

Задание №1

Найти производную:

$$y = \frac{2(3x^3 + 4x^2 - x - 2)}{15\sqrt{1+x}} \quad (1)$$

$$y = \frac{x^6 + 8x^3 - 128}{\sqrt{8-x^3}} \quad (2)$$

$$y = x - \ln(2 + e^x + 2\sqrt{e^{2x} + e^x + 1}) \quad (3)$$

$$y = x + \frac{8}{1 + e^{x/4}} \quad (4)$$

$$y = \sqrt{x} \ln(\sqrt{x} + \sqrt{x+a}) - \sqrt{x+a} \quad (5)$$

$$y = \frac{x(\cos \ln x + \sin \ln x)}{2} \quad (6)$$

$$y = \sin \sqrt{3} + \frac{1}{3} \frac{\sin^2 3x}{\cos 6x} \quad (7)$$

$$y = \frac{\sin \operatorname{tg}(\frac{1}{5}) \cdot \cos^2 16x}{32 \sin 32} \quad (8)$$

$$y = \operatorname{arctg} \frac{\operatorname{tg} x - \operatorname{ctg} x}{\sqrt{2}} \quad (9)$$

$$y = 6 \operatorname{arcsin} \frac{\sqrt{x}}{2} - \frac{6+x}{2} \sqrt{x(4-x)} \quad (10)$$

$$y = \frac{1}{4\sqrt{5}} \ln \frac{2 + \sqrt{5} \operatorname{tg} x}{2 - \sqrt{5} \operatorname{tg} x} \quad (11)$$

$$y = -\frac{\sin x}{2 \cos^2 x} + \frac{4}{3} \operatorname{arccos} \operatorname{ctg} x \quad (12)$$

Задание №2

Найти производную:

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

$$y = \frac{\sqrt{2x+3}(x-2)}{x^2} \quad (2)$$

$$y = \frac{e^{2x}(2 - \sin 2x - \cos 2x)}{8x} \quad (3)$$

$$y = \ln(e^x + \sqrt{e^{2x}-1}) + \operatorname{arcsin} e^{-x} \quad (4)$$

$$y = \ln x + \sqrt{a^2 + x^2} \quad (5)$$

$$y = \ln \cos \frac{2x+3}{2x+1} \quad (6)$$

$$y = \cos \ln 2 - \frac{1}{3} \frac{\cos^2 3x}{\sin 6x} \quad (7)$$

$$y = \frac{\operatorname{ctg} \sin(\frac{1}{3}) \cdot \sin^2 21x}{17 \sin 34x} \quad (8)$$

$$y = \operatorname{arcsin} \frac{\sqrt{x}-2}{\sqrt{5x}} \quad (9)$$

$$y = \frac{x-3}{2} \sqrt{6x-x^2-8} + \operatorname{arcsin} \sqrt{\frac{x}{2}-1} \quad (10)$$

$$y = \frac{\sin x}{4 \cos^4 x} + \frac{3 \sin x}{8 \cos^2 x} + \frac{3}{8} \operatorname{arctg} \sin x \quad (11)$$

$$y = -\frac{\cos x}{2 \cos^2 x} + \frac{3}{2} \operatorname{arcsin} \operatorname{tg} x \quad (12)$$

Задание №3

Найти производную:

$$y = \frac{x^4 - 8x^2}{2(x^2 - 4)} \quad (1)$$

$$y = (1 - x^2) \sqrt[5]{x^3 + \frac{1}{x}} \quad (2)$$

$$y = \frac{1}{2} \operatorname{arctg} \frac{e^x - 3}{2} \quad (3)$$

$$y = x - e^{-x} \arcsin e^x - \ln(1 + \sqrt{1 - e^{2x}}) \quad (4)$$

$$y = 2\sqrt{x} - 4 \ln(2 + \sqrt{x}) \quad (5)$$

$$y = \lg \ln \operatorname{ctg} x \quad (6)$$

$$y = \operatorname{tg} \lg \frac{1}{3} + \frac{1 \sin^2 4x}{4 \cos 8x} \quad (7)$$

$$y = \frac{\sqrt[5]{\operatorname{ctg} 2} \cdot \cos^2 18x}{36 \sin 36x} \quad (8)$$

$$y = \frac{2x - 1}{4} \sqrt{2 + x - x^2} + \frac{9}{8} \arcsin \frac{2x - 1}{3} \quad (9)$$

$$y = \frac{(1 + x) \operatorname{arctg} \sqrt{x} - \sqrt{x}}{x} \quad (10)$$

$$y = \frac{1}{2} \ln \frac{1 + \sqrt{\operatorname{tg} x}}{1 - \sqrt{\operatorname{tg} x}} - \operatorname{arctg} \sqrt{\operatorname{tg} x} \quad (11)$$

$$y = \frac{1}{\sqrt{8}} \arcsin \frac{3 + \cos x}{1 + 3 \cos x} \quad (12)$$

Задание №4

Найти производную:

$$y = \frac{2x^2 - x - 1}{3\sqrt{2 + 4x}} \quad (1)$$

$$y = \frac{(2x^2 + 3)\sqrt{x^2 - 3}}{9x^3} \quad (2)$$

$$y = 2(x - 2)\sqrt{1 + e^x} - 2 \ln \frac{\sqrt{1 + e^x} - 1}{\sqrt{1 + e^x} + 1} \quad (3)$$

$$y = \operatorname{arctg} e^x - e^{-x} \quad (4)$$

$$y = \ln \frac{x^2}{\sqrt{1 - ax^4}} \quad (5)$$

$$y = \log_a \frac{1}{1 - x^4} \quad (6)$$

$$y = \operatorname{ctg} \sqrt[3]{5} - \frac{1 \cos^2 4x}{8 \sin 8x} \quad (7)$$

$$y = \frac{\operatorname{tg} \ln 2 \cdot \sin^2 10x}{19 \cos 38x} \quad (8)$$

$$y = \operatorname{arctg} \frac{\sqrt{1 + x^2} - 1}{x} \quad (9)$$

$$y = \frac{2\sqrt{1 - x} \arcsin \sqrt{x}}{x} + \frac{2}{\sqrt{x}} \quad (10)$$

$$y = \frac{1}{8\sqrt{2}} \ln \frac{\sqrt{2} + \operatorname{tg} x}{\sqrt{2} - \operatorname{tg} x} - \frac{\operatorname{tg} x}{4(2 - \operatorname{tg}^2 x)} \quad (11)$$

$$y = \frac{1}{\sqrt{8}} \ln \frac{4 + \sqrt{8} \operatorname{tg} \frac{x}{2}}{4 - \sqrt{8} \operatorname{tg} \frac{x}{2}} \quad (12)$$

Задание №5

Найти производную:

$$y = \frac{(1+x^8)\sqrt{1+x^8}}{12x^{12}} \quad (1)$$

$$y = \frac{x-1}{(x^2+5)\sqrt{x^2+5}} \quad (2)$$

$$y = \frac{1}{\ln 4} \ln \frac{1+2^x}{1-2^x} \quad (3)$$

$$y = x - \ln(1+e^x) - 2e^{x/2} \operatorname{arctg} e^{x/2} - (\operatorname{arctg} e^{x/2})^2 \quad (4)$$

$$y = \ln(\sqrt{x} + \sqrt{x+1}) \quad (5)$$

$$y = \frac{1}{\sqrt{2}} \ln(\sqrt{2} \operatorname{tg} x + \sqrt{1+2 \operatorname{tg}^2 x}) \quad (6)$$

$$y = \frac{\cos 5 \cdot \sin^2 2x}{2 \cos 4x} \quad (7)$$

$$y = \operatorname{ctg} \cos 5 - \frac{1}{40} \frac{\cos^2 20x}{\sin 40x} \quad (8)$$

$$y = \arccos \frac{x^2-4}{\sqrt{x^4+16}} \quad (9)$$

$$y = \frac{2x-5}{4} \sqrt{5x-4-x^2} + \frac{9}{4} \arcsin \sqrt{\frac{x-1}{3}} \quad (10)$$

$$y = \frac{1}{2} \operatorname{tg} x + \frac{1}{4\sqrt{2}} \ln \frac{1+\sqrt{2} \operatorname{tg} x}{1-\sqrt{2} \operatorname{tg} x} \quad (11)$$

$$y = \left[\frac{1}{4} \ln \left| \operatorname{tg} \frac{x}{2} \right| + \frac{1}{4} \ln \frac{3+\cos x}{\sin x} \right] \quad (12)$$

Задание №6

Найти производную:

$$y = \frac{x^2}{2\sqrt{1-3x^4}} \quad (1)$$

$$y = \frac{(2x+1)\sqrt{x^2-x}}{x^2} \quad (2)$$

$$y = 2\sqrt{e^x+1} + \ln \frac{\sqrt{e^x+1}-1}{\sqrt{e^x+1}+1} \quad (3)$$

$$y = \frac{e^{x^3}}{1+x^3} \quad (4)$$

$$y = \ln \frac{a^2+x^2}{a^2-x^2} \quad (5)$$

$$y = \ln \arcsin \sqrt{1-e^{2x}} \quad (6)$$

$$y = \frac{\sin \cos 3 \cdot \cos^2 2x}{4 \sin 4x} \quad (7)$$

$$y = \sqrt{\operatorname{tg} 4} + \frac{\sin^2 21x}{21 \cos 42x} \quad (8)$$

$$y = \sqrt{\frac{2}{3}} \operatorname{arctg} \frac{3x-1}{\sqrt{6x}} \quad (9)$$

$$y = \operatorname{arctg} x + \frac{5}{6} \ln \frac{x^2+1}{x^2+4} \quad (10)$$

$$y = -\frac{1}{2} \ln \operatorname{tg} \frac{x}{2} - \frac{\cos x}{2 \sin^2 x} \quad (11)$$

$$y = -\frac{1}{4} \arcsin \frac{5+3 \cos x}{3+5 \cos x} \quad (12)$$

Задание №7

Найти производную:

$$y = \frac{(x^2 - 6)\sqrt{(4 + x^2)^3}}{120x^5} \quad (1)$$

$$y = 2\sqrt{\frac{1 - \sqrt{x}}{1 + \sqrt{x}}} \quad (2)$$

$$y = \frac{2}{3}\sqrt{(\operatorname{arctg} e^x)^3} \quad (3)$$

$$y = \frac{1}{m\sqrt{ab}} \operatorname{arctg} \left(e^{mx} \sqrt{\frac{a}{b}} \right) \quad (4)$$

$$y = \ln^2 x + \cos x \quad (5)$$

$$y = \ln \arccos \sqrt{1 - e^{4x}} \quad (6)$$

$$y = \frac{\cos \ln 7 \cdot \sin^2 7x}{7 \cos 14x} \quad (7)$$

$$y = \cos \ln 13 - \frac{1}{44} \frac{\cos^2 20x}{\sin 44x} \quad (8)$$

$$y = \frac{1}{4} \ln x - 1x + 1 - \frac{1}{2} \operatorname{arctg} x \quad (9)$$

$$y = \sqrt{1 - x^2} - x \arcsin \sqrt{1 - x^2} \quad (10)$$

$$y = \frac{1}{2a\sqrt{1 + a^2}} \ln \frac{a + \sqrt{1 + a^2} \operatorname{tg} x}{a - \sqrt{1 + a^2} \operatorname{tg} x} \quad (11)$$

$$y = \frac{1 - 8 \cos^2 x}{4 \cos^4 x} \quad (12)$$

Задание №8

Найти производную:

$$y = \frac{(x^2 - 8)\sqrt{x^2 - 8}}{6x^3} \quad (1)$$

$$y = \frac{1}{(x + 2)\sqrt{x^2 + 4x + 5}} \quad (2)$$

$$y = \frac{1}{2} \ln e^{2x} + 1 - 2 \operatorname{arctg} e^x \quad (3)$$

$$y = 3e^{\sqrt[3]{x}} (\sqrt[3]{x^2} - 2\sqrt[3]{x} + 2) \quad (4)$$

$$y = \ln^3 (1 + \cos x) \quad (5)$$

$$y = \ln bx + \sqrt{a^2 + b^2 x^2} \quad (6)$$

$$y = \cos \operatorname{ctg} 2 - \frac{1}{16} \frac{\cos^2 8x}{16 \cos^2 16x} \quad (7)$$

$$y = \ln \cos \frac{1}{3} + \frac{\sin^2 23x}{23 \cos 46x} \quad (8)$$

$$y = \frac{(x - 4)\sqrt{8x - x^2 - 7}}{2} - 9 \arccos \sqrt{\frac{(x - 1)}{6}} \quad (9)$$

$$y = \arcsin \frac{x - 2}{(x - 1)\sqrt{2}} \quad (10)$$

$$y = \frac{1}{18\sqrt{2}} \ln \frac{1 + \sqrt{2} \cot x}{1 - \sqrt{2} \cot x} \quad (11)$$

$$y = \frac{2}{\sin x} - \frac{1}{3 \cos^3 x} + \frac{\sin x}{2 \cos^2 x} + \frac{5}{2} \operatorname{arctg} \sin x \quad (12)$$

Задание №9

Найти производную:

$$y = \frac{4 + 3x^3}{x\sqrt[3]{(2+x^3)^2}} \quad (1)$$

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

$$y = \ln(e^x + 1) + \frac{18e^{2x} + 27e^x + 11}{6(e^x + 1)^3} \quad (3)$$

$$y = \ln \frac{\sqrt{1+e^x+e^{2x}} - e^x - 1}{\sqrt{1+e^x+e^{2x}} + e^x + 1} \quad (4)$$

$$y = \ln \frac{x^2}{1-x^2} \quad (5)$$

$$y = \ln \frac{\sqrt{x^2+1} + x\sqrt{2}}{\sqrt{x^2+1} + x\sqrt{2}} \quad (6)$$

$$y = \operatorname{ctg} \cos 2 + \frac{1}{6} \frac{\sin^2 6x}{\cos 12} \quad (7)$$

$$y = \operatorname{ctg} \sin \frac{1}{13} - \frac{1}{48} \frac{\cos^2 24x}{\sin 48} \quad (8)$$

$$y = \frac{(1+x) \operatorname{arctg} \sqrt{x}}{x^2} + \frac{1}{3x\sqrt{x}} \quad (9)$$

$$y = \sqrt{3} + \frac{1}{3} \operatorname{arctg} \sqrt{x} - \frac{8}{3} \operatorname{arctg} \frac{\sqrt{x}}{2} \quad (10)$$

$$y = \operatorname{arctg} \frac{\sqrt{\sin 2x}}{\operatorname{ch} x - \operatorname{sh} x} \quad (11)$$

$$y = \frac{8}{3} \cot 2x - \frac{1}{3 \cos x \sin^3 x} \quad (12)$$

Задание №10

Найти производную:

$$y = \sqrt[3]{\frac{(1+x^{3/4})^2}{x^{3/2}}} \quad (1)$$

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

$$y = 2\frac{\sqrt{2^x-1} - \operatorname{arctg} \sqrt{2^x-1}}{\ln 2} \quad (3)$$

$$y = e^{\sin x} \left(x - \frac{1}{\cos x} \right) \quad (4)$$

$$y = \ln \operatorname{tg} \left(\frac{\pi}{4} + \frac{x}{2} \right) \quad (5)$$

$$y = \ln(\operatorname{arccos} \frac{1}{\sqrt{x}}) \quad (6)$$

$$y = \sqrt[3]{\operatorname{ctg} 2} - \frac{1}{20} \frac{\cos^2 10x}{\sin 20x} \quad (7)$$

$$y = \sin \ln \frac{1}{2} + \frac{\sin^2 25x}{25 \cos 50x} \quad (8)$$

$$y = \frac{x^3}{3} \operatorname{arccos} x - \frac{2+x^2}{9} \sqrt{1-x^2} \quad (9)$$

$$y = \operatorname{arctg} \frac{\sqrt{1-x}}{1-\sqrt{x}} \quad (10)$$

$$y = \frac{1}{6} \ln \frac{1-\sin 2x}{2+\sin 2x} \quad (11)$$

$$y = \frac{1}{2} \operatorname{arctg}(\sin x) - \frac{\sin x}{2 \cos^2 x} \quad (12)$$

Задание №11

Найти производную:

$$y = \frac{x^6 + x^3 - 2}{\sqrt{1 - x^3}} \quad (1)$$

$$y = \frac{x + 7}{6\sqrt{x^2 + 2x + 7}} \quad (2)$$

$$y = \frac{e^{\alpha x}(\alpha \sin \beta x - \beta \cos \beta x)}{\alpha^2 + \beta^2} \quad (3)$$

$$y = \frac{e^x}{2} [(x - 1)^2 \cos x + (x - 1)^2 \sin x] \quad (4)$$

$$y = \ln \sqrt[4]{\frac{1 + 2x}{1 - 2x}} \quad (5)$$

$$y = \ln \arccos \sqrt{1 - e^{4x}} \quad (6)$$

$$y = \frac{1}{3} \cos \operatorname{tg} 12 + \frac{1}{10} \frac{\sin^2 10x}{\cos 20x} \quad (7)$$

$$y = \sqrt[3]{\cos \sqrt{2}} - \frac{1}{52} \frac{\cos^2 26x}{\sin 52x} \quad (8)$$

$$y = \frac{1}{2\sqrt{x}} + \frac{1+x}{2x} \operatorname{arctg} \sqrt{x} \quad (9)$$

$$y = (2x^2 + 6x + 5) \operatorname{arctg} \frac{x+1}{x+2} - x \quad (10)$$

$$y = \sqrt[4]{\frac{1 + \operatorname{tg} x}{1 - \operatorname{tg} x}} \quad (11)$$

$$y = \frac{3}{2} \ln \operatorname{tg} \frac{x}{2} + \cos x - \frac{\cos x}{2 \sin^2 x} \quad (12)$$

Задание №12

Найти производную:

$$y = \frac{(x^2 - 2)\sqrt{4 + x^2}}{24x^3} \quad (1)$$

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

$$y = \frac{e^{\alpha x}(\beta \sin \beta x + \alpha \cos \beta x)}{\alpha^2 + \beta^2} \quad (3)$$

$$y = 3e^{\sqrt[3]{x}} [\sqrt[3]{x^5} - 5\sqrt[3]{x^4} + 20x - 60\sqrt[3]{x^2} + 120\sqrt[3]{x} - 120] \quad (4)$$

$$y = x + \frac{1}{\sqrt{2}} \ln \left(\frac{x - \sqrt{2}}{x + \sqrt{2}} \right) \quad (5)$$

$$y = \ln \frac{\sqrt{5} + \operatorname{tg} \frac{x}{2}}{\sqrt{5} - \operatorname{tg} \frac{x}{2}} \quad (6)$$

$$y = \ln \sin \frac{1}{3} - \frac{1}{24} \frac{\cos^2 12x}{\sin 24x} \quad (7)$$

$$y = \sqrt[7]{\operatorname{tg} \cos 2} + \frac{\sin^2 27x}{27 \cos 54x} \quad (8)$$

$$y = \frac{3+x}{2} \sqrt{x(2-x)} + 3 \arccos \sqrt{\frac{x}{2}} \quad (9)$$

$$y = \frac{x}{2\sqrt{1-4x^2}} \arcsin 2x + \frac{1}{8} \ln(1-4x^2) \quad (10)$$

$$y = \frac{\sin x}{1 + \cos x} \quad (11)$$

$$y = -\frac{\sin x}{2 \cos^2 x} - \frac{1}{\sin x} - \frac{3}{2} \operatorname{arctg} \sin x \quad (12)$$

Задание №13

Найти производную:

