

Домашнее задание по математическому анализу

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Упростить следующие выражения:

1

Input:

$$(2 * \sin(x) * \cos(x) - \sin(2 * x)) [x=123]$$

Step #1

$$(2 \cdot \sin(x) \cos(x) - \sin(2 \cdot x))|_{x=123}$$

Step #2

$$0.81675999962280854128 - \sin(246)$$

Step #3

$$0$$

Result:

$$0$$

2

Input:

$$F(x) [x=0]$$

Step #1

$$F(x)|_{x=0}$$

Step #2

$$F(0)$$

Result:

$$F(0)$$

3

Input:

$$F(F(x)) [x=0]$$

Step #1

$$F(F(x))|_{x=0}$$

Step #2

$$F(F(0))$$

Result:

$$F(F(0))$$

4

Input:

x^2

Step #1

$$(x^2)''$$

Step #2

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

Step #3

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

Step #4

$$-\frac{2}{x^0} + \frac{1^2 \cdot 4}{x^{(2-2)}}$$

Step #5

$$\frac{4}{x^0} - 2$$

Step #6

$$2$$

Result:

$$2$$

5

Input:

$((x+1)*(x+2)*(x+3)*(x+4))$

Step #1

$$((x+1)(x+2)(x+3)(x+4))'_x$$

Step #2

$$(x+4)(x+2)(x+3) + (x+1)(x+4)(x+3) + (x+1)(x+2)(x+4) + (x+1)(x+2)(x+3)$$

Result:

$$(x+4)(x+2)(x+3) + (x+1)(x+4)(x+3) + (x+1)(x+2)(x+4) + (x+1)(x+2)(x+3)$$

6

Input:

$((x+1)*(x+2)*(x+3)*(x+4))$ [x=-3]

Step #1

$$((x+1)(x+2)(x+3)(x+4))'_x \Big|_{x=-3}$$

Step #2

$$0 + 0 + 2 + 0$$

$$2$$

Step #3

2

Result:

2

7

Input:

$(3 \cdot x - 7)^{10}$

Step #1

$$\left((3 \cdot x - 7)^{10} \right)'_x$$

Step #2

$$\left(0 \cdot \log(x \cdot 3 - 7) + \frac{10 \cdot 3}{(x \cdot 3 - 7)} \right) (x \cdot 3 - 7)^{10}$$

Step #3

$$\frac{30}{(x \cdot 3 - 7)} (x \cdot 3 - 7)^{10}$$

Step #4

$$\frac{1^{10} \cdot 30}{(x \cdot 3 - 7)^{(1-10)}}$$

Step #5

$$(x \cdot 3 - 7)^{-((-9))} \cdot 30$$

Step #6

$$(x \cdot 3 - 7)^9 \cdot 30$$

Result:

$$(x \cdot 3 - 7)^9 \cdot 30$$

8

Input:

$(a + b \cdot x)^c$

Step #1

$$\left((a + bx)^c \right)'_x$$

Step #2

$$\left(0 \cdot \log(a + bx) + \frac{cb}{(a + bx)} \right) (a + bx)^c$$

Step #3

$$\frac{cb}{(a + bx)} (a + bx)^c$$

Step #4

$$\frac{cb1^c}{(a + bx)^{(1-c)}}$$

3

Step #5

$$cb(a+bx)^{-((-c+1))}$$

Step #6

$$cb(a+bx)^{(c-1)}$$

Result:

$$cb(a+bx)^{(c-1)}$$

9

Input:

$$(2 * x^2 + (x^2 + 1)^{0.5})^{0.5}$$

Step #1

$$\left(\sqrt{2 \cdot x^2 + \sqrt{x^2 + 1}}\right)'_x$$

Step #2

$$\left(0 \cdot \log(x^2 \cdot 2 + \sqrt{x^2 + 1}) + \frac{0.5 \cdot \left(x^{-((-1))} \cdot 4 + \frac{x^1}{(x^2+1)} \sqrt{x^2 + 1}\right)}{(x^2 \cdot 2 + \sqrt{x^2 + 1})}\right) \sqrt{x^2 \cdot 2 + \sqrt{x^2 + 1}}$$

Step #3

$$\frac{\left(x \cdot 4 + \frac{x}{\sqrt{x^2+1}}\right) \cdot 0.5}{(x^2 \cdot 2 + \sqrt{x^2 + 1})} \sqrt{x^2 \cdot 2 + \sqrt{x^2 + 1}}$$

Step #4

$$\frac{\left(x \cdot 4 + \frac{x}{\sqrt{x^2+1}}\right) \sqrt{1} \cdot 0.5}{(x^2 \cdot 2 + \sqrt{x^2 + 1})^{(1-0.5)}}$$

Step #5

$$\frac{\left(x \cdot 4 + \frac{x}{\sqrt{x^2+1}}\right) \cdot 0.5}{\sqrt{x^2 \cdot 2 + \sqrt{x^2 + 1}}}$$

Result:

$$\frac{\left(x \cdot 4 + \frac{x}{\sqrt{x^2+1}}\right) \cdot 0.5}{\sqrt{x^2 \cdot 2 + \sqrt{x^2 + 1}}}$$

