

# ÚLOHY NA DERIVOVÁNÍ

Najděte derivace funkcí:

845.  $y = \frac{2x}{1-x^2}$ .

846.  $y = \frac{1+x-x^2}{1-x+x^2}$ .

847.  $y = \frac{x}{(1-x)^2(1+x)^3}$ .

848.  $y = \frac{(2-x^2)(3-x^3)}{(1-x)^2}$ .

849.  $y = \frac{(1-x)^p}{(1+x)^q}$ .

855.  $y = (1+x)\sqrt{2+x^2}\sqrt[3]{3+x^3}$ .

856.  $y = \frac{m+n}{\sqrt{(1-x)^m(1+x)^n}}$ .

857.  $y = \frac{x}{\sqrt{a^2-x^2}}$ .

858.  $y = \sqrt[3]{\frac{1+x^3}{1-x^3}}$ .

859.  $y = \frac{1}{\sqrt{1+x^2}(x+\sqrt{1+x^2})}$ .

865.  $y = \sin^n x \cos nx$ .

866.  $y = \sin[\sin(\sin x)]$ .

868.  $y = \frac{\cos x}{2 \sin^2 x}$ .

870.  $y = \frac{\sin x - x \cos x}{\cos x + x \sin x}$ .

850.  $y = \frac{x^p(1-x)^q}{1+x}$ .

851.  $y = x + \sqrt{x} + \sqrt[3]{x}$ .

852.  $y = \frac{1}{x} + \frac{1}{\sqrt{x}} + \frac{1}{\sqrt[3]{x}}$ .

853.  $y = \sqrt[3]{x^2} - \frac{2}{\sqrt{x}}$ .

854.  $y = x\sqrt{1+x^2}$ .

860.  $y = \sqrt{x + \sqrt{x + \sqrt{x}}}$ .

861.  $y = \sqrt[3]{1 + \sqrt[3]{1 + \sqrt[3]{x}}}$ .

862.  $y = \cos 2x - 2 \sin x$ .

863.  $y = (2-x^2) \cos x + 2x \sin x$ .

864.  $y = \sin(\cos^2 x) \cdot \cos(\sin^2 x)$ .

867.  $y = \frac{\sin^2 x}{\sin x^2}$ .

869.  $y = \frac{1}{\cos^n x}$ .

871.  $y = \operatorname{tg} \frac{x}{2} - \operatorname{ctg} \frac{x}{2}$ .

