Дифференциальное исчисление

1 – 6. Найти производную dy/dx функции $y(x)$.

7. Найти первую и вторую производные dy/dx и d^2y/dx^2.

8. Найти дифференциал функции.

9. Найти производную указанного порядка.

10. Найти уравнения касательной и нормали к кривой в точке $t = t_0$.

11. Используя правило Лопиталя, вычислить пределы.

12. а) Найти интервалы монотонности и экстремум функции.
б) На отрезке $[a,b]$ найти наибольшее и наименьшее значения функции.

13. Найти асимптоты кривой.

14. Провести полное исследование функции и построить её график.

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1. $y(x)=\frac{2(3x^3+4x^2-x-2)}{15\sqrt{1+x}}$.	2. $y(x)=x-\ln(2+e^x+2\sqrt{e^{2x}+e^x+1})$.
3. $y(x)=\sqrt{x}\cdot\ln(\sqrt{x}+\sqrt{x+a})-\sqrt{x+a}$.	4. $y(x)=\sin\sqrt{3}+\frac{1}{3}\frac{\sin^2 3x}{\cos 6x}$.
5. $y(x)=\frac{x\cdot\arcsin x}{\sqrt{1-x^2}}+\ln\sqrt{1-x^2}$.	6. $y(x)=\frac{1}{\sin\alpha}\ln(tgx+ctg\alpha)$.
7. $x(t)=\frac{3t^2+1}{3t^3}, y(t)=\sin(t+\frac{1}{3}t^3)$.	8. $y(x)=x\cdot\arcsin\left(\frac{1}{x}\right)+\ln\left(x+\sqrt{x^2-1}\right)$, $x>1$.
9. $y(x)=(5x-1)\ln^2 x$, $y'''(x)=?$	10. $x(t)=a\cdot\sin^3 t, y(t)=a\cdot\cos^3 t; t_0=\pi/3$.
11. $\lim\limits_{x\to\infty}(x-2arctgx)\ln x$; $\lim\limits_{x\to\pi/2}(\sin x)^{tgx}$; $\lim\limits_{x\to 1}\frac{x^2-x}{x^n-1}$.	
12. $y(x)=x^2+\frac{16}{x}-16$. $a=1, b=4$.	13. $y(x)=\frac{x^3-2x^2-3x+2}{1-x^2}$.
14. $y(x)=\frac{x^3+4}{x^2}$.	

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1. $y(x)=\frac{(2x^2-1)\sqrt{1+x^2}}{3x^3}$.	2. $y(x)=e^{2x}(2-\sin 2x-\cos 2x)$.
3. $y(x)=\cos\ln 2-0.5\frac{\cos^2 3x}{\sin 6x}$.	4. $y(x)=(\sin x)^{e^x}$.
5. $y(x)=4\ln\frac{x}{1+\sqrt{1-4x^2}}$.	6. $y(x)=x\cdot\cos\alpha+\sin\alpha\cdot\ln\sin(x-\alpha)$.
7. $x(t)=\sqrt{1-t^2}, y(t)=tg\sqrt{1+t}$.	8. $y(x)=\sqrt{1+2x}-\ln\left(x+\sqrt{1+2x}\right)$.
9. $y(x)=(x^2+3x+1)e^{3x+2}$, $y'''(x)=?$	10. $x(t)=a(t-\sin t), y(t)=a(1-\cos t)$, $t_0=\pi/3$.
11. $\lim\limits_{x\to\infty}\frac{x^2-1}{2x^2+1}$; $\lim\limits_{x\to\pi/2}\frac{\cos^2 x}{1-\sin x}$; $\lim\limits_{x\to 0}x\cdot\ln\left(\frac{1}{x}\right)$.	
12. $y(x)=2\sqrt{x}-x$. $a=0; b=4$.	13. $y(x)=\frac{x^2-11}{4x-3}$.
14. $y(x)=x(12-x^2)$.	

1. $y(x)=\dfrac{x^4-8x^2}{2(x^2-4)}$.	2. $y(x)=0.5\cdot arctg\dfrac{e^x-3}{2}$.
3. $y(x)=tg\lg\dfrac{1}{3}+\dfrac{1}{4}\dfrac{\sin^2 4x}{\cos 8x}$.	4. $y(x)=(\ln x)^{3x}$.
5. $y(x)=x(2x^2+5)+3\ln\left(x+\sqrt{x^2+1}\right)$.	6. $y(x)=arctg\cos\dfrac{x}{\sqrt[4]{\cos 2x}}$.
7. $x(t)=\sqrt{2t-t^2}, y(t)=\dfrac{1}{\sqrt[3]{(1-t)^2}}$.	8. $y(x)=\arccos\dfrac{1}{\sqrt{1+2x^2}}$.
9. $y(x)=\dfrac{\ln x}{x^5}$, $y'''(x)=?$	10. $x(t)=(2t+t^2)/(1+t^3), y(t)=(2t-t^2)/(1+t^3)$; $t_0=1$.
11. $\lim\limits_{x\to 0.5}\dfrac{8x^3}{6x^2-5x+1}$; $\lim\limits_{x\to 1}\dfrac{1-4\sin^2\dfrac{\pi\cdot x}{6}}{1-x}$; $\lim\limits_{x\to\infty}x^4e^{-x}$.	
12. $y(x)=\sqrt{2(x-2)^2(8-x)}-1$. $a=0, b=6$.	13. $y(x)=\dfrac{x^3+x^2-3x-1}{2x^2-2}$.
14. $y(x)=\dfrac{e^{2-x}}{2-x}$.	

1. $y(x)=\dfrac{2x^2-x-1}{3\cdot\sqrt{2+4x}}$.	2. $y(x)=\dfrac{1}{\ln 4}\cdot\ln\dfrac{1+2^x}{1-2^x}$.
3. $y(x)=ctg\sqrt[3]{5}-\dfrac{1}{8}\dfrac{\cos^2 4x}{\sin 8x}$.	4. $y(x)=(tgx)^{e^x}$.
5. $y(x)=x^3\arcsin x+x\cdot\sqrt{1-x^2}$.	6. $y(x)=\dfrac{3\sin x}{\cos^2 x}+\dfrac{2\sin x}{\cos^4 x}$.
7. $x(t)=t+\sin t, y(t)=2-\cos t$.	8. $y(x)=arctg(shx)+shx\cdot\ln chx$.
9. $y(x)=\dfrac{\ln(2x+5)}{2x+5}$, $y'''(x)=?$	10. $x(t)=\sqrt{3}\cos t, y(t)=\sin t; t_0=\pi/3$.
11. $\lim\limits_{x\to\infty}\dfrac{x^3+2x^2+8}{2x^3-3x^2-4x+3}$; $\lim\limits_{x\to 2}(2-x)tg\dfrac{\pi\cdot x}{4}$; $\lim\limits_{x\to 0}xe^{\frac{1}{x}}$.	
12. $y(x)=x-4\cdot\sqrt{x}+5$. $a=1, b=9$.	13. $y(x)=\dfrac{9-10x^2}{\sqrt{4x^2-1}}$.
14. $y(x)=2x^3+9x^2+12x$.	

1. $y(x)=\dfrac{(1+x^8)\sqrt{1+x^8}}{12x^{12}}$.	2. $y(x)=2\cdot\sqrt{e^x+1}+\ln\dfrac{\sqrt{e^x+1}-1}{\sqrt{e^x+1}+1}$.
3. $y(x)=\dfrac{\cos(\sin 5)\cdot\sin^2 2x}{2\cos 4x}$.	4. $y(x)=(x\cdot\sin x)^{\ln(x\cdot\sin x)}$.
5. $y(x)=3\arcsin\dfrac{3}{4x+1}+2\cdot\sqrt{x^2+2}$.	6. $y(x)=\dfrac{7^x\cdot(3\sin 3x+\cos 3x\cdot\ln 7)}{9+\ln^2 7}$.
7. $x(t)=\sqrt{t}, y(t)=\dfrac{1}{\sqrt{1-t}}$.	8. $y(x)=\ln\left(\cos^2 x+\sqrt{1+\cos^4 x}\right)$.
9. $y(x)=(x+7)\ln(x+4)$, $y''''(x)=?$	10. $x(t)=2t-t^2, y(t)=3t-t^3; t_0=1.$
11. $\lim\limits_{x\to a}\left(2-\dfrac{x}{a}\right)^{tg\frac{\pi\cdot x}{2a}}$; $\lim\limits_{x\to 1}\dfrac{\ln(2-x)}{1-x}$; $\lim\limits_{x\to\infty}\dfrac{x^5}{xe^x}$.	
12. $y(x)=\sqrt{2(x+1)^2(5-x)}-2$. $a=-3, b=3$.	13. $y(x)=\dfrac{-8-x^2}{\sqrt{x^2-4}}$.
14. $y(x)=\dfrac{x^2}{(x-1)^2}$.	

1. $y(x)=\dfrac{x^2}{2\cdot\sqrt{1-3x^4}}$.	2. $y(x)=\dfrac{2}{3}\sqrt{(arctge^x)^3}$.
3. $y(x)=\dfrac{\sin(\cos 3)\cdot\cos^2 2x}{4\sin 4x}$.	4. $y(x)=\left(x^3+4\right)^{tg(x)}$.
5. $y(x)=\arcsin x-\ln\left(x+\sqrt{1+x^2}\right)$.	6. $y(x)=\ln\dfrac{\sin x}{\cos x+\sqrt{\cos 2x}}$.
7. $x(t)=tgt, y(t)=\dfrac{1}{\sin 2t}$.	8. $y(x)=\dfrac{\ln x}{1+x^2}-0.5\ln\dfrac{x^2}{1+x^2}$.
9. $y(x)=(1-x-x^2)e^{\frac{x}{2}}$, $y'''(x)=?$	10. $x(t)=\arcsin\dfrac{t}{\sqrt{1+t^2}}, y(t)=\arccos\dfrac{1}{\sqrt{1+t^2}}; t_0=-1.$
11. $\lim\limits_{x\to\infty}\dfrac{e^{2x}+x}{x^2}$; $\lim\limits_{x\to 2}\dfrac{e^x-e^2}{x-2}$; $\lim\limits_{x\to\pi/2}\left(2-\dfrac{2x}{\pi}\right)^{tg(x)}$.	
12. $y(x)=3-x-\dfrac{4}{(x+2)^2}$. $a=-1, b=2.$	13. $y(x)=\dfrac{3x^2-10}{3-2x}$.
14. $y(x)=x^2(x-2)^2$.	

