

Funktsiooni tuletiste leidmine
(tuleiste tabel + diferentseerimisreeglid nr 1 ja 4)

Näide 12

$$(x^5)' = 5 \cdot x^{5-1} = 5x^4$$

Näide 13

$$\left(\frac{1}{x^5}\right)' = (x^{-5})' = -5 \cdot x^{-5-1} = -5x^{-6} = -\frac{5}{x^6}$$

Näide 14

$$(7x^4)' = 7(x^4)' = 7 \cdot 4 \cdot x^{4-1} = 28x^3$$

Näide 15

$$\begin{aligned}(2x^3 - 4x^2 + 3x - 5)' &= (2x^3)' - (4x^2)' + (3x)' - 5' = \\ &= 2(x^3)' - 4(x^2)' + 3x' - 0 = \\ &= 2 \cdot 3 \cdot x^{3-1} - 4 \cdot 2 \cdot x^{2-1} + 3 \cdot 1 = \\ &= 6x^2 - 8x + 3\end{aligned}$$

Näide 16

$$\begin{aligned}(3x + \sin(x) - 4 \cos(x))' &= (3x)' + (\sin x)' - (4 \cos x)' = \\ &= 3x' + \cos x - 4(\cos x)' = \\ &= 3 \cdot 1 + \cos x - 4 \cdot (-\sin x) = \\ &= 3 + \cos x + 4 \sin x\end{aligned}$$

Näide 17

$$\begin{aligned}(\arcsin x - 2 \arctan x + \operatorname{arccot} x)' &= (\arcsin x)' - 2(\arctan x)' + (\operatorname{arccot} x)' = \\ &= \frac{1}{\sqrt{1-x^2}} - 2 \frac{1}{1+x^2} - \frac{1}{1+x^2} = \\ &= \frac{1}{\sqrt{1-x^2}} - 3 \frac{1}{1+x^2}\end{aligned}$$

Näide 18

$$(3 \ln x - 4e^x)' = 3(\ln x)' - 4(e^x)' = 3 \frac{1}{x} - 4e^x = \frac{3}{x} - 4e^x$$

Näide 19

$$\begin{aligned}y &= 2 \cdot x^3 + 4 \cdot x^2 - 5 \cdot x + 7 \\ y' &= 2 \cdot 3 \cdot x^2 + 2 \cdot 4 \cdot x^1 - 5 + 0 \\ &= 6 \cdot x^2 + 8 \cdot x - 5\end{aligned}$$

Näide 20

$$y = -7 + 5 \cdot x - \frac{5}{2} \cdot x^2 - 3 \cdot x^4$$

$$\begin{aligned} y' &= 0 + 5 - 2 \cdot \frac{5}{2} \cdot x^{2-1} - 3 \cdot 4 \cdot x^{4-1} \\ &= 5 - 5 \cdot x - 12 \cdot x^3 \end{aligned}$$

Näide 21

$$y = \frac{1}{5} \cdot x^{\frac{5}{2}} - \frac{1}{3} \cdot x^{\frac{3}{2}}$$

$$\begin{aligned} y' &= \frac{5}{2} \cdot \frac{1}{5} \cdot x^{\frac{5}{2} - \frac{2}{2}} - \frac{3}{2} \cdot \frac{1}{3} \cdot x^{\frac{3}{2} - \frac{2}{2}} \\ &= \frac{1}{2} \cdot x^{\frac{3}{2}} - \frac{1}{2} \cdot x^{\frac{1}{2}} \\ &= \frac{1}{2} \cdot (\sqrt{x^3} - \sqrt{x}) \end{aligned}$$

Näide 22

$$f(x) = e^x + x - 2$$

$$f'(x) = e^x + 1$$

Näide 23

$$y = 3x^{\frac{13}{7}} - 4x\sqrt{x} + \frac{7}{x^3}$$

$$\begin{aligned} y' &= \left(3x^{\frac{13}{7}} - 4x\sqrt{x} + \frac{7}{x^3} \right)' = \left(3x^{\frac{13}{7}} - 4x^{1,5} + 7x^{-3} \right)' = \\ &= \left(3x^{\frac{13}{7}} \right)' - \left(4x^{1,5} \right)' + \left(7x^{-3} \right)' = 3 \left(x^{\frac{13}{7}} \right)' - 4 \left(x^{1,5} \right)' + 7 \left(x^{-3} \right)' = \\ &= 3 \cdot \frac{13}{7} x^{\frac{13}{7}-1} - 4 \cdot 1,5x^{1,5-1} + 7 \cdot x^{-3-1} = 3 \cdot \frac{13}{7} x^{\frac{6}{7}} - 4 \cdot 1,5x^{0,5} + 7 \cdot x^{-4} = \\ &= \frac{39}{7} x^{\frac{6}{7}} - 6\sqrt{x} + \frac{7}{x^4} \end{aligned}$$