872.  $y = \operatorname{tg} x - \frac{1}{3} \operatorname{tg}^3 x + \frac{1}{5} \operatorname{tg}^5 x.$  875.  $y = \sin [\cos^2 (\operatorname{tg}^3 x)].$   
 876.  $y = e^{-x^2}.$   
 873.  $y = 4 \sqrt[3]{\operatorname{ctg}^2 x} + \sqrt[3]{\operatorname{ctg}^8 x}.$  877.  $y = 2^{\operatorname{tg} \frac{1}{x}}.$   
 874.  $y = \sec^2 \frac{x}{a} + \operatorname{cosec}^2 \frac{x}{a}.$  878.  $y = e^x (x^2 - 2x + 2).$   
 879.  $y = \left[ \frac{1-x^2}{2} \sin x - \frac{(1+x)^2}{2} \cos x \right] e^{-x}.$   
 880.  $y = e^x \left( 1 + \operatorname{ctg} \frac{x}{2} \right).$  882.  $y = e^{ax} \frac{a \sin bx - b \cos bx}{\sqrt{a^2 + b^2}}.$   
 881.  $y = \frac{\ln 3 \cdot \sin x + \cos x}{3^x}.$  883.  $y = e^x + e^{e^x} + e^{ee^x}.$   
 884.  $y = \left( \frac{a}{b} \right)^x \left( \frac{b}{x} \right)^a \left( \frac{x}{a} \right)^b.$  ( $a > 0, b > 0$ ).  
 885.  $y = x^{a^a} + a^{x^a} + a^{ax}$  ( $a > 0$ ). 887.  $y = \ln (\ln (\ln x)).$   
 886.  $y = \lg^3 x^2.$  888.  $y = \ln (\ln^2 (\ln^3 x)).$   
 889.  $y = \frac{1}{2} \ln (1+x) - \frac{1}{4} \ln (1+x^2) - \frac{1}{2(1+x)}.$   
 890.  $y = \frac{1}{4} \ln \frac{x^2-1}{x^2+1}.$   
 891.  $y = \frac{1}{4(1+x^4)} + \frac{1}{4} \ln \frac{x^4}{1+x^4}.$   
 892.  $y = \frac{1}{2\sqrt{6}} \ln \frac{x\sqrt{3}-\sqrt{2}}{x\sqrt{3}+\sqrt{2}}.$   
 893.  $y = \frac{1}{1-k} \ln \frac{1+x}{1-x} + \frac{\sqrt{k}}{1-k} \ln \frac{1+x\sqrt{k}}{1-x\sqrt{k}}$  ( $0 < k < 1$ ).  
 894.  $y = \sqrt{x+1} - \ln (1 + \sqrt{x+1}).$   
 895.  $y = \ln (x + \sqrt{x^2+1}).$   
 896.  $y = x \ln (x + \sqrt{1+x^2}) - \sqrt{1+x^2}.$   
 897.  $y = x \ln^2 (x + \sqrt{1+x^2}) - 2\sqrt{1+x^2} \ln (x + \sqrt{1+x^2}) + 2x.$   
 898.  $y = \frac{x}{2} \sqrt{x^2+a^2} + \frac{a^2}{2} \ln (x + \sqrt{x^2+a^2}).$   
 899.  $y = \frac{1}{2\sqrt{ab}} \ln \frac{\sqrt{a}+x\sqrt{b}}{\sqrt{a}-x\sqrt{b}}$  ( $a > 0, b > 0$ ).  
 900.  $y = \frac{2+3x^2}{x^4} \sqrt{1-x^2} + 3 \ln \frac{1+\sqrt{1-x^2}}{x}.$   
 901.  $y = \ln \operatorname{tg} \frac{x}{2}.$  903.  $y = \frac{1}{2} \operatorname{ctg}^2 x + \ln \sin x.$   
 902.  $y = \ln \operatorname{tg} \left( \frac{x}{2} + \frac{\pi}{4} \right).$  904.  $y = \ln \sqrt{\frac{1-\sin x}{1+\sin x}}.$

$$905. y = -\frac{\cos x}{2 \sin^2 x} + \ln \sqrt{\frac{1 + \cos x}{\sin x}}.$$

$$906. y = \ln \frac{b + a \cos x + \sqrt{b^2 - a^2} \sin x}{a + b \cos x} \quad (0 \leq |\alpha| < |b|).$$

$$907. y = \frac{1}{x} (\ln^3 x + 3 \ln^2 x + 6 \ln x + 6).$$

$$908. y = \frac{1}{4x^4} \ln \frac{1}{x} - \frac{1}{16x^4}.$$

$$909. y = \frac{3}{2} (1 - \sqrt[3]{1+x^2})^2 + 3 \ln (1 + \sqrt[3]{1+x^2}).$$

$$910. y = \ln \left[ \frac{1}{x} + \ln \left( \frac{1}{x} + \ln \frac{1}{x} \right) \right].$$

$$911. y = x [\sin (\ln x) - \cos (\ln x)].$$

$$912. y = \ln \operatorname{tg} \frac{x}{2} - \cos x \cdot \ln \operatorname{tg} x. \quad 915. y = \operatorname{arctg} \frac{x^2}{a}.$$

$$913. y = \arcsin \frac{x}{2}.$$

$$916. y = \frac{1}{\sqrt{2}} \operatorname{arctg} \frac{\sqrt{2}}{x}.$$

$$914. y = \arccos \frac{1-x}{\sqrt{2}}.$$

$$917. y = \sqrt{x} - \operatorname{arctg} \sqrt{x}.$$

$$918. y = x + \sqrt{1-x^2} \cdot \arccos x.$$

$$919. y = x \arcsin \sqrt{\frac{x}{1+x}} + \operatorname{arctg} \sqrt{x} - \sqrt{x}.$$