1. $y(x)=\dfrac{(x^2-6)\sqrt{(4+x^2)^5}}{120x^5}$.	2. $y(x)=0.5\ln(e^{2x}+1)-2arctge^x$.
3. $y(x)=\dfrac{\cos\ln 7\cdot\sin^2 7x}{7\cos 14x}$.	4. $y(x)=(x^2-1)^{shx}$.
5. $y(x)=2\arcsin\dfrac{2}{3x+4}+\sqrt{9x^2+24x}$.	6. $y(x)=\dfrac{-1}{3\sin^3 x}-\dfrac{1}{\sin x}$.
7. $x(t)=\sqrt{t}, y(t)=\sqrt[3]{1-t}$.	8. $y(x)=x\sqrt{4-x^2}+4\arcsin\dfrac{x}{2}$.
9. $y(x)=(2x^3+1)\cos x$, $y''''(x)=?$	10. $x(t)=\dfrac{3at}{1+t^2}, y(t)=\dfrac{3at^2}{1+t^2}; t_0=2.$
11. $\lim\limits_{x\to 0}\dfrac{1-\cos x}{x\ln(1-x)}$; $\lim\limits_{x\to 0}\left(tg(\dfrac{\pi}{2}-x)\right)^{ctgx}$; $\lim\limits_{x\to \pi/2}(tgx-\sec x)$.	
12. $y(x)=2(-x^2+7x-7)/(x^2-2x+2).$ $a=1,b=4.$	13. $y(x)=\dfrac{x^2-2x+2}{x+3}$.
14. $y(x)=\dfrac{x^3+4}{x^2}.$	

1. $y(x)=\dfrac{(x^2-8)\sqrt{x^2-8}}{6x^3}$.	2. $y(x)=\ln(e^x+1)+\dfrac{18e^{2x}+27e^x+11}{6(e^x+3)^3}$.
3. $y(x)=\cos tg2-\dfrac{1}{16}\dfrac{\cos^2 8x}{\sin 16x}$.	4. $y(x)=(\sin x)^{\frac{x}{2}}$.
5. $y(x)=x(2x^2+1)\sqrt{x^2+1}$.	6. $y(x)=(1+x^2)e^{arctg(x)}$.
7. $x(t)=\sqrt{t^3-1}, y(t)=\ln t$.	8. $y(x)=2x+\ln\lvert\sin x+2\cos x\rvert$.
9. $y(x)=\dfrac{\ln x}{x^3}$, $y''''(x)=?$	10. $x(t)=0.5t^2-0.25t^4, y(t)=0.5t^2+t^3/3, t_0=0.$
11. $\lim\limits_{x\to 0}\dfrac{2x^3-3x^2+tgx}{x^2+5x+\sin x}$; $\lim\limits_{x\to \pi/4}\dfrac{\sin 2x-\cos 2x-1}{\sin x-\cos x}$; $\lim\limits_{x\to 0}(1+x)^{\frac{1}{\ln x}}$.	
12. $y(x)=\sqrt[3]{2(x-2)^2(5-x)}$. $a=1,b=5$.	13. $y(x)=\dfrac{x^2+6x+9}{x+4}$.
14. $y(x)=2x^3+3x^2-5$.	

1. $y(x)=\dfrac{4+3x^3}{x\cdot\sqrt[3]{(2+x^3)^2}}$.	2. $y(x)=2\left(\sqrt{2^x-1}-arctg\sqrt{2^x-1}\right)/\ln 2$.
3. $y(x)=ctg\cos 2+\dfrac{1}{6}\cdot\dfrac{\sin^2 6x}{\cos 12x}$.	4 $y(x)=\left(\sqrt{x}\right)^{\exp\left(\frac{1}{x}\right)}$.
5. $y(x)=\ln\sqrt{1+x^2}-\dfrac{\sqrt{1+x^2}}{x}$.	6. $y(x)=\dfrac{ctgx+x}{1-x\cdot ctgx}$.
7. $x(t)=\sqrt{t-1}, y(t)=1/\sqrt{t}$.	8. $y(x)=\ln\left\|\dfrac{x+\sqrt{x^2+1}}{2x}\right\|$.
9. $y(x)=(2x+3)\ln^2 x$, $y'''(x)=?$	10. $x(t)=\sin^2 t, y(t)=\cos^2 t, t_0=\pi/6$.
11. $\lim\limits_{x\to 0}\dfrac{1-\cos x}{x\cdot\ln(1+x)}$; $\lim\limits_{x\to 3}\dfrac{\arcsin(x-3)}{\sqrt{x^2-5x+6}}$; $\lim\limits_{x\to 0}\left[\dfrac{\sin(a+mx)}{\sin(a+nx)}\right]^{\frac{1}{x}}$.	
12. $y(x)=\dfrac{-x^2}{2}+\dfrac{8}{x}+8$. $a=-4, b=-1.$	13. $y(x)=\dfrac{x^2+2x-1}{2x+1}$.
14. $y(x)=\dfrac{x^3-32}{x^2}$.	

1. $y(x)=\sqrt[3]{\dfrac{(1+\sqrt[4]{x^3})^2}{\sqrt{x^3}}}$.	2. $y(x)=2(x-2)\sqrt{1+e^x}-2\ln\left(\dfrac{\sqrt{1+e^x}-1}{\sqrt{1+e^x}+1}\right)$.
3. $y(x)=\sqrt[3]{ctg2}-\dfrac{\cos^2 10x}{20\cdot\sin 20x}$	4. $y(x)=\exp(\cos x)\cdot(x)^{\exp(\cos x)}$
5. $y(x)=\sqrt{1-3x-2x^2}+arctg\dfrac{4x+1}{17}$	6. $y(x)=\dfrac{1}{2\sin(\alpha/2)}\cdot arctg\dfrac{2x\cdot\sin(\alpha/2)}{1-x^2}$
7. $x(t)=\sqrt{t-1}, y(t)=\ln(t-1)$	8. $y(x)=arctg\dfrac{x^2-1}{x}$
9. $y(x)=x^2\cdot\sin(5x-3)$, $y''(x)=?$	10. $x(t)=(1+\ln t)/t^2, y(t)=(3+2\ln t)/t, t_0=1$
11. $\lim\limits_{x\to 0}\left(\dfrac{1}{x^2}-ctgx\right)$; $\lim\limits_{x\to\infty}\dfrac{e^{3x}+6x}{x^2}$; $\lim\limits_{x\to 0}\dfrac{(a^x-1)\ln b-(b^x-1)\ln a}{x^2}$.	
12. $y(x)=\dfrac{-2x(2x+3)}{x^2+4x+5}$. $a=-2, b=1$	13. $y(x)=\dfrac{2x^2-9}{\sqrt{x^2-1}}$
14. $y(x)=\dfrac{-\exp(-x-2)}{x+2}$	

1. $y(x)=\dfrac{x^6+x^3-2}{\sqrt{1-x^3}}$.	2. $y(x)=x+\dfrac{1}{1+e^x}-\ln(1+e^x)$.
3. $y(x)=\dfrac{1}{3}\cos tg\,\dfrac{1}{2}+0.1\dfrac{\sin^2 10x}{\cos 20x}$.	4. $y(x)=x^{\exp(\sin x)}$.
5. $y(x)=\sqrt{(4+x)(1+x)}+3\ln(\sqrt{4+x}+\sqrt{1+x})$.	6. $y(x)=arctg\dfrac{\sqrt{\sqrt{x^4+1}-x}}{x}$.
7. $x(t)=t+\sin t, y(t)=2+\cos t$.	8. $y(x)=arctg\left(tg\dfrac{x}{2}+1\right)$.
9. $y(x)=(2x^2-7)\ln(x-1)$, $y''(x)=?$	10. $x(t)=\sin^3 t, y(x)=\cos^3 t, t_0=\pi/6$.
11. $\lim\limits_{x\to 0}\dfrac{b\cdot\arcsin ax-a\cdot\arcsin bx}{x^3}$; $\lim\limits_{x\to \pi/2}\left[\dfrac{\pi}{2\cos x}-x\cdot tgx\right]$; $\lim\limits_{x\to 0}\dfrac{\ln tg(\pi/4+bx)}{ax}$.	
12. $y(x)=\sqrt[3]{2(x-1)^2(x-4)}$. $a=0, b=4$.	13. $y(x)=\dfrac{x^3-3x^2-2x+1}{1-3x^2}$.
14. $y(x)=1-\sqrt[3]{x^2-2x}$.	