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

$$y = \frac{x^2+2}{2\sqrt{1-x^4}} \quad (2)$$

$$y = e^{ax} \left[\frac{1}{2a} + \frac{a \cos 2bx + 2b \sin 2bx}{2(a^2 + 4b^2)} \right] \quad (3)$$

$$y = -\frac{e^{3x}}{3 \sin^3 x} \quad (4)$$

$$y = \ln \sin \frac{2x+4}{x+1} \quad (5)$$

$$y = \ln \frac{\ln x}{\sin \frac{1}{x}} \quad (6)$$

$$y = 8 \sin \operatorname{ctg} 3 + \frac{1}{5} \frac{\sin^2 5x}{\cos 10x} \quad (7)$$

$$y = \sin \sqrt[3]{\operatorname{tg} 2} - \frac{\cos^2 28x}{56 \sin 56x} \quad (8)$$

$$y = \frac{4+x^4}{x^3} \operatorname{arctg} \frac{x^2}{2} + \frac{4}{x} \quad (9)$$

$$y = \left(2x^2 - x - \frac{1}{2} \right) \operatorname{arctg} \frac{x^2-1}{x\sqrt{3}} - \frac{x^3}{2\sqrt{3}} - \frac{\sqrt{3}}{2} x \quad (10)$$

$$y = \frac{\cos x}{\sqrt{\sin 2x}} \quad (11)$$

$$y = \frac{\sin x}{2 \cos^2 x} + \frac{1}{2} \operatorname{arctg}(\sin x) \quad (12)$$

Задание №14

Найти производную:

$$y = \frac{\sqrt{x-1}(3x+2)}{4x^2} \quad (1)$$

$$y = \frac{(x+3)\sqrt{2x-1}}{2x+7} \quad (2)$$

$$y = x + \frac{1}{1+e^x} - \ln(1+e^x) \quad (3)$$

$$y = \arcsin e^x - \sqrt{1-e^{2x}} \quad (4)$$

$$y = \log_{16} \log_5 \operatorname{tg} x \quad (5)$$

$$y = \ln \ln \sin \left(1 + \frac{1}{x} \right) \quad (6)$$

$$y = \frac{\cos \operatorname{ctg} 3 \cdot \cos^2 14x}{28 \sin 28x} \quad (7)$$

$$y = \cos^2 \sin 3 + \frac{\sin^2 29x}{29 \cos 58x} \quad (8)$$

$$y = \arcsin \sqrt{\frac{x}{x+1}} + \operatorname{arctg} \sqrt{x} \quad (9)$$

$$y = (x + 2\sqrt{x} + 2) \operatorname{arctg} \frac{\sqrt{x}}{\sqrt{x}+2} - \sqrt{x} \quad (10)$$

$$y = \frac{\sin 3x}{\sqrt{\cos 6x}} \quad (11)$$

$$y = \frac{1}{2} \left[\frac{\sin x}{\cos^2 x} + \operatorname{arctg}(\sin x) \right] \quad (12)$$

Задание №15

Найти производную:

$$y = \frac{\sqrt{(1+x^2)^3}}{3x^3} \quad (1)$$

$$y = \frac{3x + \sqrt{x}}{\sqrt{x^2 + 2}} \quad (2)$$

$$y = x - 3 \ln(1 + e^{\frac{x}{6}}) \sqrt{1 + e^{2x}} - 3 \operatorname{arctg} e^{\frac{x}{6}} \quad (3)$$

$$y = -\frac{1}{2} e^{-x^2} (x^4 + 2x^2 + 2) \quad (4)$$

$$y = \log_4 \log_2 \operatorname{tg} x \quad (5)$$

$$y = \ln \ln^3 \ln^5 x \quad (6)$$

$$y = \frac{\cos \operatorname{tg} \frac{1}{3} \cdot \sin^2 15x}{15 \cos 30x} \quad (7)$$

$$y = \sin^3 \cos 2 - \frac{\cos^2 30x}{60 \sin 60x} \quad (8)$$

$$y = \frac{1}{2} \sqrt{\frac{1}{x^2} - 1} - \frac{\arccos x}{2x^2} \quad (9)$$

$$y = \sqrt{1 + 2x - x^2} \arcsin \frac{z\sqrt{2}}{1+x} - \sqrt{2} \ln(1+x) \quad (10)$$

$$y = \frac{1 + 8 \cos^2 x \ln \cos x}{2 \cos^2 x} \quad (11)$$

$$y = -\frac{\cos x}{2 \sin^2 x} - \frac{1}{2} \ln \operatorname{tg} \frac{x}{2} \quad (12)$$

Задание №16

Найти производную:

$$y = \frac{2(3x^3 + 4x^2 - x - 2)}{15\sqrt{1+x}} \quad (1)$$

$$y = \frac{x^6 + 8x^3 - 128}{\sqrt{8-x^3}} \quad (2)$$

$$y = x - \ln(2 + e^x + 2\sqrt{e^{2x} + e^x + 1}) \quad (3)$$

$$y = x + \frac{8}{1 + e^{x/4}} \quad (4)$$

$$y = \sqrt{x} \ln(\sqrt{x} + \sqrt{x+a}) - \sqrt{x+a} \quad (5)$$

$$y = \frac{x(\cos \ln x + \sin \ln x)}{2} \quad (6)$$

$$y = \sin \sqrt{3} + \frac{1}{3} \frac{\sin^2 3x}{\cos 6x} \quad (7)$$

$$y = \frac{\sin \operatorname{tg}(\frac{1}{5}) \cdot \cos^2 16x}{32 \sin 32} \quad (8)$$

$$y = \operatorname{arctg} \frac{\operatorname{tg} x - \operatorname{ctg} x}{\sqrt{2}} \quad (9)$$

$$y = 6 \arcsin \frac{\sqrt{x}}{2} - \frac{6+x}{2} \sqrt{x(4-x)} \quad (10)$$

$$y = \frac{1}{4\sqrt{5}} \ln \frac{2 + \sqrt{5} \operatorname{tg} x}{2 - \sqrt{5} \operatorname{tg} x} \quad (11)$$

$$y = -\frac{\sin x}{2 \cos^2 x} + \frac{4}{3} \operatorname{arccos} \operatorname{ctg} x \quad (12)$$

Задание №17

Найти производную:

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

$$y = \frac{\sqrt{2x + 3}(x - 2)}{x^2} \quad (2)$$

$$y = \frac{e^{2x}(2 - \sin 2x - \cos 2x)}{8x} \quad (3)$$

$$y = \ln(e^x + \sqrt{e^{2x} - 1}) + \arcsin e^{-x} \quad (4)$$

$$y = \ln x + \sqrt{a^2 + x^2} \quad (5)$$

$$y = \ln \cos \frac{2x + 3}{2x + 1} \quad (6)$$

$$y = \cos \ln 2 - \frac{1}{3} \frac{\cos^2 3x}{\sin 6x} \quad (7)$$

$$y = \frac{\operatorname{ctg} \sin(\frac{1}{3}) \cdot \sin^2 21x}{17 \sin 34x} \quad (8)$$

$$y = \arcsin \frac{\sqrt{x} - 2}{\sqrt{5x}} \quad (9)$$

$$y = \frac{x - 3}{2} \sqrt{6x - x^2 - 8} + \arcsin \sqrt{\frac{x}{2} - 1} \quad (10)$$

$$y = \frac{\sin x}{4 \cos^4 x} + \frac{3 \sin x}{8 \cos^2 x} + \frac{3}{8} \operatorname{arctg} \sin x \quad (11)$$

$$y = -\frac{\cos x}{2 \cos^2 x} + \frac{3}{2} \arcsin \operatorname{tg} x \quad (12)$$

Задание №18

Найти производную:

$$y = \frac{x^4 - 8x^2}{2(x^2 - 4)} \quad (1)$$

$$y = (1 - x^2) \sqrt[5]{x^3 + \frac{1}{x}} \quad (2)$$

$$y = \frac{1}{2} \operatorname{arctg} \frac{e^x - 3}{2} \quad (3)$$

$$y = x - e^{-x} \arcsin e^x - \ln(1 + \sqrt{1 - e^{2x}}) \quad (4)$$

$$y = 2\sqrt{x} - 4 \ln(2 + \sqrt{x}) \quad (5)$$

$$y = \lg \ln \operatorname{ctg} x \quad (6)$$

$$y = \operatorname{tg} \lg \frac{1}{3} + \frac{1}{4} \frac{\sin^2 4x}{\cos 8x} \quad (7)$$

$$y = \frac{\sqrt[5]{\operatorname{ctg} 2} \cdot \cos^2 18x}{36 \sin 36x} \quad (8)$$

$$y = \frac{2x - 1}{4} \sqrt{2 + x - x^2} + \frac{9}{8} \arcsin \frac{2x - 1}{3} \quad (9)$$

$$y = \frac{(1 + x) \operatorname{arctg} \sqrt{x} - \sqrt{x}}{x} \quad (10)$$

$$y = \frac{1}{2} \ln \frac{1 + \sqrt{\operatorname{tg} x}}{1 - \sqrt{\operatorname{tg} x}} - \operatorname{arctg} \sqrt{\operatorname{tg} x} \quad (11)$$

$$y = \frac{1}{\sqrt{8}} \arcsin \frac{3 + \cos x}{1 + 3 \cos x} \quad (12)$$

Задание №19

Найти производную:

$$y = \frac{2x^2 - x - 1}{3\sqrt{2 + 4x}} \quad (1)$$

$$y = \frac{(2x^2 + 3)\sqrt{x^2 - 3}}{9x^3} \quad (2)$$

$$y = 2(x - 2)\sqrt{1 + e^x} - 2 \ln \frac{\sqrt{1 + e^x} - 1}{\sqrt{1 + e^x} + 1} \quad (3)$$

$$y = \operatorname{arctg} e^x - e^{-x} \quad (4)$$

$$y = \ln \frac{x^2}{\sqrt{1 - ax^4}} \quad (5)$$

$$y = \log_a \frac{1}{1 - x^4} \quad (6)$$

$$y = \operatorname{ctg} \sqrt[3]{5} - \frac{1 \cos^2 4x}{8 \sin 8x} \quad (7)$$

$$y = \frac{\operatorname{tg} \ln 2 \cdot \sin^2 10x}{19 \cos 38x} \quad (8)$$

$$y = \operatorname{arctg} \frac{\sqrt{1 + x^2} - 1}{x} \quad (9)$$

$$y = \frac{2\sqrt{1 - x} \arcsin \sqrt{x}}{x} + \frac{2}{\sqrt{x}} \quad (10)$$

$$y = \frac{1}{8\sqrt{2}} \ln \frac{\sqrt{2} + \operatorname{tg} x}{\sqrt{2} - \operatorname{tg} x} - \frac{\operatorname{tg} x}{4(2 - \operatorname{tg}^2 x)} \quad (11)$$

$$y = \frac{1}{\sqrt{8}} \ln \frac{4 + \sqrt{8} \operatorname{tg} \frac{x}{2}}{4 - \sqrt{8} \operatorname{tg} \frac{x}{2}} \quad (12)$$