$$920. y = \arccos \frac{1}{x}.$$

$$923. y = \arcsin (\sin x - \cos x).$$

$$921. y = \arcsin (\sin x).$$

$$924. y = \arccos \sqrt{1-x^2}.$$

$$922. y = \arccos (\cos^2 x).$$

$$925. y = \operatorname{arctg} \frac{1+x}{1-x}.$$

$$926. y = \operatorname{arctg} \left( \frac{\sin x + \cos x}{\sin x - \cos x} \right).$$

$$927. y = \frac{2}{\sqrt{a^2-b^2}} \operatorname{arctg} \left( \sqrt{\frac{a-b}{a+b}} \operatorname{tg} \frac{x}{2} \right) \quad (a > b \geq 0).$$

$$928. y = \arcsin \frac{1-x^2}{1+x^2}.$$

$$929. y = \frac{1}{\arccos^2(x^2)}.$$

$$930. y = \operatorname{arctg} x + \frac{1}{3} \operatorname{arctg} (x^3).$$

$$931. y = \ln (1 + \sin^2 x) - 2 \sin x \cdot \operatorname{arctg} (\sin x).$$

$$932. y = \ln \left( \arccos \frac{1}{\sqrt{x}} \right).$$

$$933. y = \ln \frac{x+a}{\sqrt{x^2+b^2}} + \frac{a}{b} \operatorname{arctg} \frac{x}{b} \quad (b \neq 0)$$

$$934. y = \frac{x}{2} \sqrt{a^2-x^2} + \frac{a^2}{2} \arcsin \frac{x}{a} \quad (a > 0).$$

непрерывной. 802. а)  $\delta = \frac{\varepsilon}{5}$ ; б)  $\delta = \frac{\varepsilon}{8}$ ; в)  $\delta = 0,01\varepsilon$ ; г)  $\delta = \varepsilon^2$  ( $\varepsilon \leq 1$ ); д)  $\delta = \frac{\varepsilon}{3}$ ; е)  $\delta = \min\left(\frac{\varepsilon}{3}, \frac{\varepsilon^2}{3+\varepsilon}\right)$ . 803.  $n \geq 1\,800\,000$ .  
 808. а)  $\omega_f(\delta) \leq 3\delta$ ; б)  $\omega_f(\delta) \leq \sqrt{\delta}$ ; в)  $\omega_f(\delta) \leq \frac{\delta}{\sqrt{2a}}$ ; г)  $\omega_f(\delta) \leq \delta \sqrt{2}$ .  
 818.  $f(x) = \cos ax$  или  $f(x) = \operatorname{ch} ax$ . 819.  $f(x) = \cos ax$ ;  $g(x) = \pm \sin ax$  ( $a = \operatorname{const}$ ).

