

Ve vnitřních bodech definičního oboru spočtěte derivace funkcí:

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| 1. $\frac{ax+b}{cx+d}$ | 10. $\operatorname{arctg}\left(\frac{x}{\exp x+1}\right)$ |
| 2. $(\sin x)^{\cos x}$ | 11. $\frac{x^2+\sin x}{x^4+1}$ |
| 3. $\ln(x+\sqrt{x^2+1})$ | 12. $(\cos x)^{\sin x}$ |
| 4. $\operatorname{arctg} x + \operatorname{arctg} 1/x$ | 13. $(\ln x)^x$ |
| 5. x^{x^x} | 14. $\arccos\left(\frac{1}{1-x}\right)$ |
| 6. $\arcsin \frac{x}{\sqrt{x^2+1}}$ | 15. $\sqrt[3]{\frac{x+2}{x-3}}$ |
| 7. $\ln \sqrt{\frac{x+1}{x-1}}$ | 16. $\ln \sin x $ |
| 8. $\ln[\operatorname{tg}(x/2)]$ | 17. $\sqrt[3]{x^2+2x-3}$ |
| 9. $\sqrt{x-\sqrt{x}}$ | 18. $\operatorname{arccotg}\left(\frac{\exp x}{x+1}\right)$ |

Výsledky.

- $\frac{ad-cb}{(cx+d)^2}, x \neq -d/c.$
- $(\sin(x))^{\cos(x)} \left(-\sin(x) \ln(\sin(x)) + \frac{(\cos(x))^2}{\sin(x)}\right), x \in (2k\pi, (2k+1)\pi).$
- $\frac{1}{\sqrt{1+x^2}}, x \in R.$
- 0 – pozor, platí jen pro $x \neq 0.$
- $x^{x^x} \left(x^x (\ln(x) + 1) \ln(x) + \frac{x^x}{x}\right), x > 0.$
- $\frac{1}{x^2+1}, x \in R.$
- $-\frac{1}{(x-1)(x+1)}, |x| > 1.$
- $\frac{1}{\sin x}, x \in (2k\pi, 2k+1\pi).$
- $\frac{1}{4} \frac{2\sqrt{x-1}}{\sqrt{x-\sqrt{x}}\sqrt{x}}, x > 1.$
- $-\frac{-e^x-1+xe^x}{(e^x)^2+2e^x+1+x^2}, x \in R.$

11. $-\frac{2x^5-2x-\cos(x)x^4-\cos(x)+4x^3\sin(x)}{(x^4+1)^2}, x \in R.$
12. $(\cos(x))^{\sin(x)} \left(\cos(x) \ln(\cos(x)) - \frac{(\sin(x))^2}{\cos(x)} \right),$
 $x \in ((2k-1/2)\pi, (2k+1/2)\pi).$
13. $(\ln(x))^x \left(\ln(\ln(x)) + (\ln(x))^{-1} \right), x > 1.$
14. $\frac{-1}{|x-1|\sqrt{x^2-2x}}, x \in (-\infty, 0) \cup (2, \infty).$
15. $\frac{-5}{3(x-3)\sqrt[3]{(x+2)^2(x-3)}}, x \neq 3.$
16. $\frac{\cos x}{\sin x}, x \neq k\pi.$
17. $\frac{2(x+1)}{\sqrt[3]{x^2+2x-3}}, x \neq 1, -3; f'(-3) = -\infty, f'(1) = \infty.$
18. $-\frac{e^x x}{x^2+2x+1+(e^x)^2}, x \neq -1.$