

Diferencēšana.

Atrast y' !

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|---|--|
| 1. $y = \log_2^3(2x + 3)^2$ | Atbilde: $\frac{12}{\ln 2} \cdot \frac{\log_2^2(2x + 3)^2}{2x + 3}$ |
| 2. $y = \frac{1 + x^2 \operatorname{arctg} x^2}{\sqrt{1 + x^4}}$ | Atbilde: $\frac{2x \operatorname{arctg} x^2}{\sqrt{(1 + x^4)^3}}$ |
| 3. $y = 10^{\frac{x}{\log_3 x}}$ | Atbilde: $\frac{(\ln x - 1) \ln 10}{\ln x \log_3 x} 10^{\frac{x}{\log_3 x}}$ |
| 4. $y = \frac{2}{\sqrt{31}} \operatorname{arctg} \frac{4x - 5}{\sqrt{31}}$ | Atbilde: $\frac{1}{2x^2 - 5x + 7}$ |
| 5. $y = \frac{1}{\sqrt{2}} \operatorname{arctg} \frac{x^2 - 1}{\sqrt{2}x}$ | Atbilde: $\frac{x^2 + 1}{x^4 + 1}$ |
| 6. $y = \frac{1}{2} \operatorname{th} x + \frac{\sqrt{2}}{8} \ln \frac{1 + \sqrt{2} \operatorname{th} x}{1 - \sqrt{2} \operatorname{th} x}$ | Atbilde: $\frac{1}{1 - \operatorname{sh}^4 x}$ |
| 7. $y = \ln \operatorname{tg} \frac{x}{2} - \cos x \cdot \ln \operatorname{tg} x$ | Atbilde: $\sin x \cdot \ln \operatorname{tg} x$ |
| 8. $y = \frac{x}{2} (\sin \ln x + \cos \ln x)$ | Atbilde: $\cos \ln x$ |
| 9. $y = \frac{1}{2} \ln(1 + x^2) - \frac{1}{4} \ln(1 + x^4) - \frac{1}{2(1 + x^2)}$ | Atbilde: $\frac{2x}{(1 + x^2)^2(1 + x^4)}$ |
| 10. $y = \arcsin \frac{x^{2n} - 1}{x^{2n} + 1}$ | Atbilde: $-\frac{2n x ^n}{x(x^{2n} + 1)}$ |
| 11. $y = e^x \arcsin \sqrt{\frac{e^x}{e^x + 1}} + \operatorname{arctg} \sqrt{e^x} - \sqrt{e^x}$ | Atbilde: $e^x \cdot \arcsin \sqrt{\frac{e^x}{1 + e^x}}$ |
| 12. $y = \ln \sqrt{\frac{1 - \sin x}{1 + \sin x}}$ | Atbilde: $-\frac{1}{\cos x}$ |
| 13. $y = \frac{\operatorname{ch} x^2}{\operatorname{sh}^2 x^2} - \ln \operatorname{cth} \frac{x^2}{2}$ | Atbilde: $-\frac{4x}{\operatorname{sh}^3 x^2}$ |
| 14. $y = \sqrt{a^2 - x^2} + a^2 \arcsin \frac{x}{ a }$ | Atbilde: $2\sqrt{a^2 - x^2}$ |
| 15. $y = x - \ln \sqrt{1 + e^{2x}} + e^{-x} \operatorname{arctg} e^x$ | Atbilde: $-\frac{\operatorname{arctg} e^x}{e^x}$ |

16. $y = \log_2 x \cdot \log_x e + \log_2 x \cdot \ln 2$ Atbilde: $\frac{1}{x}, x > 0, x \neq 1.$
17. $y = x^{\frac{2}{\ln x}} - 2x^{\log_x e} \cdot e^{1+\ln x} + e^{1+\frac{2}{\log_x e}}$ Atbilde: $2e(x - e), x > 0, x \neq 1$
18. $y = x^{e^x}$ Atbilde: $e^x \cdot x^{e^x} \left(\frac{1}{x} + \ln x \right)$
19. $y = x^{x^x}$ Atbilde: $x^{x^x} \cdot x^{x-1} (x \ln^2 x + x \ln x + 1)$
20. $y = (\operatorname{ch} x)^{e^x}$ Atbilde: $(\operatorname{ch} x)^{e^x} \cdot e^x (\ln \operatorname{ch} x + \operatorname{th} x)$

Atrast $y'(x_0)!$

21. $y = \frac{1+x-x^2}{1-x+x^2}$ $x_0 = 1$ Atbilde: -2
22. $y = 3 \cos 2x - \sqrt{1 - \sin 2x} (\sin x + \cos x)$ $x_0 = \frac{\pi}{6}$ Atbilde: $-2\sqrt{3}$
23. $y = \log_{\frac{1}{2}} \left(x - \frac{1}{2} \right)^2 + \log_2 \sqrt{4x^2 - 4x + 1}$ $x_0 = 0$ Atbilde: $\frac{2}{\ln 2}$
24. $y = \ln(1 + \sin^2 x) - 2 \sin x \cdot \operatorname{arctg} \sin x$ $x_0 = \frac{\pi}{2}$ Atbilde: 0
25. $y = \sqrt[3]{\operatorname{arctg} \sqrt[5]{\cos \ln^2 x}}$ $x_0 = 1$ Atbilde: 0
26. $y = 2^{\operatorname{tg} \frac{1}{x}}$ $x_0 = \frac{1}{\pi}$ Atbilde: $-\pi^2 \ln 2$
27. $y = (1+x)\sqrt{2+x^2} \sqrt[3]{3+x^3}$ $x_0 = 0$ Atbilde: $\sqrt[6]{72}$
28. $y = (\operatorname{ch} x)^{\operatorname{sh} x}$ $x_0 = 0$ Atbilde: 0
29. $y = \left(\frac{\sin x}{x} \right)^x$ $x_0 = \frac{\pi}{2}$ Atbilde: $-\left(\frac{\pi}{2} \right)^{-\frac{\pi}{2}} \left(1 + \ln \left(\frac{\pi}{2} \right) \right)$
30. $y = 2^{\log_4(x^2+x+1)}$ $x_0 = 1$ Atbilde: $\frac{\sqrt{3}}{2}$