## Отдел II

821.  $\Delta x = 999$ ;  $\Delta y = 3$ . 822.  $\Delta x = -0,009$ ;  $\Delta y = 990\,000$ . 823. а)  $\Delta y = a\Delta x$ ; б)  $\Delta y = (2ax + b)\Delta x + a(\Delta x)^2$ ; в)  $\Delta y = a^x(a^{\Delta x} - 1)$ . 825. а) 5; б) 4,1; в) 4,01; г)  $4 + \Delta x$ ; 4. 826.  $3 + 3h + h^2$ ; а) 3,31; б) 3,0301; в) 3,003001; 3. 827. а)  $v_{\text{ср}} = 215 \frac{\text{м}}{\text{сек}}$ ; б)  $v_{\text{ср}} = 210,5 \frac{\text{м}}{\text{сек}}$ ; в)  $v_{\text{ср}} = 210,05 \frac{\text{м}}{\text{сек}}$ ;  $210 \frac{\text{м}}{\text{сек}}$ . 828. а)  $2x$ ; б)  $3x^2$ ; в)  $-\frac{1}{x^2}$  ( $x \neq 0$ ); г)  $\frac{1}{2\sqrt{x}}$  ( $x > 0$ ); д)  $\frac{1}{3\sqrt[3]{x^2}}$  ( $x \neq 0$ ); е)  $\frac{1}{\cos^2 x}$  ( $x \neq (2k-1)\frac{\pi}{2}$ ,  $k = 0, \pm 1, \dots$ ); ж)  $\frac{1}{\sin^2 x}$  ( $x \neq k\pi$ ,  $k = 0, \pm 1, \dots$ ); з)  $\frac{1}{\sqrt{1-x^2}}$  ( $|x| < 1$ ); и)  $-\frac{1}{\sqrt{1-x^2}}$  ( $|x| < 1$ ); к)  $\frac{1}{1+x^2}$ . 829. -8; 0; 0. 830. 4. 831.  $1 + \frac{\pi}{4}$ . 832.  $f'(a)$ . 834.  $y' = 1 - 2x$ ; 1, 0, -1, 21. 835.  $y' = x^2 + x - 2$ ; а) -2; 1; б) -1; 0; в) -4; 3. 836.  $10a^3x - 5x^4$ . 837.  $\frac{a}{a+b}$ . 838.  $2x - (a+b)$ . 839.  $2(x+2)(x+3)^2(3x^2+11x+9)$ . 840.  $x \sin 2a + \cos 2a$ . 841.  $mn[x^{m-1} + x^{n-1} + (m+n)x^{m+n-1}]$ . 842.  $-(1-x)^2(1-x^2)(1-x^3)^2(1+6x+15x^2+14x^3)$ . 842.1.  $-20(17+12x)(5+2x)^9(3-4x)^{19}$ . 843.  $-\left(\frac{1}{x^2} + \frac{4}{x^3} + \frac{9}{x^4}\right)$  ( $x \neq 0$ ). 845.  $\frac{2(1+x^2)}{(1-x^2)^2}$  ( $|x| \neq 1$ ). 846.  $\frac{2(1-2x)}{(1-x+x^2)^2}$ . 847.  $\frac{1-x+4x^2}{(1-x)^3(1+x)^4}$  ( $|x| \neq 1$ ). 848.  $\frac{12-6x-6x^2+2x^3+5x^4-3x^5}{(1-x)^3}$  ( $x \neq 1$ ). 849.  $\frac{(1-x)^{p-1}[(p+q)+(p-q)x]}{(1+x)^{q+1}}$  ( $x \neq -1$ ). 850.  $\frac{x^{p-1}(1-x)^{q-1}}{(1+x)^2} \times [\rho - (q+1)x - (p+q-1)x^2]$  ( $x \neq -1$ ). 851.  $1 + \frac{1}{2\sqrt{x}} + \frac{1}{3\sqrt[3]{x^2}}$  ( $x > 0$ ). 852.  $-\frac{1}{x^2} - \frac{1}{2x\sqrt{x}} - \frac{1}{3x\sqrt[3]{x}}$  ( $x > 0$ ). 853.  $\frac{2}{3\sqrt[3]{x}} + \frac{1}{x\sqrt{x}}$  ( $x > 0$ ). 854.  $\frac{1+2x^2}{\sqrt{1+x^2}}$ . 855.  $\frac{6+3x+8x^2+4x^3+2x^4+3x^5}{\sqrt{2+x^2}\sqrt[3]{(3+x^3)^2}}$  ( $x \neq \sqrt[3]{-3}$ ). 856.  $\frac{(n-m) - (n+m)x}{(n+m)^{n+m}\sqrt{(1-x)^n(1+x)^m}}$ . 857.  $\frac{a^2}{(a^2-x^2)^2}$  ( $|x| < |a|$ ). 858.  $\frac{2x^2}{1-x^6}\sqrt[3]{\frac{1+x^3}{1-x^3}}$  ( $|x| \neq 1$ ). 859.  $\frac{1}{(1+x^2)^{\frac{3}{2}}}$ . 860.  $\frac{1+2\sqrt{x}+4\sqrt{x}\sqrt{x+\sqrt{x}}}{8\sqrt{x}\sqrt{x+\sqrt{x}}\sqrt{x+\sqrt{x+\sqrt{x}}}}$  ( $x > 0$ ). 861.  $\frac{1}{27} \cdot \frac{1}{\sqrt[3]{x^3(1+\sqrt[3]{x})^4}}$  ×