1. $y(x)=\dfrac{(x^2-2)\sqrt{4+x^2}}{24x^3}$.	2. $y(x)=x-3\ln\left[(1+e^{\frac{x}{6}})\sqrt{1+e^{\frac{x}{3}}}\right]-arctge^{\frac{x}{6}}$.
3. $y(x)=\ln\sin\dfrac{1}{6}-\dfrac{1}{24}\dfrac{\cos^2 12x}{\sin 24x}$.	4 $y(x)=x^{arctgx}$.
5. $y(x)=\ln\dfrac{\sqrt{x^2-x+1}}{x}+arctg\dfrac{2x-1}{\sqrt{3}}$.	6. $y(x)=(\sin 4x\cdot\ln 6-4\cos 4x)\cdot 6^x$.
7. $x(t)=\ln\dfrac{t}{\sqrt{1-t^2}}, y(t)=\arcsin\sqrt{1-t^2}$.	8. $y(x)=\ln\lvert\cos\sqrt{x}\rvert+\sqrt{x}\cdot tg\sqrt{x}$.
9. $y(x)=x\cdot\cos x^2$, $y''(x)=?$	10. $x(t)=\dfrac{t+1}{t}, y(t)=\dfrac{t-1}{t}, t_0=-1$.
11. $\lim\limits_{x\to \pi/4}\dfrac{tgx-ctgx}{ctg2x}$; $\lim\limits_{x\to 0}\left[e^x-x-0.5x^2\right]$; $\lim\limits_{x\to a}\ln\dfrac{a+x}{2a}\cdot tg\dfrac{\pi\cdot x}{2a}$.	
12. $y(x)=x^2-2x+\dfrac{16}{x-1}-13$. $a=2, b=5$.	13. $y(x)=\dfrac{21-x^2}{7x+9}$.
14. $y(x)=\sqrt[3]{x(x+3)^2}$.	

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1. $y(x)=\dfrac{1+x^2}{2\sqrt{1+2x^2}}$.	2. $y(x)=x+\dfrac{8}{1+e^{\frac{x}{4}}}$.
3. $y(x)=8\sin ctg3+\dfrac{1}{5}\dfrac{\sin^2 5x}{\cos 10x}$.	4. $y(x)=x^{29^x}\cdot 29^x$.
5. $y(x)=\dfrac{\arcsin x}{\sqrt{1-x^2}}+0.5\ln\dfrac{1-x}{1+x}$.	6. $y(x)=arctg\dfrac{\sqrt{2tgx}}{1-tgx}$.
7. $x(t)=(\arccos t)^2, y(t)=(1+\cos^2 t)^2$.	8. $y(x)=x(\sin\ln x-\cos\ln x)$.
9. $y(x)=\dfrac{\ln x}{x^2}$, $y'''(x)=?$	10. $x(t)=\ln(1+t^2), y(t)=t-arctgt, t_0=1$.
11. $\lim\limits_{x\to 1}\left[\dfrac{1}{\ln x}-\dfrac{4}{x^4-1}\right]$; $\lim\limits_{x\to\infty}\left[x-x^2\ln\left(1+\dfrac{1}{x}\right)\right]$; $\lim\limits_{x\to 0}(\ln ctgx)^{tgx}$.	
12. $y(x)=2\sqrt{x-1}-x+2$. $a=1, b=5$.	13. $y(x)=\dfrac{x^2+16}{\sqrt{9x^2-16}}$.
14. $y(x)=\dfrac{x^3-27x+54}{x^3}$.	

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1. $y(x)=\dfrac{(3x+2)\sqrt{x-1}}{4x^2}$.	2. $y(x)=\ln\left(e^x+\sqrt{e^{2x}-1}\right)+arctge^x$.
3. $y(x)=\dfrac{\cos ctg3\cdot\cos^2 12x}{28\sin 28x}$.	4. $y(x)=x^9\cdot x^{\exp(x)}$.
5. $y(x)=x\cdot\arcsin\sqrt{\dfrac{x}{x+1}}-\sqrt{x}$.	6. $y(x)=arctg\dfrac{2\sin x}{\sqrt{9\cos^2 x-4}}$.
7. $x(t)=\dfrac{1}{t}, y(t)=\dfrac{1}{1+t^2}$.	8. $y(x)=\cos x\cdot\ln tgx-\ln tg\dfrac{x}{2}$.
9. $y(x)=(\cos 2x-3\cos 3x)\cdot e^{-x}$, $y'''(x)=?$	10. $x(t)=\dfrac{1+t^3}{t^2-1}, y(t)=\dfrac{t}{t^2-1}, t_0=2.$
11. $\lim\limits_{x\to 0}\dfrac{tgx-x}{x-\sin x}$; $\lim\limits_{x\to 1}\left(\dfrac{1}{\ln x}-\dfrac{x}{\ln x}\right)$; $\lim\limits_{x\to a}\left[3-\dfrac{2x}{a}\right]^{2tg\frac{\pi\cdot x}{2a}}$.	
12. $y(x)=\dfrac{-x^2}{2}+2x+\dfrac{8}{x-2}+5$. $a=-2, b=1$.	13. $y(x)=\dfrac{4x^3-3x}{4x^2-1}$.
14. $y(x)=\ln\dfrac{x}{x-2}-2$.	

1. $y(x)=\dfrac{\sqrt{(1+x^2)^3}}{3x^3}$.	2. $y(x)=x-e^{-x}\cdot\arcsin e^x-\ln\left(1+\sqrt{1-e^{2x}}\right)$.
3. $y(x)-\dfrac{\cos tg\dfrac{1}{3}\cdot\sin^2 15x}{15\cos 30x}$.	4. $y(x)=(\arcsin x)^{\exp(x)}$.
5. $y(x)=\arcsin\dfrac{1}{2x+3}+2\sqrt{x^2+3x}$.	6. $y(x)=(\cos x+2^x\sin 2x)\cdot 5^x$.
7. $x(t)=\dfrac{1}{t}, y(t)=\dfrac{t}{1+t^2}$.	8. $y(x)=\sqrt{x}-(1+x)arctg\sqrt{x}$.
9. $y(x)=(5x-8)\cdot 2^{-x}$, $y'''(x)=?$	10. $x(t)=t-t^4, y(t)=t^2-t^3, t_0=1.$
11. $\lim\limits_{x\to 1}\dfrac{1-8\sin^3\dfrac{\pi\cdot x}{6}}{1-x^3}$; $\lim\limits_{x\to-\infty}(\pi+2arctgx)\cdot\ln\lvert x\rvert$; $\lim\limits_{x\to 0}(\cos mx)^{\frac{n}{x^2}}$.	
12. $y(x)=8x+\dfrac{4}{x^2}-15$. $a=0.5; b=2$.	13. $y(x)=\dfrac{x^2-6x+4}{3x-2}$.
14. $y(x)=3\cdot\sqrt[3]{(x-2)^2}-2x+6.$	

1. $y(x)=\dfrac{x^6+8x^3-128}{\sqrt{8-x^3}}$.	2. $y(x)=x-\ln(1+e^x)-2e^{\frac{-x}{2}}arctge^{\frac{x}{2}}$.
3. $y(x)=\dfrac{\sin tg7\cdot\cos^2 16x}{32\sin 32x}$.	4. $y(x)=x^{\arcsin x}$.
5. $y(x)=6\arcsin\dfrac{x}{2}+\dfrac{x}{4}\sqrt{4-x^2}$.	6. $y(x)=\ln\dfrac{\sqrt{2}+thx}{\sqrt{2}-thx}$.
7. $x(t)=t\sqrt{t^2+1}, y(t)=\ln\dfrac{1+\sqrt{1+t^2}}{t}$.	8. $y(x)=x\sqrt{x^2+1}+\ln\left\lvert x+\sqrt{x^2-1}\right\rvert$.
9. $y(x)=x\cdot\ln(1-3x)$, $y''''(x)=?$	10. $x(t)=2\cos t, y(t)=\sin t, t_0=-\pi/3.$
11. $\lim\limits_{x\to 0}\left(\dfrac{1}{x}\right)^{tgx}$; $\lim\limits_{x\to 1}\dfrac{a^{\ln x}-x}{\ln x}$; $\lim\limits_{x\to a}\arcsin\dfrac{x-a}{a}\cdot ctg(x-a)$.	
12. $y(x)=\sqrt[3]{2(x+2)^2(x-4)}+3$. $a=-4, b=2.$	13. $y(x)=\dfrac{2x^3+2x^2-3x-1}{2-4x^2}$.
14. $y(x)=4x+8-6\sqrt[3]{(x+2)^2}$.	

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1. $y(x)=(1-x^2)\sqrt[5]{x^3+1/x}$.	2. $y(x)=\frac{1}{m\sqrt{ab}}arctg\left(\sqrt{\frac{a}{b}}\cdot e^{mx}\right)$.
3. $y(x)=\frac{\sqrt[5]{ctg2}\cdot\cos^2 16x}{32\sin 36x}$.	4. $y(x)=(\cos 5x)^{\exp(x)}$
5. $y(x)=x^3\arccos x+(x^2+2)\sqrt{1-x^2}$.	6. $y(x)=\frac{\cos x}{\sin^2 x}-2\cos x+\ln tgx.$
7. $x(t)=\ln tgt, y(t)=\frac{1}{\sin^2 t}$.	8. $y(x)=x^2 arctg\sqrt{x^2-1}-\sqrt{x^2-1}$.
9. $y(x)=(3x-7)\cdot 3^{-x}$, $y''''(x)=?$	10. $x(t)=\sin t, y(t)=\cos 2t, t_0=\pi/6.$
11. $\lim\limits_{x\to 0}\frac{e^{ax}-e^{-ax}}{\ln(1+x)}$; $\lim\limits_{x\to 0}\left(\frac{1}{x}\right)^{\sin x}$; $\lim\limits_{x\to 1}\left(\frac{1}{\ln x}-\frac{1}{x-1}\right)$.	
12. $y(x)=\frac{4}{x^2}-8x-15$. $a=-2, b=-0.5.$	13. $y(x)=\frac{4x^2+9}{4x+8}$
14. $y(x)=-(2x+3)\cdot\exp(2x+4)$	

