{3^x}{x\log^2(x)}$$

Root:

Approximate form

$$x = e^{W\left(\frac{1}{\log(3)}\right)}$$

$W(z)$ is the product log function

Properties as a real function:

Domain:

$\{x \in \mathbb{R} : x > 1 \text{ or } 0 < x < 1\}$

Range:

$\mathbb{R}$ (all real numbers)

Surjectivity:

surjective onto $\mathbb{R}$

$\mathbb{R}$ is the set of real numbers

Series expansion at x=0:

$$-\frac{1}{x\log^2(x)}+\frac{\log(3)\,(\log(x)-1)}{\log^2(x)}+\frac{x\log^2(3)\,(2\log(x)-1)}{2\log^2(x)}+O\left(x^2\right)$$

(generalized Puiseux series)

Big-O notation »

Indefinite integral:

Step-by-step solution

$$\int\frac{3^x\,(-1+x\log(3)\log(x))}{x\log^2(x)}\,dx=\frac{3^x}{\log(x)}+\text{constant}$$

Differential geometric curves:

(requires interactivity)

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Standard computation time exceeded... Try again with additional computation time »

Related Queries:

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- integrate 3^x/(log(x)) dx
- tangent line of y = 3^x/(log(x)) at x = pi/4
- series of 3^x/(log(x)) at x = 0