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: (x^2+2x+3)^3

Also include: differentiation variable

Derivative: Step-by-step solution

$$\frac{d}{dx}\left(\left(x^2+2x+3\right)^3\right) = 6\,(x+1)\left(x^2+2x+3\right)^2$$

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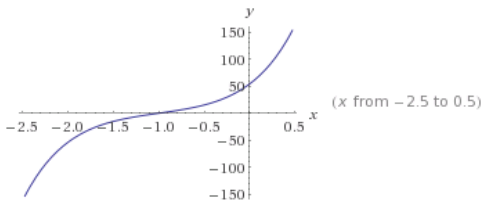
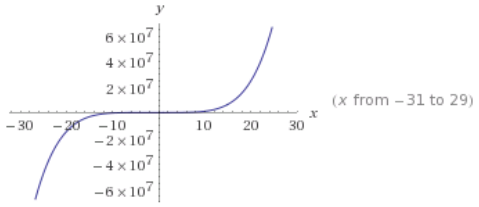
Plots:



(x from −2.5 to 0.5)

Enable interactivity



(x from −31 to 29)

Enable interactivity

Alternate forms:

$$x\,(x\,(x\,(x\,(6\,x+30)+84)+132)+126)+54$$

$$6\,(x+1)\,(x\,(x+2)+3)^2$$

$$6\left(-i\,x+\sqrt{2}\,-i\right)^2\left(i\,x+\sqrt{2}\,+i\right)^2(x+1)$$

Alternate form assuming x>0:

$$6\,x\left(x^2+2\,x+3\right)^2+6\left(x^2+2\,x+3\right)^2$$

Expanded form:

$$6\,x^5+30\,x^4+84\,x^3+132\,x^2+126\,x+54$$

Real root: Step-by-step solution

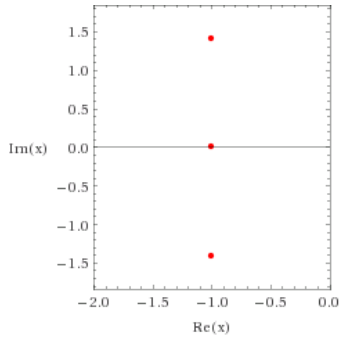
$$x=-1$$

Complex roots: Approximate forms Step-by-step solution

$$x=-1-i\sqrt{2}$$

$$x=-1+i\sqrt{2}$$

Roots in the complex plane:



Polynomial discriminant:

$$\Delta = 0$$

Properties as a real function:

Domain:

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

Range:

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

Bijectivity:

bijective from its domain to $\mathbb{R}$

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

Indefinite integral: Step-by-step solution

$$\int 6\,(1+x)\left(3+2\,x+x^2\right)^2\,dx = x^6+6\,x^5+21\,x^4+44\,x^3+63\,x^2+54\,x + \text{constant}$$

Differential geometric curves:

(requires interactivity) Enable Interactivity

Differential equation solution curve families:

(requires interactivity) Enable Interactivity

Inverse iterations:

(requires interactivity) Enable Interactivity

POWERED BY THE **WOLFRAM LANGUAGE**

Related Queries:

- = d/dx((x^2+2 x+3)^3)^((x^2+2 x+3)^3)
- = series (f(x+eps)/f(x))^(1/eps) at eps = 0
- = osculating circle of (x^2+2 x+3)^3
- = what are you going to do with all that ju…