Задание №20

Найти производную:

$$y = \frac{(1 + x^8)\sqrt{1 + x^8}}{12x^{12}} \quad (1)$$

$$y = \frac{x - 1}{(x^2 + 5)\sqrt{x^2 + 5}} \quad (2)$$

$$y = \frac{1}{\ln 4} \ln \frac{1 + 2^x}{1 - 2^x} \quad (3)$$

$$y = x - \ln(1 + e^x) - 2e^{x/2} \operatorname{arctg} e^{x/2} - (\operatorname{arctg} e^{x/2})^2 \quad (4)$$

$$y = \ln(\sqrt{x} + \sqrt{x + 1}) \quad (5)$$

$$y = \frac{1}{\sqrt{2}} \ln(\sqrt{2} \operatorname{tg} x + \sqrt{1 + 2 \operatorname{tg}^2 x}) \quad (6)$$

$$y = \frac{\cos \sin 5 \cdot \sin^2 2x}{2 \cos 4x} \quad (7)$$

$$y = \operatorname{ctg} \cos 5 - \frac{1 \cos^2 20x}{40 \sin 40x} \quad (8)$$

$$y = \arccos \frac{x^2 - 4}{\sqrt{x^4 + 16}} \quad (9)$$

$$y = \frac{2x - 5}{4} \sqrt{5x - 4 - x^2} + \frac{9}{4} \arcsin \sqrt{\frac{x - 1}{3}} \quad (10)$$

$$y = \frac{1}{2} \operatorname{tg} x + \frac{1}{4\sqrt{2}} \ln \frac{1 + \sqrt{2} \operatorname{tg} x}{1 - \sqrt{2} \operatorname{tg} x} \quad (11)$$

$$y = \left[\frac{1}{4} \ln \left| \operatorname{tg} \frac{x}{2} \right| + \frac{1}{4} \ln \frac{3 + \cos x}{\sin x} \right] \quad (12)$$

Задание №21

Найти производную:

$$y = \frac{x^2}{2\sqrt{1-3x^4}} \quad (1)$$

$$y = \frac{(2x+1)\sqrt{x^2-x}}{x^2} \quad (2)$$

$$y = 2\sqrt{e^x+1} + \ln \frac{\sqrt{e^x+1}-1}{\sqrt{e^x+1}+1} \quad (3)$$

$$y = \frac{e^{x^3}}{1+x^3} \quad (4)$$

$$y = \ln \frac{a^2+x^2}{a^2-x^2} \quad (5)$$

$$y = \ln \arcsin \sqrt{1-e^{2x}} \quad (6)$$

$$y = \frac{\sin \cos 3 \cdot \cos^2 2x}{4 \sin 4x} \quad (7)$$

$$y = \sqrt{\operatorname{tg} 4} + \frac{\sin^2 21x}{21 \cos 42x} \quad (8)$$

$$y = \sqrt{\frac{2}{3} \operatorname{arctg} \frac{3x-1}{\sqrt{6x}}} \quad (9)$$

$$y = \operatorname{arctg} x + \frac{5}{6} \ln \frac{x^2+1}{x^2+4} \quad (10)$$

$$y = -\frac{1}{2} \ln \operatorname{tg} \frac{x}{2} - \frac{\cos x}{2 \sin^2 x} \quad (11)$$

$$y = -\frac{1}{4} \arcsin \frac{5+3 \cos x}{3+5 \cos x} \quad (12)$$

Задание №22

Найти производную:

$$y = \frac{(x^2-6)\sqrt{(4+x^2)^3}}{120x^5} \quad (1)$$

$$y = 2\sqrt{\frac{1-\sqrt{x}}{1+\sqrt{x}}} \quad (2)$$

$$y = \frac{2}{3} \sqrt{(\operatorname{arctg} e^x)^3} \quad (3)$$

$$y = \frac{1}{m\sqrt{ab}} \operatorname{arctg} \left(e^{mx} \sqrt{\frac{a}{b}} \right) \quad (4)$$

$$y = \ln^2 x + \cos x \quad (5)$$

$$y = \ln \arccos \sqrt{1-e^{4x}} \quad (6)$$

$$y = \frac{\cos \ln 7 \cdot \sin^2 7x}{7 \cos 14x} \quad (7)$$

$$y = \cos \ln 13 - \frac{1}{44} \frac{\cos^2 20x}{\sin 44x} \quad (8)$$

$$y = \frac{1}{4} \ln x - 1x + 1 - \frac{1}{2} \operatorname{arctg} x \quad (9)$$

$$y = \sqrt{1-x^2} - x \arcsin \sqrt{1-x^2} \quad (10)$$

$$y = \frac{1}{2a\sqrt{1+a^2}} \ln \frac{a+\sqrt{1+a^2} \operatorname{tg} x}{a-\sqrt{1+a^2} \operatorname{tg} x} \quad (11)$$

$$y = \frac{1-8 \cos^2 x}{4 \cos^4 x} \quad (12)$$

Задание №23

Найти производную:

$$y = \frac{(x^2 - 8)\sqrt{x^2 - 8}}{6x^3} \quad (1)$$

$$y = \frac{1}{(x+2)\sqrt{x^2+4x+5}} \quad (2)$$

$$y = \frac{1}{2} \ln e^{2x} + 1 - 2 \operatorname{arctg} e^x \quad (3)$$

$$y = 3e^{\sqrt[3]{x}} (\sqrt[3]{x^2} - 2\sqrt[3]{x} + 2) \quad (4)$$

$$y = \ln^3(1 + \cos x) \quad (5)$$

$$y = \ln bx + \sqrt{a^2 + b^2 x^2} \quad (6)$$

$$y = \cos \operatorname{ctg} 2 - \frac{1}{16} \frac{\cos^2 8x}{16 \cos^2 16x} \quad (7)$$

$$y = \ln \cos \frac{1}{3} + \frac{\sin^2 23x}{23 \cos 46x} \quad (8)$$

$$y = \frac{(x-4)\sqrt{8x-x^2-7}}{2} - 9 \arccos \sqrt{\frac{x-1}{6}} \quad (9)$$

$$y = \arcsin \frac{x-2}{(x-1)\sqrt{2}} \quad (10)$$

$$y = \frac{1}{18\sqrt{2}} \ln \frac{1+\sqrt{2} \cot x}{1-\sqrt{2} \cot x} \quad (11)$$

$$y = \frac{2}{\sin x} - \frac{1}{3 \cos^3 x} + \frac{\sin x}{2 \cos^2 x} + \frac{5}{2} \operatorname{arctg} \sin x \quad (12)$$

Задание №24

Найти производную:

$$y = \frac{4 + 3x^3}{x \sqrt[3]{(2+x^3)^2}} \quad (1)$$

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

$$y = \ln(e^x + 1) + \frac{18e^{2x} + 27e^x + 11}{6(e^x + 1)^3} \quad (3)$$

$$y = \ln \frac{\sqrt{1+e^x+e^{2x}} - e^x - 1}{\sqrt{1+e^x+e^{2x}} - e^x + 1} \quad (4)$$

$$y = \ln \frac{x^2}{1-x^2} \quad (5)$$

$$y = \ln \frac{\sqrt{x^2+1} + x\sqrt{2}}{\sqrt{x^2+1} - x\sqrt{2}} \quad (6)$$

$$y = \operatorname{ctg} \cos 2 + \frac{1}{6} \frac{\sin^2 6x}{\cos 12} \quad (7)$$

$$y = \operatorname{ctg} \sin \frac{1}{13} - \frac{1}{48} \frac{\cos^2 24x}{\sin 48} \quad (8)$$

$$y = \frac{(1+x) \operatorname{arctg} \sqrt{x}}{x^2} + \frac{1}{3x\sqrt{x}} \quad (9)$$

$$y = \sqrt{3} + \frac{1}{3} \operatorname{arctg} \sqrt{x} - \frac{8}{3} \operatorname{arctg} \frac{\sqrt{x}}{2} \quad (10)$$

$$y = \operatorname{arctg} \frac{\sqrt{\sin 2x}}{\operatorname{ch} x - \operatorname{sh} x} \quad (11)$$

$$y = \frac{8}{3} \cot 2x - \frac{1}{3 \cos x \sin^3 x} \quad (12)$$

Задание №25

Найти производную:

$$y = \sqrt[3]{\frac{(1+x^{3/4})^2}{x^{3/2}}} \quad (1)$$

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

$$y = 2\frac{\sqrt{2^x-1} - \operatorname{arctg} \sqrt{2^x-1}}{\ln 2} \quad (3)$$

$$y = e^{\sin x} \left(x - \frac{1}{\cos x} \right) \quad (4)$$

$$y = \ln \operatorname{tg} \left(\frac{\pi}{4} + \frac{x}{2} \right) \quad (5)$$

$$y = \ln(\operatorname{arccos} \frac{1}{\sqrt{x}}) \quad (6)$$

$$y = \sqrt[3]{\operatorname{ctg} 2} - \frac{1}{20} \frac{\cos^2 10x}{\sin 20x} \quad (7)$$

$$y = \sin \ln \frac{1}{2} + \frac{\sin^2 25x}{25 \cos 50x} \quad (8)$$

$$y = \frac{x^3}{3} \operatorname{arccos} x - \frac{2+x^2}{9} \sqrt{1-x^2} \quad (9)$$

$$y = \operatorname{arctg} \frac{\sqrt{1-x}}{1-\sqrt{x}} \quad (10)$$

$$y = \frac{1}{6} \ln \frac{1-\sin 2x}{2+\sin 2x} \quad (11)$$

$$y = \frac{1}{2} \operatorname{arctg}(\sin x) - \frac{\sin x}{2 \cos^2 x} \quad (12)$$