- $\frac{1}{\sqrt[3]{(1+\sqrt[3]{1+\sqrt[3]{x}})^2}}$  ( $x \neq 0, x \neq -1, x \neq -8$ ). 862.  $-2 \cos x (1 + 2 \sin x)$ .  
 863.  $x^2 \sin x$ . 864.  $-\sin 2x \cdot \cos (\cos 2x)$ . 865.  $n \sin^{n-1} x \cdot \cos (n+1) x$ .  
 866.  $\cos x \cdot \cos (\sin x) \cdot \cos [\sin (\sin x)]$ . 867.  $\frac{2 \sin x (\cos x \sin x^2 - x \sin x \cos x^2)}{\sin^2 x^2}$   
 ( $x^2 \neq k\pi; k=1, 2, \dots$ ). 868.  $-\frac{1 + \cos^2 x}{2 \sin^3 x}$  ( $x \neq k\pi; k=0, \pm 1, \pm 2, \dots$ ).  
 869.  $\frac{n \sin x}{\cos^{n+1} x} \left( x \neq \frac{2k-1}{2} \pi, k - \text{целое} \right)$ . 870.  $\frac{x^2}{(\cos x + x \sin x)^2}$ . 871.  $\frac{2}{\sin^2 x}$ ;  
 ( $x \neq k\pi; k=0, \pm 1, \pm 2, \dots$ ). 872.  $1 + \operatorname{tg}^6 x$  ( $x \neq (2k+1) \frac{\pi}{2}; k=0, \pm 1, \dots$ ).  
 873.  $\frac{8}{3 \sin^4 x \sqrt[3]{\operatorname{ctg} x}}$  ( $x \neq k\pi, k - \text{целое}$ ). 874.  $-\frac{16 \cos \frac{2x}{a}}{a \sin^3 \frac{2x}{a}}$  ( $x \neq \frac{k\pi a}{2}, k - \text{целое}$ ).  
 875.  $-3 \operatorname{tg}^2 x \cdot \sec^2 x \cdot \sin (2 \operatorname{tg}^3 x) \cdot \cos [\cos^2 (\operatorname{tg}^3 x)]$  ( $x \neq \frac{\pi}{3} + k\pi, k - \text{целое}$ ).  
 876.  $-2xe^{-x^2}$ . 877.  $-\frac{1}{x^2} 2^{\operatorname{tg} \frac{1}{x}} \sec^2 \frac{1}{x} \ln 2$ . 878.  $x^2 e^x$ . 879.  $x^2 e^{-x} \sin x$ .  
 880.  $\frac{e^x (\sin x - \cos x)}{2 \sin^2 \frac{x}{2}}$  ( $x \neq 2k\pi, k - \text{целое}$ ). 881.  $-\frac{1 + \ln^2 3}{3x} \sin x$ .  
 882.  $\sqrt{a^2 + b^2} e^{ax} \sin bx$ . 883.  $e^x [1 + e^{e^x} (1 + e^{e^{e^x}})]$ . 884.  $y \left( \ln \frac{a}{b} - \frac{a-b}{x} \right)$  ( $x > 0$ ).  