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1. $y(x)=\frac{(x-2)\sqrt{2x+3}}{x^2}$.	2. $y(x)=\frac{\exp(x^3)}{1+x^3}$.
3. $y(x)=\frac{ctg\sin 3\cdot\sin^2 17x}{17\cos 34x}$.	4. $y(x)=x^{tgx}$.
5. $y(x)=\frac{\sqrt{x^2+2}}{x^2}-\ln\frac{\sqrt{2}+\sqrt{x^2+2}}{x}$.	6. $y(x)=3^x\cdot(4\sin 4x+\cos 4x).$
7. $x(t)=\ln(1-t^2), y(t)=\arcsin\sqrt{1-t^2}$.	8. $y(x)=tg\left(2\arccos\sqrt{1-2x^2}\right)$.
9. $y(x)=e^{\frac{x}{2}}\cdot\sin 2x$, $y''''(x)=?$	10. $x(t)=t^3+1, y(t)=t^2, t_0=-2.$
11. $\lim\limits_{x\to 2}\frac{\ln(x^2-3)}{x^2+3x-10}$; $\lim\limits_{x\to\infty}\left(a^{\frac{1}{x}}-1\right)\cdot x$; $\lim\limits_{x\to 0}x^{\frac{1}{\ln(e^x-1)}}$.	
12. $y(x)=x^2+4x+\frac{16}{x+2}-9$. $a=-1, b=2$.	13. $y(x)=\frac{x^2-3}{\sqrt{3x^2-2}}$.
14. $y(x)=\frac{4x^2}{3+x^2}$.	

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1. $y(x)=\dfrac{6+2\sqrt[3]{x^2}-3x}{4-5x\sqrt{x}+x^3}$.	2. $y(x)=\dfrac{tgx-ctgx}{\cos^3 x}-\sin x^2$.
3. $y(x)=2\lg(x+2)-\sin\ln x+\arccos\dfrac{x}{3}$.	4. $y(x)=x\cdot 3^{x^2}-(x+1)^{\sqrt{x}}+4x^3$.
5. $y(x)=x\sqrt{x}+3\sqrt[3]{x^2}-5\sqrt[4]{x}$.	6. $y^3x^2+\sin x-2xy+\ln(x+1)=0$.
7. $x(t)=\sin t^2, y(t)=1+2t^3.$	8. $y(x)=2\sin\cos(x-2)+tgx^2\cdot\sqrt[3]{x^3+4x-5}$.
9. $y(x)=\dfrac{tgx}{x+1}.$ $y'''(x)=?$	10. $x(t)=-\cos t+t\cdot\sin t, y(t)=\sin t-t\cdot\cos t, t_0=\pi/2.$
11. $\lim\limits_{x\to\infty} x^2\cdot\left(1-e^{\frac{1}{x}}\right)$; $\lim\limits_{x\to\infty}\left(1-\dfrac{2}{x^2}\right)^x$; $\lim\limits_{x\to 0}\left(\dfrac{1}{x}\right)^{\sin 2x}$.	
12. $y(x)=-\dfrac{2}{3}\ln x-\dfrac{1}{6}x^2+x$. $a=0.5; b=3.$	13. $y(x)\cdot(x^2-3bx+2b^2)=x^3-3ax^2+a^3.$
14. $y(x)=\dfrac{x^3+2x^2+7x-3}{2x^2}$.	

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1. $y(x)=\sqrt{x^3+2x^2+2}+\dfrac{(x-3)^2}{\sqrt[3]{x^3+1}}$.	2. $y(x)=\ln\dfrac{x^2+1}{x^3+3x^2+7}-arctg\dfrac{\sin x}{x+1}$.
3. $y(x)=x^4+\sin\cos x+e^x\ln tgx$.	4. $y(x)=(x^2+2x-1)^{1-\sin x}$.
5. $y(x)=3^{x+1}-\sin^2 e^x+\ln(e^x\cos x)+4\sqrt[12]{15}$.	6. $xy^2-2xy+3x^2y-2x+4y+5=0.$
7. $x(t)=\ln\sin t^2, y(t)=\cos t^2.$	8. $y(x)=arctg(x-2)^2+(x^3-\ln x)\cos^2 x.$
9. $y(x)=tgx-ctgx.$ $y''''(x)=?$	10. $x(t)=3t, y(t)=t^2-6, t_0=1.$
11. $\lim\limits_{x\to 0}\dfrac{e^{\sin x}-e^x}{\ln(e^x-1)}$; $\lim\limits_{x\to+\infty}(x^n\cdot e^{-x})$; $\lim\limits_{x\to 0}\dfrac{\ln\cos 2x}{x-\sin x}$.	
12. $y(x)=x^2e^{-x}$. $a=-1, b=4.$	13. $y^3(x)=a^3-x^3$.
14. $y(x)=\dfrac{x^4}{x^3-1}$.	

1. $y(x)=\frac{(2x+1)\sqrt{x^2-x}}{x^2}$.	2. $y(x)=\frac{e^x}{2}\cdot\left[(x^2-1)\cos x+(x-1)^2\sin x\right]$.
3. $y(x)=\sqrt{tg4x}+\frac{\sin^2 21x}{21\cos 42x}$.	4. $y(x)=(x^4+5)^{ctg(x)}$.
5. $y(x)=3\arcsin\frac{3}{x+2}+\sqrt{x^2+4x-5}$.	6. $y(x)=\frac{\ln(ctgx+ctg\alpha)}{\sin\alpha}$.
7. $x(t)=\sin t, y(t)=\ln\cos t.$	8. $y(x)=\ln(x+\sqrt{1+x^2})-\sqrt{1+x^2}\,arctgx$.
9. $y(x)=\frac{\ln(3+x)}{3+x}$, $y'''(x)=?$	10. $x(t)=t\cdot\cos t, y(t)=t\cdot\sin t, t_0=\pi/2$.
11. $\lim\limits_{x\to 0}\frac{\ln(1+x^2)}{\cos 3x-e^{-x}}$; $\lim\limits_{x\to 0}x^n\cdot\ln x$; $\lim\limits_{x\to 0}x^x$.	
12. $y(x)=\frac{10x+10}{x^2+2x+2}$. $a=-1,b=2.$	13. $y(x)=\frac{x^3+3x^2-2x-2}{2-3x^2}$.
14. $y(x)=\frac{x^2-x+1}{x-1}$.	

1. $y(x)=2\sqrt{\frac{1-\sqrt{x}}{1+\sqrt{x}}}$.	2. $y(x)=arctg(e^x-e^{-x})$.
3. $y(x)=\cos\ln 3-\frac{1}{44}\frac{\cos^2 22x}{\sin 44x}$.	4. $y(x)=(x^2+1)^{\cos x}$.
5. $y(x)=arctg\sqrt{x^2-1}-\frac{\ln x}{\sqrt{x^2-1}}$.	6. $y(x)=\frac{2^x(\sin x+\cos x\cdot\ln 2)}{1+(\ln 2)^2}$.
7. $x(t)=\ln\sqrt{\frac{1-t}{1+t}}, y(t)=\sqrt{1-t^2}$.	8. $y(x)=\ln(e^x+\sqrt{e^{2x}-1})+\arcsin e^{-x}.$
9. $y(x)=(4x+3)e^{-x}$, $y''''(x)=?$	10. $x(t)=\arcsin\frac{t}{\sqrt{1+t^2}}, y(t)=\arccos\frac{1}{\sqrt{1+t^2}}, t_0=1$
11. $\lim\limits_{x\to 1}\frac{x^2-1+\ln x}{e^x-e}$; $\lim\limits_{x\to 0}x^2\cdot\ln x$; $\lim\limits_{x\to 0}(\sin x)^x$.	
12 . $y(x)=4-x-\frac{4}{x^2}; a=1,b=4.$	13. $y(x)=\frac{3x^2-7}{2x+1}$.
14. $y(x)=\ln\frac{x+6}{x}-1$.	

1. $y(x)=\dfrac{1}{(x+2)\sqrt{x^2+4x+4}}$.	2. $y(x)=3\cdot\exp(\sqrt[3]{x})\cdot\left[\sqrt[3]{x^5}-5\sqrt[3]{x^4}\,20x-120\right]$.
3. $y(x)=\ln\cos 1+\dfrac{\sin^2 23x}{23\cos 46x}$.	4. $y(x)=x^{3^x}$.
5. $y(x)=x\cdot\ln\left[\sqrt{1-x}+\sqrt{1+x}\right]+0.5(\arcsin x-x)$.	6. $y(x)=\dfrac{\ln(arctgx+ctg\alpha)}{\sin(\alpha+1)}$.
7. $x(t)=\sqrt{1-t^2}, y(t)=\dfrac{t}{\sqrt{1-t^2}}$.	8. $y(x)=\ln tg\dfrac{x}{2}-\dfrac{x}{\sin x}$.
9. $y(x)=(1+x^2)arctgx; y'''(x)=?$	10. $x(t)=\dfrac{1+t^2}{t^2}, y(t)=\dfrac{3}{2t^2}+\dfrac{2}{t}; t_0=2.$
11. $\lim\limits_{x\to 0}\dfrac{x-\sin x}{x^3}$; $\lim\limits_{x\to 0}\left(\dfrac{1}{x}-\dfrac{1}{e^x-1}\right)$; $\lim\limits_{x\to \pi/2}(tgx)^{2\cos x}$.	
12. $y(x)=\dfrac{2-x^2}{\sqrt{9x^2-4}}; a=-3, b=3.$	13. $y(x)=\dfrac{2-x^2}{\sqrt{9x^2-4}}$.
14. $y(x)=2x+6-3\sqrt[3]{9x+3)^2}$.	