Задание №26

Найти производную:

$$y = \frac{x^6 + x^3 - 2}{\sqrt{1-x^3}} \quad (1)$$

$$y = \frac{x+7}{6\sqrt{x^2+2x+7}} \quad (2)$$

$$y = \frac{e^{\alpha x}(\alpha \sin \beta x - \beta \cos \beta x)}{\alpha^2 + \beta^2} \quad (3)$$

$$y = \frac{e^x}{2} [(x-1)^2 \cos x + (x-1)^2 \sin x] \quad (4)$$

$$y = \ln \sqrt[4]{\frac{1+2x}{1-2x}} \quad (5)$$

$$y = \ln \operatorname{arccos} \sqrt{1-e^{4x}} \quad (6)$$

$$y = \frac{1}{3} \cos \operatorname{tg} 12 + \frac{1}{10} \frac{\sin^2 10x}{\cos 20x} \quad (7)$$

$$y = \sqrt[3]{\cos \sqrt{2}} - \frac{1}{52} \frac{\cos^2 26x}{\sin 52x} \quad (8)$$

$$y = \frac{1}{2\sqrt{x}} + \frac{1+x}{2x} \operatorname{arctg} \sqrt{x} \quad (9)$$

$$y = (2x^2 + 6x + 5) \operatorname{arctg} \frac{x+1}{x+2} - x \quad (10)$$

$$y = \sqrt[4]{\frac{1+\operatorname{tg} x}{1-\operatorname{tg} x}} \quad (11)$$

$$y = \frac{3}{2} \ln \operatorname{tg} \frac{x}{2} + \cos x - \frac{\cos x}{2 \sin^2 x} \quad (12)$$

Задание №27

Найти производную:

$$y = \frac{(x^2 - 2)\sqrt{4 + x^2}}{24x^3} \quad (1)$$

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

$$y = \frac{e^{\alpha x}(\beta \sin \beta x + \alpha \cos \beta x)}{\alpha^2 + \beta^2} \quad (3)$$

$$y = 3e^{\sqrt[3]{x}}[\sqrt[3]{x^5} - 5\sqrt[3]{x^4} + 20x - 60\sqrt[3]{x^2} + 120\sqrt[3]{x} - 120] \quad (4)$$

$$y = x + \frac{1}{\sqrt{2}} \ln\left(\frac{x - \sqrt{2}}{x + \sqrt{2}}\right) \quad (5)$$

$$y = \ln \frac{\sqrt{5} + \operatorname{tg} \frac{x}{2}}{\sqrt{5} - \operatorname{tg} \frac{x}{2}} \quad (6)$$

$$y = \ln \sin \frac{1}{3} - \frac{1}{24} \frac{\cos^2 12x}{\sin 24x} \quad (7)$$

$$y = \sqrt[7]{\operatorname{tg} \cos 2} + \frac{\sin^2 27x}{27 \cos 54x} \quad (8)$$

$$y = \frac{3+x}{2} \sqrt{x(2-x)} + 3 \arccos \sqrt{\frac{x}{2}} \quad (9)$$

$$y = \frac{x}{2\sqrt{1-4x^2}} \arcsin 2x + \frac{1}{8} \ln(1-4x^2) \quad (10)$$

$$y = \frac{\sin x}{1 + \cos x} \quad (11)$$

$$y = -\frac{\sin x}{2 \cos^2 x} - \frac{1}{\sin x} - \frac{3}{2} \operatorname{arctg} \sin x \quad (12)$$

Задание №28

Найти производную:

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

$$y = \frac{x^2 + 2}{2\sqrt{1 - x^4}} \quad (2)$$

$$y = e^{ax} \left[\frac{1}{2a} + \frac{a \cos 2bx + 2b \sin 2bx}{2(a^2 + 4b^2)} \right] \quad (3)$$

$$y = -\frac{e^{3x}}{3 \sin^3 x} \quad (4)$$

$$y = \ln \sin \frac{2x + 4}{x + 1} \quad (5)$$

$$y = \ln \frac{\ln x}{\sin \frac{1}{x}} \quad (6)$$

$$y = 8 \sin \operatorname{ctg} 3 + \frac{1}{5} \frac{\sin^2 5x}{\cos 10x} \quad (7)$$

$$y = \sin \sqrt[3]{\operatorname{tg} 2} - \frac{\cos^2 28x}{56 \sin 56x} \quad (8)$$

$$y = \frac{4 + x^4}{x^3} \operatorname{arctg} \frac{x^2}{2} + \frac{4}{x} \quad (9)$$

$$y = \left(2x^2 - x - \frac{1}{2} \right) \operatorname{arctg} \frac{x^2 - 1}{x\sqrt{3}} - \frac{x^3}{2\sqrt{3}} - \frac{\sqrt{3}}{2} x \quad (10)$$

$$y = \frac{\cos x}{\sqrt{\sin 2x}} \quad (11)$$

$$y = \frac{\sin x}{2 \cos^2 x} + \frac{1}{2} \operatorname{arctg}(\sin x) \quad (12)$$

Задание №29

Найти производную:

$$y = \frac{\sqrt{x-1}(3x+2)}{4x^2} \quad (1)$$

$$y = \frac{(x+3)\sqrt{2x-1}}{2x+7} \quad (2)$$

$$y = x + \frac{1}{1+e^x} - \ln(1+e^x) \quad (3)$$

$$y = \arcsin e^x - \sqrt{1-e^{2x}} \quad (4)$$

$$y = \log_{16} \log_5 \operatorname{tg} x \quad (5)$$

$$y = \ln \ln \sin \left(1 + \frac{1}{x}\right) \quad (6)$$

$$y = \frac{\cos \operatorname{ctg} 3 \cdot \cos^2 14x}{28 \sin 28x} \quad (7)$$

$$y = \cos^2 \sin 3 + \frac{\sin^2 29x}{29 \cos 58x} \quad (8)$$

$$y = \arcsin \sqrt{\frac{x}{x+1}} + \operatorname{arctg} \sqrt{x} \quad (9)$$

$$y = (x + 2\sqrt{x} + 2) \operatorname{arctg} \frac{\sqrt{x}}{\sqrt{x}+2} - \sqrt{x} \quad (10)$$

$$y = \frac{\sin 3x}{\sqrt{\cos 6x}} \quad (11)$$

$$y = \frac{1}{2} \left[\frac{\sin x}{\cos^2 x} + \operatorname{arctg}(\sin x) \right] \quad (12)$$

Задание №30

Найти производную:

$$y = \frac{\sqrt{(1+x^2)^3}}{3x^3} \quad (1)$$

$$y = \frac{3x + \sqrt{x}}{\sqrt{x^2+2}} \quad (2)$$

$$y = x - 3 \ln(1 + e^{\frac{x}{6}}) \sqrt{1 + e^{2x}} - 3 \operatorname{arctg} e^{\frac{x}{6}} \quad (3)$$

$$y = -\frac{1}{2} e^{-x^2} (x^4 + 2x^2 + 2) \quad (4)$$

$$y = \log_4 \log_2 \operatorname{tg} x \quad (5)$$

$$y = \ln \ln^3 \ln^5 x \quad (6)$$

$$y = \frac{\cos \operatorname{tg} \frac{1}{3} \cdot \sin^2 15x}{15 \cos 30x} \quad (7)$$

$$y = \sin^3 \cos 2 - \frac{\cos^2 30x}{60 \sin 60x} \quad (8)$$

$$y = \frac{1}{2} \sqrt{\frac{1}{x^2} - 1} - \frac{\arccos x}{2x^2} \quad (9)$$

$$y = \sqrt{1+2x-x^2} \arcsin \frac{z\sqrt{2}}{1+x} - \sqrt{2} \ln(1+x) \quad (10)$$

$$y = \frac{1 + 8 \cos^2 x \ln \cos x}{2 \cos^2 x} \quad (11)$$

$$y = -\frac{\cos x}{2 \sin^2 x} - \frac{1}{2} \ln \operatorname{tg} \frac{x}{2} \quad (12)$$

Задание №31

Найти производную:

$$y = \frac{2(3x^3 + 4x^2 - x - 2)}{15\sqrt{1+x}} \quad (1)$$

$$y = \frac{x^6 + 8x^3 - 128}{\sqrt{8-x^3}} \quad (2)$$

$$y = x - \ln(2 + e^x + 2\sqrt{e^{2x} + e^x + 1}) \quad (3)$$

$$y = x + \frac{8}{1 + e^{x/4}} \quad (4)$$

$$y = \sqrt{x} \ln(\sqrt{x} + \sqrt{x+a}) - \sqrt{x+a} \quad (5)$$

$$y = \frac{x(\cos \ln x + \sin \ln x)}{2} \quad (6)$$

$$y = \sin \sqrt{3} + \frac{1}{3} \frac{\sin^2 3x}{\cos 6x} \quad (7)$$

$$y = \frac{\sin \operatorname{tg}(\frac{1}{5}) \cdot \cos^2 16x}{32 \sin 32} \quad (8)$$

$$y = \operatorname{arctg} \frac{\operatorname{tg} x - \operatorname{ctg} x}{\sqrt{2}} \quad (9)$$

$$y = 6 \operatorname{arcsin} \frac{\sqrt{x}}{2} - \frac{6+x}{2} \sqrt{x(4-x)} \quad (10)$$

$$y = \frac{1}{4\sqrt{5}} \ln \frac{2 + \sqrt{5} \operatorname{tg} x}{2 - \sqrt{5} \operatorname{tg} x} \quad (11)$$

$$y = -\frac{\sin x}{2 \cos^2 x} + \frac{4}{3} \operatorname{arccos} \operatorname{ctg} x \quad (12)$$

Задание №32

Найти производную:

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

$$y = \frac{\sqrt{2x+3}(x-2)}{x^2} \quad (2)$$

$$y = \frac{e^{2x}(2 - \sin 2x - \cos 2x)}{8x} \quad (3)$$

$$y = \ln(e^x + \sqrt{e^{2x}-1}) + \operatorname{arcsin} e^{-x} \quad (4)$$

$$y = \ln x + \sqrt{a^2 + x^2} \quad (5)$$

$$y = \ln \cos \frac{2x+3}{2x+1} \quad (6)$$

$$y = \cos \ln 2 - \frac{1}{3} \frac{\cos^2 3x}{\sin 6x} \quad (7)$$

$$y = \frac{\operatorname{ctg} \sin(\frac{1}{3}) \cdot \sin^2 21x}{17 \sin 34x} \quad (8)$$

$$y = \operatorname{arcsin} \frac{\sqrt{x}-2}{\sqrt{5x}} \quad (9)$$

$$y = \frac{x-3}{2} \sqrt{6x-x^2-8} + \operatorname{arcsin} \sqrt{\frac{x}{2}-1} \quad (10)$$

$$y = \frac{\sin x}{4 \cos^4 x} + \frac{3 \sin x}{8 \cos^2 x} + \frac{3}{8} \operatorname{arctg} \sin x \quad (11)$$

$$y = -\frac{\cos x}{2 \cos^2 x} + \frac{3}{2} \operatorname{arcsin} \operatorname{tg} x \quad (12)$$

Задание №33

Найти производную:

$$y = \frac{x^4 - 8x^2}{2(x^2 - 4)} \quad (1)$$

$$y = (1 - x^2) \sqrt[5]{x^3 + \frac{1}{x}} \quad (2)$$

$$y = \frac{1}{2} \operatorname{arctg} \frac{e^x - 3}{2} \quad (3)$$

$$y = x - e^{-x} \arcsin e^x - \ln(1 + \sqrt{1 - e^{2x}}) \quad (4)$$

$$y = 2\sqrt{x} - 4 \ln(2 + \sqrt{x}) \quad (5)$$

$$y = \lg \ln \operatorname{ctg} x \quad (6)$$

$$y = \operatorname{tg} \lg \frac{1}{3} + \frac{1 \sin^2 4x}{4 \cos 8x} \quad (7)$$

$$y = \frac{\sqrt[5]{\operatorname{ctg} 2} \cdot \cos^2 18x}{36 \sin 36x} \quad (8)$$

$$y = \frac{2x - 1}{4} \sqrt{2 + x - x^2} + \frac{9}{8} \arcsin \frac{2x - 1}{3} \quad (9)$$

$$y = \frac{(1 + x) \operatorname{arctg} \sqrt{x} - \sqrt{x}}{x} \quad (10)$$

$$y = \frac{1}{2} \ln \frac{1 + \sqrt{\operatorname{tg} x}}{1 - \sqrt{\operatorname{tg} x}} - \operatorname{arctg} \sqrt{\operatorname{tg} x} \quad (11)$$

$$y = \frac{1}{\sqrt{8}} \arcsin \frac{3 + \cos x}{1 + 3 \cos x} \quad (12)$$

Задание №34

Найти производную:

$$y = \frac{2x^2 - x - 1}{3\sqrt{2 + 4x}} \quad (1)$$

$$y = \frac{(2x^2 + 3)\sqrt{x^2 - 3}}{9x^3} \quad (2)$$

$$y = 2(x - 2)\sqrt{1 + e^x} - 2 \ln \frac{\sqrt{1 + e^x} - 1}{\sqrt{1 + e^x} + 1} \quad (3)$$

$$y = \operatorname{arctg} e^x - e^{-x} \quad (4)$$

$$y = \ln \frac{x^2}{\sqrt{1 - ax^4}} \quad (5)$$

$$y = \log_a \frac{1}{1 - x^4} \quad (6)$$

$$y = \operatorname{ctg} \sqrt[3]{5} - \frac{1 \cos^2 4x}{8 \sin 8x} \quad (7)$$

$$y = \frac{\operatorname{tg} \ln 2 \cdot \sin^2 10x}{19 \cos 38x} \quad (8)$$

$$y = \operatorname{arctg} \frac{\sqrt{1 + x^2} - 1}{x} \quad (9)$$

$$y = \frac{2\sqrt{1 - x} \arcsin \sqrt{x}}{x} + \frac{2}{\sqrt{x}} \quad (10)$$

$$y = \frac{1}{8\sqrt{2}} \ln \frac{\sqrt{2} + \operatorname{tg} x}{\sqrt{2} - \operatorname{tg} x} - \frac{\operatorname{tg} x}{4(2 - \operatorname{tg}^2 x)} \quad (11)$$

$$y = \frac{1}{\sqrt{8}} \ln \frac{4 + \sqrt{8} \operatorname{tg} \frac{x}{2}}{4 - \sqrt{8} \operatorname{tg} \frac{x}{2}} \quad (12)$$

Задание №35

Найти производную:

$$y = \frac{(1+x^8)\sqrt{1+x^8}}{12x^{12}} \quad (1)$$

$$y = \frac{x-1}{(x^2+5)\sqrt{x^2+5}} \quad (2)$$

$$y = \frac{1}{\ln 4} \ln \frac{1+2^x}{1-2^x} \quad (3)$$

$$y = x - \ln(1+e^x) - 2e^{x/2} \operatorname{arctg} e^{x/2} - (\operatorname{arctg} e^{x/2})^2 \quad (4)$$

$$y = \ln(\sqrt{x} + \sqrt{x+1}) \quad (5)$$

$$y = \frac{1}{\sqrt{2}} \ln(\sqrt{2} \operatorname{tg} x + \sqrt{1+2 \operatorname{tg}^2 x}) \quad (6)$$

$$y = \frac{\cos 5 \cdot \sin^2 2x}{2 \cos 4x} \quad (7)$$

$$y = \operatorname{ctg} \cos 5 - \frac{1}{40} \frac{\cos^2 20x}{\sin 40x} \quad (8)$$

$$y = \arccos \frac{x^2-4}{\sqrt{x^4+16}} \quad (9)$$

$$y = \frac{2x-5}{4} \sqrt{5x-4-x^2} + \frac{9}{4} \arcsin \sqrt{\frac{x-1}{3}} \quad (10)$$

$$y = \frac{1}{2} \operatorname{tg} x + \frac{1}{4\sqrt{2}} \ln \frac{1+\sqrt{2} \operatorname{tg} x}{1-\sqrt{2} \operatorname{tg} x} \quad (11)$$

$$y = \left[\frac{1}{4} \ln \left| \operatorname{tg} \frac{x}{2} \right| + \frac{1}{4} \ln \frac{3+\cos x}{\sin x} \right] \quad (12)$$

Задание №36

Найти производную:

$$y = \frac{x^2}{2\sqrt{1-3x^4}} \quad (1)$$

$$y = \frac{(2x+1)\sqrt{x^2-x}}{x^2} \quad (2)$$

$$y = 2\sqrt{e^x+1} + \ln \frac{\sqrt{e^x+1}-1}{\sqrt{e^x+1}+1} \quad (3)$$

$$y = \frac{e^{x^3}}{1+x^3} \quad (4)$$

$$y = \ln \frac{a^2+x^2}{a^2-x^2} \quad (5)$$

$$y = \ln \arcsin \sqrt{1-e^{2x}} \quad (6)$$

$$y = \frac{\sin \cos 3 \cdot \cos^2 2x}{4 \sin 4x} \quad (7)$$

$$y = \sqrt{\operatorname{tg} 4} + \frac{\sin^2 21x}{21 \cos 42x} \quad (8)$$

$$y = \sqrt{\frac{2}{3}} \operatorname{arctg} \frac{3x-1}{\sqrt{6x}} \quad (9)$$

$$y = \operatorname{arctg} x + \frac{5}{6} \ln \frac{x^2+1}{x^2+4} \quad (10)$$

$$y = -\frac{1}{2} \ln \operatorname{tg} \frac{x}{2} - \frac{\cos x}{2 \sin^2 x} \quad (11)$$

$$y = -\frac{1}{4} \arcsin \frac{5+3 \cos x}{3+5 \cos x} \quad (12)$$

Задание №37

Найти производную:

$$y = \frac{(x^2 - 6)\sqrt{(4 + x^2)^3}}{120x^5} \quad (1)$$

$$y = 2\sqrt{\frac{1 - \sqrt{x}}{1 + \sqrt{x}}} \quad (2)$$

$$y = \frac{2}{3}\sqrt{(\operatorname{arctg} e^x)^3} \quad (3)$$

$$y = \frac{1}{m\sqrt{ab}} \operatorname{arctg} \left(e^{mx} \sqrt{\frac{a}{b}} \right) \quad (4)$$

$$y = \ln^2 x + \cos x \quad (5)$$

$$y = \ln \arccos \sqrt{1 - e^{4x}} \quad (6)$$

$$y = \frac{\cos \ln 7 \cdot \sin^2 7x}{7 \cos 14x} \quad (7)$$

$$y = \cos \ln 13 - \frac{1}{44} \frac{\cos^2 20x}{\sin 44x} \quad (8)$$

$$y = \frac{1}{4} \ln x - 1x + 1 - \frac{1}{2} \operatorname{arctg} x \quad (9)$$

$$y = \sqrt{1 - x^2} - x \arcsin \sqrt{1 - x^2} \quad (10)$$

$$y = \frac{1}{2a\sqrt{1 + a^2}} \ln \frac{a + \sqrt{1 + a^2} \operatorname{tg} x}{a - \sqrt{1 + a^2} \operatorname{tg} x} \quad (11)$$

$$y = \frac{1 - 8 \cos^2 x}{4 \cos^4 x} \quad (12)$$

Задание №38

Найти производную:

$$y = \frac{(x^2 - 8)\sqrt{x^2 - 8}}{6x^3} \quad (1)$$

$$y = \frac{1}{(x + 2)\sqrt{x^2 + 4x + 5}} \quad (2)$$

$$y = \frac{1}{2} \ln e^{2x} + 1 - 2 \operatorname{arctg} e^x \quad (3)$$

$$y = 3e^{\sqrt[3]{x}} (\sqrt[3]{x^2} - 2\sqrt[3]{x} + 2) \quad (4)$$

$$y = \ln^3 (1 + \cos x) \quad (5)$$

$$y = \ln bx + \sqrt{a^2 + b^2 x^2} \quad (6)$$

$$y = \cos \operatorname{ctg} 2 - \frac{1}{16} \frac{\cos^2 8x}{16 \cos^2 16x} \quad (7)$$

$$y = \ln \cos \frac{1}{3} + \frac{\sin^2 23x}{23 \cos 46x} \quad (8)$$

$$y = \frac{(x - 4)\sqrt{8x - x^2 - 7}}{2} - 9 \arccos \sqrt{\frac{x - 1}{6}} \quad (9)$$

$$y = \arcsin \frac{x - 2}{(x - 1)\sqrt{2}} \quad (10)$$

$$y = \frac{1}{18\sqrt{2}} \ln \frac{1 + \sqrt{2} \cot x}{1 - \sqrt{2} \cot x} \quad (11)$$

$$y = \frac{2}{\sin x} - \frac{1}{3 \cos^3 x} + \frac{\sin x}{2 \cos^2 x} + \frac{5}{2} \operatorname{arctg} \sin x \quad (12)$$

