



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:

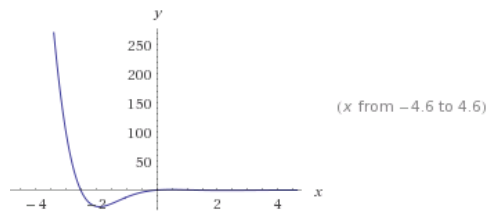
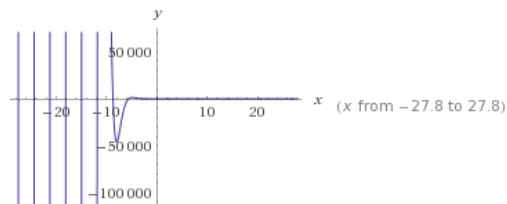
Also include:

Derivative:

[Step-by-step solution](#)

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

Plots:

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Alternate forms:

[More](#)

$$2e^{-x} ((1-x) \sin(x) + x \cos(x))$$

$$e^{-x} (2 - 2x) \sin(x) + 2e^{-x} x \cos(x)$$

$$2e^{-x} \sin(x) - 2e^{-x} x \sin(x) + 2e^{-x} x \cos(x)$$

Numerical roots:

[More digits](#)

$$x \approx -8.69371127497694...$$

$$x \approx -5.57984147784894...$$

$$x \approx -2.52025542588455...$$

$$x = 0$$

$$x \approx 1.32842662320324...$$

$$x \approx 4.06628479803594...$$

$$x \approx 7.14370111864923...$$

$$x \approx 10.2613537997497...$$

Property as a real function:

Domain:

 \mathbb{R} (all real numbers) \mathbb{R} is the set of real numbers

Series expansion at x=0:

$$4x-6x^2+\frac{8x^3}{3}-\frac{2x^5}{5}+O(x^6)$$

(Taylor series)

Big-O notation »

Indefinite integral:

Step-by-step solution

$$\int \frac{2\left(x\cos(x)+\sin(x)-x\sin(x)\right)}{e^x}dx=2e^{-x}x\sin(x)+\text{constant}$$

Differential geometric curves:

(requires interactivity)

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Differential equation solution curve families:

(requires interactivity)

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Standard computation time exceeded...

Try again with additional computation time »

Related Queries:

◊ osculating circle of $(2x\sin(x))/e^x$

◊ series $(f(x+\epsilon)/f(x))^{1/\epsilon}$ at $\epsilon=0$

◊ continued fraction $(2x\sin(x))/e^x$

◊ limit of $((2(\epsilon+x)\sin(\epsilon+x))/e^{(\epsilon+x)})$

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