10

Input:

$$\cos(1/x)$$

Step #1

$$\cos\left(\frac{1}{x}\right)'_x$$

Step #2

$$-\left(\frac{1}{x^{(1+1)}1^1}\right) - \sin\left(\frac{1}{x}\right)$$

Step #3

$$\frac{1}{x^2} \sin\left(\frac{1}{x}\right)$$

Step #4

$$\frac{\sin\left(\frac{1}{x}\right)}{x^2}$$

Result:

$$\frac{\sin\left(\frac{1}{x}\right)}{x^2}$$

11

Input:

$$\log(\log(x/2))'$$

Step #1

$$\log\left(\log\left(\frac{x}{2}\right)\right)'_x$$

Step #2

$$0.5 \cdot \frac{1}{id}(x \cdot 0.5) \frac{1}{id}(\log(x \cdot 0.5))$$

Step #3

$$\frac{1}{\log(x \cdot 0.5)} \frac{2}{x} \cdot 0.5$$

Step #4

$$\frac{1}{\log(x \cdot 0.5) x}$$

Result:

$$\frac{1}{\log(x \cdot 0.5) x}$$

12

Input:

$$\exp(-x^2/2)'$$

Step #1

$$\exp\left(\frac{-x^2}{2}\right)'_x$$

Step #2

$$-\left(\frac{1^2}{x^{(1-2)}}\right) \exp(-(x^2 \cdot 0.5))$$

Step #3

$$-\left(x^{-((-1))} \exp(-(x^2 \cdot 0.5))\right)$$

Step #4

$$- (x^1 \exp (- (x^2 \cdot 0.5)))$$

Step #5

$$- (x \exp (- (x^2 \cdot 0.5)))$$

Result:

$$- (x \exp (- (x^2 \cdot 0.5)))$$

13

Input:

$$(x^x)'$$

Step #1

$$(x^x)'_x$$

Step #2

$$\left(1 \cdot \log(x) + \frac{x \cdot 1}{x}\right) x^x$$

Step #3

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

Step #4

$$(\log(x) + x^0) x^x$$

Step #5

$$(\log(x) + 1) x^x$$

Result:

$$(\log(x) + 1) x^x$$

14

Input:

$$((-1)^{0.5})^2$$

Step #1

$$(\sqrt{-1})^2$$

Step #2

$$\sqrt{-1}^2$$

Step #3

$$-1$$

Result:

$$-1$$

15

Input:

some shit

Result:

Упс, что-то пошло не так... Eoln: Bad token at pos 5

16

Input:

1 + 1

Step #1

1 + 1

Step #2

2

Result:

2

17

Input:

x,,,,,,,,,,,,,,,,,,,,,

Step #1

$x \begin{matrix} \text{////////////////////} \\ \text{xxxxxxxxxxxxxxxxxxxxxx} \end{matrix}$

Step #2

0

Result:

0

18

Input:

exp(-x^2)''''

Step #1

$\exp(-x^2) \begin{matrix} \text{////} \\ \text{xxxx} \end{matrix}$

Step #2

$$-\frac{\exp(-x^2) 1^{--(-3))} \cdot 24}{x^{(1--(-3))}} + \frac{x^{(3-1+2)} \exp(-x^2) 1^2 \cdot 16}{1^{(1-2)}} - \frac{x^{(2+1-1)} 1^{(1-1)} \exp(-x^2) \cdot 8}{1^1} \\ + \frac{\exp(-x^2) 1^{--(-1))} \cdot 4}{x^{(1--(-1))}} \cdot 3 + 0 - \frac{x^{(1-1+2)} \exp(-x^2) 1^2 \cdot 16}{1^{(1-2)}}$$

Step #3

$$-x^{-((-2))} \exp(-x^2) \cdot 24 + x^4 \exp(-x^2) \cdot 16 - x^2 \exp(-x^2) \cdot 8 \cdot 3 + \frac{\exp(-x^2) \cdot 12}{x^0} - 0$$

Step #4

$$-x^2 \exp(-x^2) \cdot 24 \cdot 2 + x^4 \exp(-x^2) \cdot 16 - 0 + \exp(-x^2) \cdot 12$$

Step #5

$$-x^2 \exp(-x^2) \cdot 48 + x^4 \exp(-x^2) \cdot 16 + \exp(-x^2) \cdot 12$$

Result:

$$-x^2 \exp(-x^2) \cdot 48 + x^4 \exp(-x^2) \cdot 16 + \exp(-x^2) \cdot 12$$

19

Input:

$$\log(x*y)'_{x'}_{y'}$$

Step #1

$$\log(xy)''_{xy}$$

Step #2

$$\frac{1}{xy} - yx \frac{1}{x^2 y^2}$$

Step #3

$$\frac{1}{xy} - \frac{y^{(1-2)} x^{(1-2)}}{1^{(2+2)} 1^2}$$

Step #4

$$\frac{1}{xy} - \frac{1}{y^{-((-1))} x^{-((-1))}}$$

Step #5

$$\frac{1}{xy} - \frac{1}{y^1 x^1}$$

Step #6

$$\frac{1}{xy} \cdot 0 - 0$$

Step #7

$$0$$

Result:

$$0$$

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