 885.  $a^a \cdot x a^{a-1} + a x a^{-1} a^x \ln a + a x \cdot a^{a^x} \ln^2 a$ . 886.  $\frac{6}{x} \lg e \cdot \lg^2 x^2$  ( $x \neq 0$ ).  
 887.  $\frac{1}{x \ln x \ln (\ln x)}$  ( $x > e$ ). 888.  $\frac{6}{x \ln x \ln (\ln^3 x)}$  ( $x > e$ ). 889.  $\frac{1}{(1+x)^2 (1+x^2)}$   
 ( $x > -1$ ). 890.  $\frac{x}{x^4 - 1}$  ( $|x| > 1$ ). 891.  $\frac{1}{x(1+x^2)^2}$  ( $x \neq 0$ ). 892.  $\frac{1}{3x^2 - 2}$   
 ( $|x| > \sqrt{\frac{2}{3}}$ ). 893.  $\frac{2}{(1-x^2)(1-kx^2)}$  ( $|x| < 1$ ). 894.  $\frac{1}{2(1+\sqrt{x+1})}$   
 ( $x > -1$ ). 895.  $\frac{1}{\sqrt{x^2+1}}$ . 896.  $\ln(x + \sqrt{x^2+1})$ . 897.  $\ln^2(x + \sqrt{x^2+1})$ .  
 898.  $\sqrt{x^2+a^2}$ . 899.  $\frac{1}{a-bx^2} \left( |x| < \sqrt{\frac{a}{b}} \right)$ . 900.  $-\frac{8}{x^5 \sqrt{1-x^2}}$  ( $0 < x < 1$ ).  
 901.  $\frac{1}{\sin x}$  ( $0 < x - 2k\pi < \pi, k - \text{целое}$ ). 902.  $\frac{1}{\cos x} \left( |x - 2k\pi| < \frac{\pi}{2}, k - \text{целое} \right)$ .  
 903.  $-\operatorname{ctg}^3 x$  ( $0 < x - 2k\pi < \pi, k - \text{целое}$ ). 904.  $-\frac{1}{\cos x} \left( x \neq \frac{2k-1}{2} \pi, k - \text{целое} \right)$ .  
 905.  $\frac{\cos^2 x}{\sin^3 x}$  ( $0 < x - 2k\pi < \pi, k - \text{целое}$ ). 906.  $\frac{\sqrt{b^2-a^2}}{a+b \cos x}$ . 907.  $-\frac{\ln^3 x}{x^2}$  ( $x > 0$ ).  
 908.  $\frac{1}{x^5} \ln x$  ( $x > 0$ ). 909.  $\frac{2x}{1+\sqrt[3]{1+x^2}}$ . 910.  $-\frac{1+x+\frac{1}{x}+\ln \frac{1}{x}}{\left(1+x \ln \frac{1}{x}\right) \left[1+x \ln \left(\frac{1}{x} + \ln \frac{1}{x}\right)\right]}$