Задание №39

Найти производную:

$$y = \frac{4 + 3x^3}{x\sqrt[3]{(2+x^3)^2}} \quad (1)$$

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

$$y = \ln(e^x + 1) + \frac{18e^{2x} + 27e^x + 11}{6(e^x + 1)^3} \quad (3)$$

$$y = \ln \frac{\sqrt{1+e^x+e^{2x}} - e^x - 1}{\sqrt{1+e^x+e^{2x}} + e^x + 1} \quad (4)$$

$$y = \ln \frac{x^2}{1-x^2} \quad (5)$$

$$y = \ln \frac{\sqrt{x^2+1} + x\sqrt{2}}{\sqrt{x^2+1} + x\sqrt{2}} \quad (6)$$

$$y = \operatorname{ctg} \cos 2 + \frac{1}{6} \frac{\sin^2 6x}{\cos 12} \quad (7)$$

$$y = \operatorname{ctg} \sin \frac{1}{13} - \frac{1}{48} \frac{\cos^2 24x}{\sin 48} \quad (8)$$

$$y = \frac{(1+x) \operatorname{arctg} \sqrt{x}}{x^2} + \frac{1}{3x\sqrt{x}} \quad (9)$$

$$y = \sqrt{3} + \frac{1}{3} \operatorname{arctg} \sqrt{x} - \frac{8}{3} \operatorname{arctg} \frac{\sqrt{x}}{2} \quad (10)$$

$$y = \operatorname{arctg} \frac{\sqrt{\sin 2x}}{\operatorname{ch} x - \operatorname{sh} x} \quad (11)$$

$$y = \frac{8}{3} \cot 2x - \frac{1}{3 \cos x \sin^3 x} \quad (12)$$

Задание №40

Найти производную:

$$y = \sqrt[3]{\frac{(1+x^{3/4})^2}{x^{3/2}}} \quad (1)$$

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

$$y = 2\frac{\sqrt{2^x-1} - \operatorname{arctg} \sqrt{2^x-1}}{\ln 2} \quad (3)$$

$$y = e^{\sin x} \left(x - \frac{1}{\cos x} \right) \quad (4)$$

$$y = \ln \operatorname{tg} \left(\frac{\pi}{4} + \frac{x}{2} \right) \quad (5)$$

$$y = \ln(\operatorname{arccos} \frac{1}{\sqrt{x}}) \quad (6)$$

$$y = \sqrt[3]{\operatorname{ctg} 2} - \frac{1}{20} \frac{\cos^2 10x}{\sin 20x} \quad (7)$$

$$y = \sin \ln \frac{1}{2} + \frac{\sin^2 25x}{25 \cos 50x} \quad (8)$$

$$y = \frac{x^3}{3} \operatorname{arccos} x - \frac{2+x^2}{9} \sqrt{1-x^2} \quad (9)$$

$$y = \operatorname{arctg} \frac{\sqrt{1-x}}{1-\sqrt{x}} \quad (10)$$

$$y = \frac{1}{6} \ln \frac{1-\sin 2x}{2+\sin 2x} \quad (11)$$

$$y = \frac{1}{2} \operatorname{arctg}(\sin x) - \frac{\sin x}{2 \cos^2 x} \quad (12)$$

Задание №41

Найти производную:

$$y = \frac{x^6 + x^3 - 2}{\sqrt{1 - x^3}} \quad (1)$$

$$y = \frac{x + 7}{6\sqrt{x^2 + 2x + 7}} \quad (2)$$

$$y = \frac{e^{\alpha x}(\alpha \sin \beta x - \beta \cos \beta x)}{\alpha^2 + \beta^2} \quad (3)$$

$$y = \frac{e^x}{2} [(x - 1)^2 \cos x + (x - 1)^2 \sin x] \quad (4)$$

$$y = \ln \sqrt[4]{\frac{1 + 2x}{1 - 2x}} \quad (5)$$

$$y = \ln \arccos \sqrt{1 - e^{4x}} \quad (6)$$

$$y = \frac{1}{3} \cos \operatorname{tg} 12 + \frac{1}{10} \frac{\sin^2 10x}{\cos 20x} \quad (7)$$

$$y = \sqrt[3]{\cos \sqrt{2}} - \frac{1}{52} \frac{\cos^2 26x}{\sin 52x} \quad (8)$$

$$y = \frac{1}{2\sqrt{x}} + \frac{1+x}{2x} \operatorname{arctg} \sqrt{x} \quad (9)$$

$$y = (2x^2 + 6x + 5) \operatorname{arctg} \frac{x+1}{x+2} - x \quad (10)$$

$$y = \sqrt[4]{\frac{1 + \operatorname{tg} x}{1 - \operatorname{tg} x}} \quad (11)$$

$$y = \frac{3}{2} \ln \operatorname{tg} \frac{x}{2} + \cos x - \frac{\cos x}{2 \sin^2 x} \quad (12)$$

Задание №42

Найти производную:

$$y = \frac{(x^2 - 2)\sqrt{4 + x^2}}{24x^3} \quad (1)$$

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

$$y = \frac{e^{\alpha x}(\beta \sin \beta x + \alpha \cos \beta x)}{\alpha^2 + \beta^2} \quad (3)$$

$$y = 3e^{\sqrt[3]{x}} [\sqrt[3]{x^5} - 5\sqrt[3]{x^4} + 20x - 60\sqrt[3]{x^2} + 120\sqrt[3]{x} - 120] \quad (4)$$

$$y = x + \frac{1}{\sqrt{2}} \ln \left(\frac{x - \sqrt{2}}{x + \sqrt{2}} \right) \quad (5)$$

$$y = \ln \frac{\sqrt{5} + \operatorname{tg} \frac{x}{2}}{\sqrt{5} - \operatorname{tg} \frac{x}{2}} \quad (6)$$

$$y = \ln \sin \frac{1}{3} - \frac{1}{24} \frac{\cos^2 12x}{\sin 24x} \quad (7)$$

$$y = \sqrt[7]{\operatorname{tg} \cos 2} + \frac{\sin^2 27x}{27 \cos 54x} \quad (8)$$

$$y = \frac{3+x}{2} \sqrt{x(2-x)} + 3 \arccos \sqrt{\frac{x}{2}} \quad (9)$$

$$y = \frac{x}{2\sqrt{1-4x^2}} \arcsin 2x + \frac{1}{8} \ln(1-4x^2) \quad (10)$$

$$y = \frac{\sin x}{1 + \cos x} \quad (11)$$

$$y = -\frac{\sin x}{2 \cos^2 x} - \frac{1}{\sin x} - \frac{3}{2} \operatorname{arctg} \sin x \quad (12)$$

Задание №43

Найти производную:

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

$$y = \frac{x^2+2}{2\sqrt{1-x^4}} \quad (2)$$

$$y = e^{ax} \left[\frac{1}{2a} + \frac{a \cos 2bx + 2b \sin 2bx}{2(a^2 + 4b^2)} \right] \quad (3)$$

$$y = -\frac{e^{3x}}{3 \sin^3 x} \quad (4)$$

$$y = \ln \sin \frac{2x+4}{x+1} \quad (5)$$

$$y = \ln \frac{\ln x}{\sin \frac{1}{x}} \quad (6)$$

$$y = 8 \sin \operatorname{ctg} 3 + \frac{1}{5} \frac{\sin^2 5x}{\cos 10x} \quad (7)$$

$$y = \sin \sqrt[3]{\operatorname{tg} 2} - \frac{\cos^2 28x}{56 \sin 56x} \quad (8)$$

$$y = \frac{4+x^4}{x^3} \operatorname{arctg} \frac{x^2}{2} + \frac{4}{x} \quad (9)$$

$$y = \left(2x^2 - x - \frac{1}{2} \right) \operatorname{arctg} \frac{x^2-1}{x\sqrt{3}} - \frac{x^3}{2\sqrt{3}} - \frac{\sqrt{3}}{2} x \quad (10)$$

$$y = \frac{\cos x}{\sqrt{\sin 2x}} \quad (11)$$

$$y = \frac{\sin x}{2 \cos^2 x} + \frac{1}{2} \operatorname{arctg}(\sin x) \quad (12)$$

Задание №44

Найти производную:

$$y = \frac{\sqrt{x-1}(3x+2)}{4x^2} \quad (1)$$

$$y = \frac{(x+3)\sqrt{2x-1}}{2x+7} \quad (2)$$

$$y = x + \frac{1}{1+e^x} - \ln(1+e^x) \quad (3)$$

$$y = \arcsin e^x - \sqrt{1-e^{2x}} \quad (4)$$

$$y = \log_{16} \log_5 \operatorname{tg} x \quad (5)$$

$$y = \ln \ln \sin \left(1 + \frac{1}{x} \right) \quad (6)$$

$$y = \frac{\cos \operatorname{ctg} 3 \cdot \cos^2 14x}{28 \sin 28x} \quad (7)$$

$$y = \cos^2 \sin 3 + \frac{\sin^2 29x}{29 \cos 58x} \quad (8)$$

$$y = \arcsin \sqrt{\frac{x}{x+1}} + \operatorname{arctg} \sqrt{x} \quad (9)$$

$$y = (x + 2\sqrt{x} + 2) \operatorname{arctg} \frac{\sqrt{x}}{\sqrt{x}+2} - \sqrt{x} \quad (10)$$

$$y = \frac{\sin 3x}{\sqrt{\cos 6x}} \quad (11)$$

$$y = \frac{1}{2} \left[\frac{\sin x}{\cos^2 x} + \operatorname{arctg}(\sin x) \right] \quad (12)$$