1. $y(x)=3\dfrac{\sqrt[3]{x^2+x+1}}{x+1}$.	2. $y(x)=-\dfrac{e^{3x}}{3\cdot sh^3 x}$.
3. $y(x)=\sqrt[3]{\cos\sqrt{2}}-\dfrac{1}{52}\dfrac{\cos^2 26x}{\sin 52x}$.	4. $y(x)=x^{ctg(x^2)}$.
5. $y(x)=\ln\sqrt[3]{\dfrac{x-1}{x+1}}+x\cdot arctgx$.	6. $y(x)=2\dfrac{\cos x}{\sin^4 x}+\dfrac{3\cos x}{\sin^2 x}$.
7. $x(t)=e^t, y(t)=\arcsin t.$	8. $y(x)=\sqrt{ctgx}-\dfrac{1}{3}\sqrt{tg^3 x}.$
9. $y(x)=\dfrac{\ln x}{x^2}; y'''(x)=?$	10. $x(t)=t\cdot\sin t+\cos t, y(t)=\sin t-t\cdot\cos t; t_0=\pi/2$.
11. $\lim\limits_{x\to\infty}\dfrac{xe^{\frac{x}{2}}}{x+e^x}$; $\lim\limits_{x\to 0}\arcsin x\cdot ctgx$; $\lim\limits_{x\to \pi/2}(\pi-2x)^{\cos x}$.	
12. $y(x)=\dfrac{10x}{1+x^2}; a=0, b=3.$	13. $y(x)=\dfrac{2x^2-6}{x-2}$.
14. $y(x)=1-\sqrt[3]{x^2+4x+3}.$	

1. $y(x)=3\cdot\sqrt[3]{(x+1)(x-1)^2}$.	2. $y(x)=\arcsin e^x-\sqrt{1-e^{2x}}$.
3. $y(x)=\sin\sqrt[3]{tg2}-\dfrac{\cos^2 28x}{56\sin 56x}$.	4. $y(x)=(tgx)^{\ln tgx}$.
5. $y(x)=\sqrt{x^2+1}-0.5\ln(\sqrt{x^2-1}-x)$.	6. $y(x)=\dfrac{\cos x}{2+\sin x}+arctg\dfrac{tgx}{2}$.
7. $x(t)-\ln\dfrac{1-t}{1+t}, y(t)=\sqrt{1-t^2}$.	8. $y(x)=\sqrt[3]{\dfrac{x+2}{x-2}}$.
9. $y(x)=(4x^3+5)e^{2x+1}, y''''(x)=?$	10. $x(t)=1-t^2, y(t)=t-t^3, t_0=2.$
11. $\lim\limits_{x\to a}\dfrac{\ln(x-a)}{\ln(e^x-e^a)}$; $\lim\limits_{x\to 0}(1-\cos x)ctgx$; $\lim\limits_{x\to 0}(\cos 2x)^{\frac{3}{x^2}}$.	
12. . $y(x)=2x^2+\dfrac{108}{x}-59; a=2, b=4.$	13. $y(x)=\dfrac{4x^3+3x^2-8x-2}{2-3x^2}$.
14. $y(x)=\dfrac{(x-1)^2}{(x+1)^2}$.	

1. $y(x)=\dfrac{x+7}{6\cdot\sqrt{x^2+2x-7}}$.	2. $y(x)=-0.5(x^4+2x^2+2)e^{-x^2}$.
3. $y(x)=\sin^3\cos 2-\dfrac{\cos^2 30x}{60\sin 60x}$.	4. $y(x)=\left(1+x^8\right)^{tgx}$.
5. $y(x)=\dfrac{1}{3}(x-2)\sqrt{x+1}+\ln(\sqrt{x+1}+1)$.	6. $y(x)=\dfrac{\ln 3^x\cdot\sin 2x-2\cos x}{\ln^2 3+4}$.
7. $x(t)=c0st+t\sin t, y(t)=\sin t-t\sin t.$	8. $y(x)=\ln\lvert x^2-1\rvert-\dfrac{1}{x^2-1}.$
9. $y(x)=\dfrac{\ln\lvert x-1\rvert}{\sqrt{x-1}}; y'''(x)=?$	10. $x(t)=t(1-\sin t), y(t)=t\cos t; t_0=0.$
11. $\lim\limits_{x\to\infty}\dfrac{\ln x}{x^n}$; $\lim\limits_{x\to 1}\left[\dfrac{p}{1-x^p}-\dfrac{q}{1-x^q}\right]$; $\lim\limits_{x\to\infty}\left(1+\dfrac{3}{x}\right)^x$.	
12. $y(x)=x-4\sqrt{x+2}+8; a=-1, b=7.$	13. $y(x)=\dfrac{x^3-4x}{3x^2-4}$.
14. $y(x)=\sqrt[3]{x^2+4x+3}$.	

1. $y(x)=\dfrac{x\sqrt{x+1}}{x^2+x+1}$.	2. $y(x)=\dfrac{\exp(x^2)}{1+x^2}$.
3. $y(x)=\cos^2\sin 3+\dfrac{\sin^2 29x}{29\cos 58x}$.	4. $y(x)=(\cos 2x)^{\ln\cos x}$.
5. $y(x)=(2+3x)\sqrt{x-1}+arctg(x-1).$	6. $y(x)=0.5\ln\dfrac{1+\cos x}{1-\cos x}-\dfrac{1}{\cos x}-\dfrac{1}{3\cos^3 x}$.
7. $x(t)=\cos t+\sin t,\ y(t)=\sin 2t.$	8. $y(x)=\ln\left\|2x+2\sqrt{x^2+x}+1\right\|$.
9. $y(x)=(3-x^2)\ln^2 x;\ y'''(x)=?$	10. $x(t)=3\cos t,\ y(t)=4\sin t;\ t_0=\pi/4.$
11. $\lim\limits_{x\to 0}\left[\dfrac{tgx}{x}\right]^{\frac{1}{x^2}}$; $\lim\limits_{x\to 0}(1-e^{2x})\cdot ctgx$; $\lim\limits_{x\to 1}\dfrac{tg\dfrac{\pi\cdot x}{2}}{\ln(1-x)}$.	
12. $y(x)=-\dfrac{2(x^2+3)}{x^2+2x+5};\ a=-5,b=1.$	13. $y(x)=\dfrac{17-x^2}{4x-5}$.
14. $y(x)=-\dfrac{3\cdot\sqrt[3]{6(x+2)^2}}{x^2+8x+24}$.	

1. $y(x)=\dfrac{x^4+2x^2-3x}{12\cdot\sqrt[3]{x-1}}$.	2. $y(x)=x^2+\ln(3+2^x+3\cdot\sqrt{tgx+1}).$
3. $y(x)=\sqrt{x}\cdot\ln(\sqrt[3]{x}+\sqrt{x+2}).$	4. $y(x)=\sin 2+0.5\dfrac{\cos^2 3x}{\sin 2x}$.
5. $y(x)=\dfrac{x^2\cdot arctgx}{1+x^2}+\ln\sqrt[3]{1-x}$.	6. $y(x)=arctg\sqrt{\dfrac{x^2+1}{x^3-1}}$.
7. $x(t)=\cos^2 t,\ y(t)=\arcsin t.$	8. $y(x)=x^2\cdot tg\dfrac{1+x}{2}+\ln tg\dfrac{x}{2}.$
9. $y(x)=(5x^2+1)\sin^2 x;\ y'''(x)=?$	10. $x(t)=\sin^2 t,\ y(t)=2\cos^2 t;\ t_0=\pi/3.$
11. $\lim\limits_{x\to\pi/4}(tgx)^{\frac{1}{tg2x}}$; $\lim\limits_{x\to\infty}(x^2-1)\ln x$; $\lim\limits_{x\to 1}\dfrac{x^3-2x^2+x}{\sqrt{x-1}}$.	
12. $y(x)=x-4\sqrt{x}+6;\ a=1,b=4.$	13. $y(x)=\dfrac{\exp(2-x)}{2-x}$.
14. $y(x)=\dfrac{21-x^2}{7x+9}$.	

1. $y(x)=\frac{(2x-1)\sqrt{x^2-1}}{2x^4}$.	2. $y(x)=(1+\sin x+\cos 3x)\cdot 2^{3x}$.
3. $y(x)=tg3-0.5\frac{\cos 4x}{\sin 5x}$.	4. $y(x)=(tgx)^{2^x}$.
5. $y(x)=\ln\left(1+\cos 2x+\sqrt{x}\right)$.	6. $y(x)=x^{\ln 2}+\cos\ln(x+1)^2+x$.
7. $x(t)=e^{2t}\cos t, y(x)=e^{3t}\sin t.$	8. $y(x)=\sqrt{3x+1}+\ln(x+2\sqrt{1+x})$.
9. $y(x)=(x^2+5x)e^{3x}; y'''(x)=?$	10. $x(t)=a\cdot(t+\sin t), y(t)=a\cdot\cos t; t_0=\pi/4.$
11. $\lim\limits_{x\to\infty}\frac{x^2+x+1}{3x+5}$; $\lim\limits_{x\to\pi/4}\frac{1-2\cos^2 x}{\pi^2-16x^2}$; $\lim\limits_{x\to 0}x^2\cdot\ln\frac{1}{x}$.	
12. $y(x)=2\sqrt{x-1}-x+2$. $a=1,b=4.$	13. $y(x)=\ln\frac{x}{x-2}-2.$
14. $y(x)=\frac{x^3-4}{x^2}.$	

1. $y(x)=\frac{x^4+3x}{4(x^2-5)}$.	2. $y(x)=2arctg(e^x+2)$.
3. $y(x)=\ln tg(0.5)-0.25\frac{\cos^2 3x}{c0s4x}$.	4. $y(x)=(3x)^{\ln x}$.
5. $y(x)=x^2(x^2+3x-1)+3\ln(x+5\cdot\sqrt[3]{x-3}).$	6. $y(x)=arctg\sin\frac{x}{\sqrt{x+2}}$.
7. $x(t)=t+2\sqrt{t}, y(t)=t^3-1.$	8. $y(x)=\ln\cos\frac{1}{\sqrt{x^2-1}}$.
9. $y(x)=\frac{\ln(x+1)}{x-1}; y'''(x)=?$	10. $x(t)=\frac{2t}{1+t^2}, y(t)=\frac{t-1}{1+t^2}; t_0=3.$
11. $\lim\limits_{x\to\infty}\frac{x^3-1}{6x^3-5x+1}$; $\lim\limits_{x\to\infty}x^3\cdot\exp(-x)$; $\lim\limits_{x\to 1}\frac{1-4\sin^2\frac{\pi\cdot x}{6}}{1-x^3}$.	
12. $y(x)=-\frac{x^2}{2}+2x+\frac{8}{x-2}+5; a=-2,b=0.$	13. $y(x)=\frac{3x-2}{x^3}$.
14. $y(x)=\frac{1}{x^4-1}$.	