911.  $2 \sin(\ln x)$  ( $x > 0$ ). 912.  $\sin x \cdot \ln \operatorname{tg} x$  ( $0 < x - 2k\pi < \frac{\pi}{2}, k - \text{целое}$ ).
913.  $\frac{1}{\sqrt{4-x^2}}$  ( $|x| < 2$ ). 914.  $\frac{1}{\sqrt{1+2x-x^2}}$  ( $|x-1| < \sqrt{2}$ ). 915.  $\frac{2ax}{x^4+a^2}$  ( $a \neq 0$ ). 916.  $\frac{1}{x^2+2}$  ( $x \neq 0$ ). 917.  $\frac{\sqrt{x}}{2(1+x)}$  ( $x \geq 0$ ). 918.  $-\frac{x}{\sqrt{1-x^2}} \arccos x$  ( $|x| < 1$ ). 919.  $\arcsin \sqrt{\frac{x}{1+x}}$  ( $x \geq 0$ ). 920.  $\frac{1}{|x| \sqrt{x^2-1}}$  ( $|x| > 1$ ).
921.  $\operatorname{sgn}(\cos x)$  ( $x \neq \frac{2k-1}{2}\pi, k - \text{целое}$ ). 922.  $\frac{2 \operatorname{sgn}(\sin x) \cdot \cos x}{\sqrt{1+\cos^2 x}}$  ( $x \neq k\pi, k - \text{целое}$ ). 923.  $\frac{\sin x + \cos x}{\sqrt{\sin 2x}}$  ( $0 < x - k\pi < \frac{\pi}{2}, k - \text{целое}$ ). 924.  $\frac{\operatorname{sgn} x}{\sqrt{1-x^2}}$  ( $0 < |x| < 1$ ). 925.  $\frac{1}{1+x^2}$  ( $x \neq 1$ ). 926.  $1$  ( $x \neq \frac{\pi}{4} + k\pi, k - \text{целое}$ ). 927.  $\frac{1}{a+b \cos x}$ .
928.  $-\frac{2 \operatorname{sgn} x}{1+x^2}$  ( $x \neq 0$ ). 929.  $\frac{4x}{\sqrt{1-x^2} \arccos^3(x^2)}$  ( $|x| < 1$ ). 930.  $\frac{1+x^4}{1+x^6}$ .
931.  $-2 \cos x \cdot \operatorname{arctg}(\sin x)$ . 932.  $\frac{1}{2x \sqrt{x-1} \arccos \frac{1}{\sqrt{x}}}$  ( $x > 1$ ). 933.  $\frac{a^2+b^2}{(x+a)(x^2+b^2)}$  ( $x > -a$ ). 934.  $\sqrt{a^2-x^2}$ . 935.  $\frac{1}{x^3+1}$  ( $x \neq -1$ ). 936.  $\frac{1}{x^4+1}$  ( $|x| \neq 1$ ).
937.  $(\arcsin x)^2$  ( $|x| < 1$ ). 938.  $-\frac{\arccos x}{x^2}$  ( $0 < |x| < 1$ ). 939.  $\frac{x \ln x}{(x^2-1)^2}$  ( $x > 1$ ).
940.  $\frac{x \arcsin x}{(1-x^2)^2}$  ( $|x| < 1$ ). 941.  $\frac{x^3}{x^6+1}$  ( $|x| \neq \frac{1}{\sqrt{2}}$ ). 942.  $\frac{12x^5}{(1+x^{12})^2}$ .
943.  $-\frac{1}{(1-x)\sqrt[3]{x}}$  ( $x < 1$ ). 944.  $\frac{1}{2\sqrt{1-x^2}}$  ( $|x| < 1$ ). 945.  $\frac{1}{\sqrt{ax-x^2}}$  ( $0 < x < a$ ). 946.  $\frac{x^2}{\sqrt{1-2x-x^2}}$  ( $|x+1| < \sqrt{2}$ ). 947.  $\frac{1}{\sqrt[4]{1+x^2}}$ .
948.  $\frac{\sin 2x}{\sin^4 x + \cos^2 x}$  ( $x \neq \frac{2k-1}{2}\pi, k - \text{целое}$ ). 949.  $\frac{\sqrt{1-x^2}}{x} - \frac{x}{\sqrt{1-x^2}} \times \ln \sqrt{\frac{1-x}{1+x}}$  ( $|x| < 1$ ). 950.  $\frac{x^2}{1+x^2} \operatorname{arctg} x$ . 951.  $\frac{e^x}{\sqrt{1+e^{2x}}}$ . 952.  $\frac{1}{2(1+x^2)}$ .
953.  $\frac{\sin a \operatorname{sgn}(\cos x - \cos a)}{1 - \cos a \cos x}$  ( $\cos x \neq \cos a$ ). 954.  $\frac{1}{(x^2-1)\sqrt{x^2+2}}$  ( $0 < |x| < 1$ ).
955.  $\frac{\sqrt{1+x^4}}{1-x^4}$  ( $|x| \neq 1$ ). 956.  $\frac{4}{(1+x^2)^2 \sqrt{1-x^2}}$  ( $|x| < 1$ ). 957.  $\frac{2x(\cos x^2 + \sin x^2)}{\sqrt{\sin(2x^2)}}$  ( $0 < |x| < \sqrt{\left(\frac{1}{2}\right)\pi}, k=0, 1, \dots$ ). 958.  $2x [\operatorname{sgn}(\cos x^2) + \operatorname{sgn}(\sin x^2)]$  ( $|x| \neq \frac{k\pi}{2}, k=0, 1, 2, \dots$ ). 959.  $\frac{2m}{\sqrt{1-x^2}} \cdot e^{m(\arcsin x)} \cos m(\arcsin x)$  ( $|x| < 1$ ). 960.  $\frac{e^x-1}{e^{2x}+1}$ .