Задание №45

Найти производную:

$$y = \frac{\sqrt{(1+x^2)^3}}{3x^3} \quad (1)$$

$$y = \frac{3x + \sqrt{x}}{\sqrt{x^2 + 2}} \quad (2)$$

$$y = x - 3 \ln(1 + e^{\frac{x}{6}}) \sqrt{1 + e^{2x}} - 3 \operatorname{arctg} e^{\frac{x}{6}} \quad (3)$$

$$y = -\frac{1}{2} e^{-x^2} (x^4 + 2x^2 + 2) \quad (4)$$

$$y = \log_4 \log_2 \operatorname{tg} x \quad (5)$$

$$y = \ln \ln^3 \ln^5 x \quad (6)$$

$$y = \frac{\cos \operatorname{tg} \frac{1}{3} \cdot \sin^2 15x}{15 \cos 30x} \quad (7)$$

$$y = \sin^3 \cos 2 - \frac{\cos^2 30x}{60 \sin 60x} \quad (8)$$

$$y = \frac{1}{2} \sqrt{\frac{1}{x^2} - 1} - \frac{\arccos x}{2x^2} \quad (9)$$

$$y = \sqrt{1 + 2x - x^2} \arcsin \frac{z\sqrt{2}}{1+x} - \sqrt{2} \ln(1+x) \quad (10)$$

$$y = \frac{1 + 8 \cos^2 x \ln \cos x}{2 \cos^2 x} \quad (11)$$

$$y = -\frac{\cos x}{2 \sin^2 x} - \frac{1}{2} \ln \operatorname{tg} \frac{x}{2} \quad (12)$$

Задание №46

Найти производную:

$$y = \frac{2(3x^3 + 4x^2 - x - 2)}{15\sqrt{1+x}} \quad (1)$$

$$y = \frac{x^6 + 8x^3 - 128}{\sqrt{8-x^3}} \quad (2)$$

$$y = x - \ln(2 + e^x + 2\sqrt{e^{2x} + e^x + 1}) \quad (3)$$

$$y = x + \frac{8}{1 + e^{x/4}} \quad (4)$$

$$y = \sqrt{x} \ln(\sqrt{x} + \sqrt{x+a}) - \sqrt{x+a} \quad (5)$$

$$y = \frac{x(\cos \ln x + \sin \ln x)}{2} \quad (6)$$

$$y = \sin \sqrt{3} + \frac{1}{3} \frac{\sin^2 3x}{\cos 6x} \quad (7)$$

$$y = \frac{\sin \operatorname{tg}(\frac{1}{5}) \cdot \cos^2 16x}{32 \sin 32} \quad (8)$$

$$y = \operatorname{arctg} \frac{\operatorname{tg} x - \operatorname{ctg} x}{\sqrt{2}} \quad (9)$$

$$y = 6 \arcsin \frac{\sqrt{x}}{2} - \frac{6+x}{2} \sqrt{x(4-x)} \quad (10)$$

$$y = \frac{1}{4\sqrt{5}} \ln \frac{2 + \sqrt{5} \operatorname{tg} x}{2 - \sqrt{5} \operatorname{tg} x} \quad (11)$$

$$y = -\frac{\sin x}{2 \cos^2 x} + \frac{4}{3} \operatorname{arccos} \operatorname{ctg} x \quad (12)$$

Задание №47

Найти производную:

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

$$y = \frac{\sqrt{2x + 3}(x - 2)}{x^2} \quad (2)$$

$$y = \frac{e^{2x}(2 - \sin 2x - \cos 2x)}{8x} \quad (3)$$

$$y = \ln(e^x + \sqrt{e^{2x} - 1}) + \arcsin e^{-x} \quad (4)$$

$$y = \ln x + \sqrt{a^2 + x^2} \quad (5)$$

$$y = \ln \cos \frac{2x + 3}{2x + 1} \quad (6)$$

$$y = \cos \ln 2 - \frac{1}{3} \frac{\cos^2 3x}{\sin 6x} \quad (7)$$

$$y = \frac{\operatorname{ctg} \sin(\frac{1}{3}) \cdot \sin^2 21x}{17 \sin 34x} \quad (8)$$

$$y = \arcsin \frac{\sqrt{x} - 2}{\sqrt{5x}} \quad (9)$$

$$y = \frac{x - 3}{2} \sqrt{6x - x^2 - 8} + \arcsin \sqrt{\frac{x}{2} - 1} \quad (10)$$

$$y = \frac{\sin x}{4 \cos^4 x} + \frac{3 \sin x}{8 \cos^2 x} + \frac{3}{8} \operatorname{arctg} \sin x \quad (11)$$

$$y = -\frac{\cos x}{2 \cos^2 x} + \frac{3}{2} \arcsin \operatorname{tg} x \quad (12)$$

Задание №48

Найти производную:

$$y = \frac{x^4 - 8x^2}{2(x^2 - 4)} \quad (1)$$

$$y = (1 - x^2) \sqrt[5]{x^3 + \frac{1}{x}} \quad (2)$$

$$y = \frac{1}{2} \operatorname{arctg} \frac{e^x - 3}{2} \quad (3)$$

$$y = x - e^{-x} \arcsin e^x - \ln(1 + \sqrt{1 - e^{2x}}) \quad (4)$$

$$y = 2\sqrt{x} - 4 \ln(2 + \sqrt{x}) \quad (5)$$

$$y = \lg \ln \operatorname{ctg} x \quad (6)$$

$$y = \operatorname{tg} \lg \frac{1}{3} + \frac{1}{4} \frac{\sin^2 4x}{\cos 8x} \quad (7)$$

$$y = \frac{\sqrt[5]{\operatorname{ctg} 2} \cdot \cos^2 18x}{36 \sin 36x} \quad (8)$$

$$y = \frac{2x - 1}{4} \sqrt{2 + x - x^2} + \frac{9}{8} \arcsin \frac{2x - 1}{3} \quad (9)$$

$$y = \frac{(1 + x) \operatorname{arctg} \sqrt{x} - \sqrt{x}}{x} \quad (10)$$

$$y = \frac{1}{2} \ln \frac{1 + \sqrt{\operatorname{tg} x}}{1 - \sqrt{\operatorname{tg} x}} - \operatorname{arctg} \sqrt{\operatorname{tg} x} \quad (11)$$

$$y = \frac{1}{\sqrt{8}} \arcsin \frac{3 + \cos x}{1 + 3 \cos x} \quad (12)$$

Задание №49

Найти производную:

$$y = \frac{2x^2 - x - 1}{3\sqrt{2 + 4x}} \quad (1)$$

$$y = \frac{(2x^2 + 3)\sqrt{x^2 - 3}}{9x^3} \quad (2)$$

$$y = 2(x - 2)\sqrt{1 + e^x} - 2 \ln \frac{\sqrt{1 + e^x} - 1}{\sqrt{1 + e^x} + 1} \quad (3)$$

$$y = \arctg e^x - e^{-x} \quad (4)$$

$$y = \ln \frac{x^2}{\sqrt{1 - ax^4}} \quad (5)$$

$$y = \log_a \frac{1}{1 - x^4} \quad (6)$$

$$y = \operatorname{ctg} \sqrt[3]{5} - \frac{1 \cos^2 4x}{8 \sin 8x} \quad (7)$$

$$y = \frac{\operatorname{tg} \ln 2 \cdot \sin^2 10x}{19 \cos 38x} \quad (8)$$

$$y = \operatorname{arctg} \frac{\sqrt{1 + x^2} - 1}{x} \quad (9)$$

$$y = \frac{2\sqrt{1 - x} \arcsin \sqrt{x}}{x} + \frac{2}{\sqrt{x}} \quad (10)$$

$$y = \frac{1}{8\sqrt{2}} \ln \frac{\sqrt{2} + \operatorname{tg} x}{\sqrt{2} - \operatorname{tg} x} - \frac{\operatorname{tg} x}{4(2 - \operatorname{tg}^2 x)} \quad (11)$$

$$y = \frac{1}{\sqrt{8}} \ln \frac{4 + \sqrt{8} \operatorname{tg} \frac{x}{2}}{4 - \sqrt{8} \operatorname{tg} \frac{x}{2}} \quad (12)$$

Задание №50

Найти производную:

$$y = \frac{(1 + x^8)\sqrt{1 + x^8}}{12x^{12}} \quad (1)$$

$$y = \frac{x - 1}{(x^2 + 5)\sqrt{x^2 + 5}} \quad (2)$$

$$y = \frac{1}{\ln 4} \ln \frac{1 + 2^x}{1 - 2^x} \quad (3)$$

$$y = x - \ln(1 + e^x) - 2e^{x/2} \operatorname{arctg} e^{x/2} - (\operatorname{arctg} e^{x/2})^2 \quad (4)$$

$$y = \ln(\sqrt{x} + \sqrt{x + 1}) \quad (5)$$

$$y = \frac{1}{\sqrt{2}} \ln(\sqrt{2} \operatorname{tg} x + \sqrt{1 + 2 \operatorname{tg}^2 x}) \quad (6)$$

$$y = \frac{\cos \sin 5 \cdot \sin^2 2x}{2 \cos 4x} \quad (7)$$

$$y = \operatorname{ctg} \cos 5 - \frac{1 \cos^2 20x}{40 \sin 40x} \quad (8)$$

$$y = \arccos \frac{x^2 - 4}{\sqrt{x^4 + 16}} \quad (9)$$

$$y = \frac{2x - 5}{4} \sqrt{5x - 4 - x^2} + \frac{9}{4} \arcsin \sqrt{\frac{x - 1}{3}} \quad (10)$$

$$y = \frac{1}{2} \operatorname{tg} x + \frac{1}{4\sqrt{2}} \ln \frac{1 + \sqrt{2} \operatorname{tg} x}{1 - \sqrt{2} \operatorname{tg} x} \quad (11)$$

$$y = \left[\frac{1}{4} \ln \left| \operatorname{tg} \frac{x}{2} \right| + \frac{1}{4} \ln \frac{3 + \cos x}{\sin x} \right] \quad (12)$$