1. $y(x)=\frac{2\cdot\sqrt{x^2-1}}{x^2+x-1}$.	2. $y(x)=\cos 2\cdot\ln\frac{1+3x}{1+3^x}$.
3. $y(x)=arctg\ln e^4-0.5\frac{\sin 2x}{\cos^2 x}$.	4. $y(x)=(x)^{tgx}$.
5. $y(x)=x^2\cdot\ln tgx-\sqrt{\frac{x^2-1}{\ln x}}$.	6. $y(x)=2\arccos\sqrt{2x-1}+\ln 2\sqrt{x^3-1}+3$.
7. $x(t)=t-2\sin t, y(t)=2-\cos t.$	8. $y(x)=arctg2x+3\cdot sh\frac{x}{2}\cdot\ln chx.$
9. $y(x)=\frac{\ln 2x+1}{3x^2+5}; y'''(x)=?$	10. $x(t)=3\cos t, y(t)=2\sin t; t_0=\pi/4.$
11. $\lim\limits_{x\to\infty}\frac{x^8+4x^3-7x+2}{3x^3-x^2+4x+1}$; $\lim\limits_{x\to 1}(x-1)e^{\frac{1}{x-1}}$; $\lim\limits_{x\to 1}(1-x)tg\frac{\pi\cdot x}{2}$.	
12. $y(x)=\frac{4}{x^2-4x+5}; a=-2, b=-1.$	13. $y(x)=\frac{4x^3-3x}{x^2-1}$.
14. $y(x)=-(x+1)\exp(x+2).$	

1. $y(x)=\frac{(1+x^2)\sqrt{1+x^7}}{x^5}$.	2. $y(x)=3\cdot\sqrt{2^x-1}+\ln\frac{\sqrt{2^x-2}}{e^x}$.
3. $y(x)=\frac{tg\cos 2\cdot\sin^3 3x}{1-\cos 4x}$.	4. $y(x)=(x\cdot\cos x)^{\ln(x+1)}$.
5. $y(x)=2\cdot arctg\frac{3}{x}-2\cdot\sqrt{x^2+5}$.	6. $y(x)=\frac{(\sin x+\cos 2x\cdot\ln 2)\cdot\exp(x)}{1+\ln^3 2}$.
7. $x(t)=\sqrt{t+1}, y(t)=\frac{1}{\sqrt{t-1}}$.	8. $y(x)=\ln(\ln^2 x+\sqrt{1-x^2}).$
9. $y(x)=(x+1)\ln(x^2+4); y'''(x)=?$	10. $x(t)=2t+t^3, y(t)=t^2-1; t_0=2.$
11. $\lim\limits_{x\to -3}\left[2+\frac{x}{3}\right]^{tg\frac{\pi\cdot x}{6}}$; $\lim\limits_{x\to -1}\frac{\ln(2+x)}{x+1}$; $\lim\limits_{x\to\infty}x^3\cdot e^{-x}$.	
12. $y(x)=\frac{10x+10}{x^2+2x+2}; a=-2, b=2.$	13. $y(x)=\frac{2x^2-1}{\sqrt{x^2-2}}$.
14. $y(x)=\frac{\exp(x-3)}{x-3}$.	

1. $y(x)=\dfrac{x^3}{3\cdot\sqrt{1-2x^3}}$.	2. $y(x)=x\cdot\sqrt{\arccos e^x+x^3}$.
3. $y(x)=\dfrac{\ln ctg5-sh^2 3x}{2\cdot chx}$.	4. $y(x)=(th2x)^{\ln x}$.
5. $y(x)=\arccos x-\ln(2x+\ln tg\sqrt{x})$.	6. $y(x)=tg\dfrac{\ln\sin x}{\cos x+2\sqrt{\sin x}}$.
7. $x(t)=\sqrt[3]{1+t^3}, y(t)=\cos(1+t).$	8. $y(x)=\dfrac{\ln(1+x)}{1+x^2}-\dfrac{1}{3}\ln tg\dfrac{x}{2}.$
9. $y(x)=(x^2+1)\exp(2x); y'''(x)=?$	10. $x(t)=\arccos\dfrac{t}{\sqrt{1+t}}, y(t)=\arcsin\dfrac{t-1}{\sqrt{1+t^2}}; t_0=1.$
11. $\lim\limits_{x\to\infty}\dfrac{2^x+x}{x^3}$; $\lim\limits_{x\to 2}\dfrac{\ln 2x-2\ln 2}{x^2-4}$; $\lim\left[1+\dfrac{2x}{3}\right]^{\frac{1}{tgx}}$.	
12. $y(x)=\sqrt[3]{2(x-2)^2(5-x)}; a=1, b=5.$	13. $y(x)=\dfrac{x^2-3}{\sqrt{3x^2-2}}$.
14. $y(x)=\ln\dfrac{x+6}{x}-1.$	

1. $y(x)=\dfrac{5x^3-x^2+x-1}{2\cdot\sqrt[3]{x-1}}$.	2. $y(x)=\sqrt{x}+2\ln(x+e^x-\sqrt{x-e^x})$..
3. $y(x)=\ln(\sqrt{x-2}-\sqrt{x+2})+\dfrac{1}{x^3}$.	4. $y(x)=tg4+0.5\dfrac{\sin^3 3x}{\sin^5 2x}$.
5. $y(x)=x\cdot arctg\sqrt{x}-\ln(\sqrt{1-ch^2 x}+1).$	6. $y(x)=\dfrac{1}{2tg3\alpha}\arccos(\sqrt{x}+tgx).$
7. $x(t)=\cos 2t, y(t)=0.5\sec^3 t.$	8. $y(x)=x\cdot\arcsin x+\ln(x-\sqrt{1-x^2})$.
9. $y(x)=3x^3\cdot\exp(2x+5); y''''(x)=?$	10. $x(t)=\dfrac{3t+1}{t^2}, y(t)=\cos 2t; t_0=\pi/3.$
11. $\lim\limits_{x\to\infty}(1-x^2)\ln(1+x)$; $\lim\limits_{x\to 0}(tgx)^{ctgx}$; $\lim\limits_{x\to 1}\dfrac{x^\alpha-x}{x^2-1}$.	
12. $y(x)=x+\dfrac{4}{x}+5; a=2, b=6.$	13. $y(x)=\dfrac{x^4+2x^2-x}{x^3-1}$.
14. $y(x)=-\dfrac{1}{16}(x+1)^2(x-3)^2.$	

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1. $y(x)=\frac{1-x^3}{1-x^5}+\frac{1}{1+\sqrt{x}}-\frac{1}{1-\sqrt{x}}+\sqrt{\frac{1-\cos 4x}{1+\cos 4x}}.$	2. $y(x)=tg2+tg2x+\frac{2}{3}tg^3 2x-\frac{1}{5}tg^5 2x^2.$
3. $y(x)=\ln\frac{1+x}{\sqrt{1+x^2}}+5^{\cos\sqrt{x}}-sh5x\cdot ch^2 x.$	4. $y(x)=(x+1)^{\frac{1}{x}}.$
5. $y(x)=\frac{3}{4}\ln\frac{x^2+1}{x^2-1}+0.5arctge^{x-1}.$	6. $y(x)=arctg^3(2x+1)-x\cdot\arcsin\sqrt[3]{x}+1.$
7. $x(t)=a(t-\sin 2t), y(t)=a(1-\cos 2t).$	8. $x^3+\ln y-x^2\cdot e^y=0.$
9. $y(x)=x^2\sin 2x, y''''(x)=?$	10. $x(t)=\sqrt{3}\cos t, y(t)=\sin 2t; t_0=\pi/6.$
11. $\lim\limits_{x\to 0}\frac{7^{2x}-5^{3x}}{2x-arctg3x};\quad \lim\limits_{x\to\infty}\left[\frac{x^3+x+1}{x^3+2}\right]^{2x^2};\quad \lim\limits_{x\to 0} ctgx\cdot ctg(\frac{\pi}{2}-x).$	
12. $y(x)=x-\sqrt{x+2}+5; a=-1, b=8.$	13. $y(x)=\frac{x^2-5}{2x+3}.$
14. $y(x)=-\frac{12\cdot\sqrt[3]{6(x-1)^2}}{x^2+2x+9}.$	

