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: e^((x-1)/(x+1))

Also include: differentiation variable

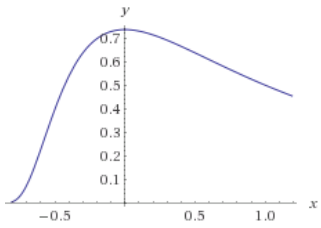
Derivative:

Approximate form | Step-by-step solution

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

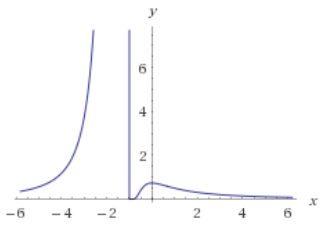
Share

Plots:



(x from −0.8 to 1.2)

Enable interactivity



(x from −5.8 to 6.2)

Enable interactivity

Alternate form:

$$\frac{2\,e^{\frac{x}{x+1}-\frac{1}{x+1}}}{(x+1)^2}$$

Roots:

(no roots exist)

Properties as a real function:

Domain:

$$\{x \in \mathbb{R} : x \neq -1\}$$

Range:

$$\{y \in \mathbb{R} : y > 0\}$$ (all positive real numbers)

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

Series expansion at x=0:

$$\frac{2}{e} - \frac{2x^2}{e} + \frac{8x^3}{3e} - \frac{2x^4}{e} + O(x^5)$$

(Taylor series)

Big-O notation »

Series expansion at x=∞:

$$\frac{2e}{x^2} - \frac{8e}{x^3} + \frac{22e}{x^4} - \frac{152e}{3x^5} + O\left(\left(\frac{1}{x}\right)^6\right)$$

(Laurent series)

Big-O notation »

Indefinite integral:

Approximate form | Step-by-step solution

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

Local maximum:

Approximate form

$$\max\left\{\frac{2e^{\frac{x-1}{x+1}}}{(x+1)^2}\right\} = \frac{2}{e} \text{ at } x = 0$$

Limit:

$$\lim_{x\to\pm\infty} \frac{2e^{\frac{-1+x}{1+x}}}{(1+x)^2} = 0$$

Differential geometric curves:

(requires interactivity)

Enable Interactivity

POWERED BY THE **WOLFRAM LANGUAGE**

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

Related Queries:

- = limit of (e^(((eps+x)-1)/((eps+x)+1))/e^((…
- = limit of e^((x-1)/(x+1)) as x -> +infinity
- = limit of e^((x-1)/(x+1)) as x -> -infinity
- = series of e^((x-1)/(x+1)) at x = 0