Odpovědi na početní cvičení

2 **1.** $-\frac{1}{x^2}-\frac{4}{x^3}-\frac{9}{x^4}$ **2.** $2x-a-b$ **3.** $\sin^2 x=\frac{1+\cos 2x}{2}$ **4.** $\frac{5x\sqrt{x}}{2}-\frac{5}{3}\sqrt[3]{x^2}$
5. $1-\frac{3}{2}\sqrt{x}-\frac{1}{2\sqrt{x}}$ **6.** $x\operatorname{arc tg} x$ **7.** $2(x+2)(x+3)^2(3x^2+11x+9)$ **8.** $e^x(2x\sin x+x^2\cos x+x^2\sin x)$
9. $\frac{4x}{(x^2+1)^2}$ **10.** $\frac{\ln^2 x+\ln x+1}{(\ln x+1)^2}$ **11.** $\frac{2x}{3(x^2+1)}\sqrt[3]{\frac{1+x}{1-x}}$ **12.** $-\frac{(1-x)^{a-1}[a+b+(a-b)x]}{(1+x)^{b+1}}$

3 **1.** $-\operatorname{tg} x$ **2.** $2x\ln\frac{1+x}{1-x}$ **3.** $\frac{1}{x\ln x\ln(\ln x)}$ **4.** $x\sin^2 x$ **5.** $-\frac{1+\cos^2 x}{2\sin^3 x}$ **6.** $4\operatorname{tg}^5 x$
7. $\frac{x}{(x^2-2)\sqrt{1-x^2}}$ **8.** $(\arcsin x)^2$ **9.** $e^{\sin x+\cos x}(\cos x-\sin x)$ **10.** $2^{\operatorname{tg} x}\frac{\ln 2}{\cos^2 x}$ **11.** $\frac{1}{2}e^{\sqrt{x}}$
12. $a^a\cdot x^{a^{a-1}}+ax^{a-1}a^{x^a}\ln a+a^x\cdot a^{a^x}\ln^2 a$

4 **1.** $e^{ax}\sin bx$ **2.** $\frac{x\arcsin x}{(1-x^2)^{3/2}}$ **3.** $\frac{1}{a-bx^2}$ **4.** $\frac{1}{a+b\cos x}$ **5.** $\sqrt{x^2+a^2}$ **6.** $-\frac{\arccos x}{x^2}$
7. $\frac{1}{1+x^4}$

5 **1.** $x^x(\ln x+1)$ **2.** $x^x\cdot x^{x^x}\cdot\left(\ln^2 x+\ln x+\frac{1}{x}\right)$ **3.** $(\sin x)^{1+\cos x}\cdot(\operatorname{ctg}^2 x-\ln\sin x)$
4. $(\ln x)^{\operatorname{tg} x}\cdot\left(\frac{\ln\ln x}{\cos^2 x}+\frac{\operatorname{tg} x}{x\ln x}\right)$

6 **1.** $2xy+x^2y'$; **2.** $(\sin y+\cos y)y'$; **3.** $y'e^y(\frac{1}{y}-\frac{1}{y'^2})$; **4.** $(3y^2+2y+1)y'$.