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1. $y(x)=\sqrt[3]{\frac{x(x^2+1)}{\sin^2 x}}-\frac{2}{\sqrt{1-x^2}}.$	2. $y(x)=2(tg\sqrt{x}-\sqrt{x})+\arcsin\sqrt{1-x^2}.$
3. $y(x)=\ln\ln(x+1)-2x^3\cdot 3^{\sqrt{x}}+\frac{2^5\cdot e^x}{3^{4x}}+th3.$	4. $y(x)=cth(tgx)-th(ctgx)+3\cdot sh^2\frac{x}{15}.$
5. $y(x)=(x)^{\frac{x}{\ln^2 x}}.$	6. $y(x)=\ln\sqrt[4]{\frac{x^2+x-1}{x^2-x+1}}+a^2\cdot\arcsin\frac{x}{a}+5\exp(\ln 2x).$
7. $x(t)=\ln t^2, y(t)=2\sin 2t.$	8. $x^3+y^3-3xy=0.$
9. $y(x)=\exp(-x^2), y''(x)=?$	10. $x(t)=\frac{1-t}{t^2}, y(t)=\frac{1+2t}{t}; t_0=2.$
11. $\lim\limits_{x\to 0}\frac{e^{3x}-e^{-2x}}{2\arcsin x-\sin x};\quad \lim\limits_{x\to\infty}\left[\frac{x+3}{x-1}\right]^{-x^2};\quad \lim\limits_{x\to\pi/3}\frac{1-\cos 2x}{\pi-3x}.$	
12. $y(x)=x+\frac{8}{x^2}+5; a=1, b=5.$	13. $y(x)=\frac{\sqrt{x^2+5x-1}}{x-4}.$
14. $y(x)=\sqrt[3]{x^2(x+2)^2}.$	

1. $y(x)=\dfrac{8-3\cdot\sqrt{x^3}+2x}{1+6x\sqrt{x}-3x^2}$.	2. $y(x)=\dfrac{\sin x-\cos x}{\sin x+\cos x}+tgx^2$.
3. $y(x)=tg\left(\dfrac{x^2}{2}+1\right)+tg3+arctg\dfrac{x+1}{x-1}$.	4. $y(x)=0.5\ln tg\dfrac{x^2}{2}-2\ln\dfrac{\cos x}{2\sin^2 x}$.
5. $y(x)=\dfrac{x^2\cdot\exp(x^2)}{x^2+1}+\sqrt[x]{3}$.	6. $y(x)=\left(x^2+3\right)^{\sqrt{x}}$.
7. $x(t)=2\ln\cos t, y(t)=tgt+ctgt$.	8. $y(x)=x^{\sin(2x+1)}$.
9. $x(t)=esp(t), y(t)=\ln t; d^3y/dx^3=?$	10. $x(t)=at\cos t, y(t)=at\sin t; t_0=\pi/4$.
11. $\lim\limits_{x\to 0}\dfrac{e^x+e^{-x}-2}{\sin^2 x}$; $\lim\limits_{x\to\infty}\left[\dfrac{3x^2-5}{3x^2-5x+7}\right]^{x+1}$; $\lim\limits_{x\to 0}\dfrac{3x^2-5x}{\sin 3x}$.	
12. $y(x)=\dfrac{x}{1-x^2}; a=0, b=3$.	13. $y(x)=\dfrac{x^3+4x^2+1}{x^2\sqrt{x^2-4}}$.
14. $y(x)=-(x+1)\exp(x+2)$.	

1. $y(x)=\dfrac{(x^2-3)^2\cdot\sqrt[6]{x+1}}{\sqrt[3]{x+7}\cdot\sqrt{x-3}}$.	2. $y(x)=\sqrt{x+\sqrt{x+\sqrt{x}}}$.
3. $y(x)=ctg^2\dfrac{x+1}{3}+ctg\dfrac{x^2+1}{4}-\arccos\dfrac{2x}{1+x^2}$.	4. $y(x)=\dfrac{\sin x}{2\cos^2 x}-0.5\ln tg(\dfrac{\pi}{4}+\dfrac{x}{2})-sh^2x^3+ch2x$.
5. $y(x)=(\ln 2x)^{x^2}$.	6. $x^4-6x^2y^2+9y^4-5x^2-100=0$.
7. $x(t)=\cos^3 t, y(t)=\sin^3 t$.	8. $y(x)=e^x\sin x-e^x\cos x$.
9. $y(x)=x\cdot\sin^2 x; y'''(x)=?$	10. $x(t)=2\ln ctgt+1, y(t)=tgt+ctgt; t_0=\pi/4$.
11. $\lim\limits_{x\to -1}\dfrac{x^3+1}{\sin(x+1)}$; $\lim\limits_{x\to\infty}\left[\dfrac{x^2-1}{x^2}\right]^{x^2}$; $\lim\limits_{x\to 0}\dfrac{\sin 4x}{\sqrt{x+1}-1}$.	
12. $y(x)=1-2x-\dfrac{1}{x^2}$. $a=1, b=4$.	13. $y(x)=\dfrac{\sqrt{2x^2-x}}{x+1`}$.
14. $y(x)=\sqrt[3]{x(x-1)^2}$.	

1. $y(x)=\frac{2}{7}x\cdot\sqrt{x}-\frac{4}{5}x\cdot\sqrt[3]{x}+\frac{2}{15}x\cdot\sqrt[5]{x}$.	2. $y(x)=\frac{2}{\sqrt{a^2-b^2}}arctg\left[\sqrt{\frac{a-b}{a+b}}tg\frac{x}{2}\right]+3tg(tgx).$
3. $y(x)=\ln\sqrt[5]{\frac{x^3-x+1}{x^2+4x+1}}-2^{\cos(x)-\cos^2(x)}$.	4. $y(x)=\ln^2\cos^3(4x-1)-th(2e^x-1)+che^3$.
5. $y(x)=\left[\frac{x}{x+1}\right]^x$.	6. $y^2x^3+5xy+4=0.$
7. $x(t)=\ln 2t, y(t)=\frac{1}{1-t^2}$.	8. $y(x)=\sin\left(\frac{\pi}{2}-\arcsin x\right)$.
9. $y(x)=(x^3+3)\exp(x+1), y''''(x)=?$	10. $x(t)=\arcsin\frac{1}{\sqrt{1+t^2}}, y(t)=\arccos\frac{1}{\sqrt{1+t^2}}; t_0=1.$
11. $\lim\limits_{x\to\pi/3}\frac{1-2\cos x}{\sin(\pi-3x)}$; $\lim\limits_{x\to 0}[1-\ln\cos x]^{\frac{1}{tg^2x}}$; $\lim\limits_{x\to 0}\frac{2x\sin x}{1-\cos x}$.	
12. $y(x)=x^2+2x+\frac{4}{x-1}; a=2, b=5.$	13. $y(x)=\ln\frac{x-3}{x}+5$.
14. $y(x)=\frac{x^3+x^2-3x-1}{2x^2-2}$.	

1. $y(x)=\sqrt{1+x^2}+\ln\left(\frac{1}{x}-\sqrt{1+\frac{1}{x^2}}\right)$.	2. $y(x)=\sin\frac{1}{x}\cdot\arcsin\frac{1}{x^2}+\frac{1}{1+\cos 4x}.$
3. $y(x)=\frac{x^2\ln^2 tgx}{\ln\sin^3 2}+\cos\sqrt{x}\cdot\exp(0.5tg^2x)$	4. $y(x)=arctge^{2x}+\ln\sqrt{\frac{e^{2x}}{e^{2x}-1}}-\sin e^{-x}\cdot\cos e^{-x}.$
5. $y(x)=\sin(2x-3y)$.	6. $y(x)=\frac{x^x}{e^{-x}}.$
7. $x(t)=t(1-\sin t), y(t)=t\cdot\cos t.$	8. $y(x)=\frac{x}{chx^2}.$
9. $y(x)=(1-2x^2)\cos x; y''''(x)=?$	10. $x(t)=2t-t^2, y(t)=3t-t^3; t_0=1.$
11. $\lim\limits_{x\to\pi/4}\frac{\sin x-\cos x}{\ln tgx}$; $\lim\limits_{x\to\pi}\left[ctg\frac{x}{4}\right]^{\frac{1}{\cos\left(\frac{x}{2}\right)}}$; $\lim\limits_{x\to 0}\frac{tgx-\sin x}{\sin^3 x}$.	
12. $y(x)=3-3\ln\frac{x}{x+4}$. $a=1, b=4.$	13. $y(x)=\frac{3x^4+2x^2+5x-1}{2x^3-1}$.
14. $y(x)=\frac{3x^2-10}{3-2x}.$	

1. $y(x)=\frac{1}{4\sqrt{2}}\ln\frac{x^2+x\sqrt{2}-1}{x^2-x\sqrt{2}+1}-\frac{1}{2\sqrt{2}}arctg\frac{x\sqrt{2}}{1-x^2}$.	2. $y(x)=1-\exp(\sin^2 3x)\cdot\cos^2 3x+sh^2 x.$
3. $y(x)=\frac{(1-x^4)^2\cdot\sqrt[3]{2+6x}}{(0.6x^6-0.5)^7 x^5}$	4. $y(x)=(\cos x)^{\sin x}$.
5. $e^x+e^y-2^{x\cdot y}-1=0.$	6. $y(x)=\exp(arctg\sqrt{x})\cdot(\sqrt[3]{4x^3+2})^2+\ln\sqrt[4]{\frac{x-1}{x+1}}$.
7. $x(t)=\ln 2t, y(t)=\sin 2t.$	8. $y(x)=x^5\cdot\exp\left(\frac{x}{2}\right)+\cos 2x.$
9. $y(x)=x^4\cdot\exp\left(\frac{x}{2}\right); y''''(x)=?$	10. $x(t)=\frac{1+\ln t}{t^2}, y(t)=\frac{3+2\ln t}{t}; t_0=1.$
11. $\lim\limits_{x\to 0}\frac{\exp(\sin 2x)-\exp(\sin x)}{tgx}$; $\lim\limits_{x\to 3}\left[\frac{\sin x}{\sin 3}\right]^{\frac{1}{x-3}}$; $\lim\limits_{x\to 0}\frac{arctg2x}{\sin 3x}$.	
12. $y(x)=\frac{3x^2-10}{3-2x}; a=1, b=5.$	13. $y(x)=\frac{x^2+5}{\sqrt[3]{x^6-1}}$.
14. $y(x)=\frac{x^2}{(x-1)^2}$.	

1. $y(x)=\frac{(x^4+3)^3(x^2+1)^7}{\sqrt[3]{x-1}}$.	2. $y(x)=\sqrt{1+\sin 2x}-\sqrt{1-\sin 2x}+\left[\frac{\sin x}{1+\cos x}\right]^2$.
3. $y(x)=\ln\ln x\cdot(\ln\ln\ln x-1)-2\ln(\exp(\arcsin\sqrt{x^2-1}))$.	4. $y(x)=x^2\cdot ch\sqrt{x}-\frac{arctg5x}{\arcsin 2x}$.
5. $y(x)=(x^2+1)^{2x}$.	6. $arctgy-y+x=0$.
7. $x(t)=\frac{3t}{1+t^3}, y(t)=\frac{3t^2}{1+t^3}$.	8. $y(x)=\frac{1}{4\sqrt{2}}\ln\frac{x^2+x\sqrt{2}+1}{x^2-x\sqrt{2}+1}$.
9. $x(t)=e^{-t}, y(x)=t^3; y'''(x)=?$	10. $x(t)=0.5t^2-0.25t^4, y(t)=0.5t^2+\frac{t^3}{3}; t_0=0.$
11. $\lim\limits_{x\to 10}\frac{\lg x-1}{\sqrt{x-9}-1}$; $\lim\limits_{x\to 1}\left[\frac{1}{x}\right]^{\frac{\ln(x+1)}{\ln(2-x)}}$; $\lim\limits_{x\to 0}\frac{\sqrt{1-\cos 4x}}{x}$.	
12. $y(x)=\frac{3x^2-7}{2x+1}; a=0, b=4.$	13. $y(x)=\frac{x^4+3x^2+x-5}{4x^3-x}$.
14. $y(x)=2x-3\sqrt[3]{x^2}$.	

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1. $y(x)=\dfrac{(x+6)^{10}}{(3x+1)^2\sqrt{x^3+2x^2+4}}$.	2. $y(x)=arctg(x+1)-2\ln\dfrac{x+1}{x^2+2x+2}$.
3. $y(x)=x^2+2\sin x\cos x\cdot\exp(x)+\cos^2 x.$	4. $y(x)=\sin\ln x\cdot\cos\ln x-\ln\dfrac{1}{x}$.
5. $y(x)=e^x-\sin e^x\cdot\cos^3 e^x-\sin^3 e^x\cdot\cos e^x$.	6. $y(x)=(\cos x)^{\frac{1}{x}}$.
7. $x(t)=t^3+3t+1, y(t)=3t^5+5t^3+1.$	8. $y(x)=0.5(x^2-1)arctgx+0.5x.$
9. $y(x)=\dfrac{1}{x^2(x-1)}; y'''(x)=?$	10. $x(t)=\dfrac{1+t^2}{t^2-1}, y(t)=\dfrac{t}{t^2-1}; t_0=2.$
11. $\lim\limits_{x\to 0}\dfrac{\sqrt{\cos x}-1}{\sin^2 2x}$; $\lim\limits_{x\to 1}\left[\dfrac{2-x}{x}\right]^{\frac{1}{\ln(2-x)}}$; $\lim\limits_{x\to 4}\dfrac{2^x-16}{\sin(\pi\cdot x)}$.	
12. $y(x)=2\ln x+x^2-4x+3; a=1, b=3.$	13. $y(x)=\dfrac{2x^2+7}{7x-1}$.
14. $y(x)=6x-6-9\sqrt[3]{(x-1)^2}$.	

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1. $y(x)=\dfrac{(x+2)^2}{(x+1)^3(x+3)^4}$.	2. $y(x)=\ln\dfrac{\sqrt{5}+tg\dfrac{x}{2}}{\sqrt{5}-tg\dfrac{x}{2}}+2\ln\left(\sin\sqrt{x}\cdot tg\sqrt{x}\right)-\sqrt{x}$.
3. $y(x)=\dfrac{x\cdot\sin x}{1+tgx}+arctg\dfrac{2x}{1-x^2}$.	4. $y(x)=3x\cdot\sin^3 x+3\cos x-\cos^3 x+ch^3 4x+sh\sqrt[3]{x}$
5. $y(x)=\sqrt[x]{2x\cdot\sin x+1}.$	6. $x^2y+arctg\dfrac{y}{x}=0.$
7. $x(t)=\sqrt{t}, y(t)=\sqrt[3]{t}.$	8. $y(x)=\dfrac{x-\exp(2x)}{x+\exp(2x)}.$
9. $y(x)=\arcsin x; y'''(x)=?$	10. $x(t)=\ln(1+t^2), y(t)=t-arctgt; y_0=1.$
11. $\lim\limits_{x\to 0}\dfrac{\sin 2x-2\sin x}{x\cdot\ln\cos 5x}$; $\lim\limits_{x\to \pi/4}[tgx]^{ctg\,4x}$; $\lim\limits_{x\to 1}\dfrac{x^2-1}{\ln x}$.	
12. $y(x)=x^2-4x-(x-2)\ln(x-1); a=2, b=4.$	13. $y(x)=\dfrac{x^2+3}{\sqrt{x^2-1}}$.
14. $y(x)=-(x^2-4)^2.$	

1. $y(x)=\dfrac{(x-2)^9}{\sqrt{(x-1)^5(x-3)^{11}}}$.	2. $y(x)=\ln\dfrac{2\ln^2\sin x+3}{2\ln^2\sin x-3}$.
3. $y(x)=\dfrac{a^x}{1+a^{2x}}-\dfrac{1-a^{2x}}{1+a^{2x}}arctg(a^{-x})$.	4. $y(x)=x^{x^3}$.
5. $y(x)=\sqrt{\dfrac{1}{1+\sqrt{1+x^2}}}-\ln\sqrt{1+ctg^2x}$.	6. $y(x)=x\cdot\arccos x-\sqrt{1-x^2}+arctg\sqrt{2}$.
7. $x(t)=\dfrac{2}{3}t\sqrt{t}, y(t)=\sqrt{t}\cdot\exp(\sqrt{t}).$	8. $y(x)=\ln\sqrt{1+ctg^2x}$.
9. $y(x)=arctgx; y'''(x)=?$	10. $x(t)=\dfrac{t+1}{t}, y(t)=\dfrac{t-1}{t}; t_0=-1.$
11. $\lim\limits_{x\to1}\dfrac{1-x}{\log_2 x}$; $\lim\limits_{x\to2\pi}[\cos x]^{\frac{1}{\sin^2 2x}}$; $\lim\limits_{x\to-2}\dfrac{\sqrt[3]{x-6}+2}{(x+2)^3}$.	
12. $y(x)=\dfrac{\exp(2-x)}{2-x}; a=-1, b=1.$	13. $y(x)=\dfrac{x^2-2x+5}{x(x-1)}$.
14. $y(x)=1-\sqrt[3]{x^2+2x}.$	

1. $y(x)=\ln\dfrac{\sqrt[4]{x^2+3x+1}}{\sqrt[3]{x^2+4}}$.	2. $y(x)=0.5tg^3(\sin x)+\ln\cos(\sin x)+\exp(\sin x^2).$
3. $y(x)=\arcsin\dfrac{\sin x}{\sqrt{1+\sin^2 x}}+\dfrac{1+\sin^2 x}{\cos x}$.	4 $y(x)=x^2\cdot\exp(x^2)-\ln ch\sqrt{x}+\dfrac{2x}{\ln 2}$.
5. $y(x)=x^{\ln x}$.	6. $y(x)=\sqrt[3]{x^2}\,\dfrac{1-x}{1+x^2}\cos x-\sin^3 x\cos^2 x$.
7. $x(t)=cht, y(t)=sht.$	8. $\exp(x)\cdot\sin y-\exp(-y)\cdot\cos x=0.$
9. $y(x)=\exp(x^2)\cdot\sin x; y'''(x)=?$	10. $x(t)=1-t^2, y(t)=t-t^3; t_0=2.$
11. $\lim\limits_{x\to0}\dfrac{\sqrt{x+2}-\sqrt{2}}{\sin 3x}$; $\lim\limits_{x\to\pi/2}[1+\cos 3x]^{\sec\frac{\pi}{2}}$; $\lim\limits_{x\to16}\dfrac{\sqrt[4]{x}-2}{\sqrt{x}-4}$.	
12. $y(x)=2\ln\dfrac{x}{x+1}-1$. $a=1, b=4.$	13. $y(x)=\dfrac{x-16}{\sqrt{x^2-8}}$.
14. $y(x)=1-\sqrt[3]{x^2+2x}.$	

1. $y(x)=x\cdot\sqrt[3]{\dfrac{x(x-1)}{x-2}}$.	2. $y(x)=x\cdot\sin 3x\cos\dfrac{x}{5}+0.5\cos^2 x.$
3. $y(x)=\sqrt{2x+1}\left[\ln(2x+1)-2x\right]+\arccos\left(2x\cdot\sqrt{1-x^2}\right)$.	4. $y(x)=\ln\dfrac{tg\dfrac{x}{2}-1+\sqrt{2}}{tg\dfrac{x}{2}-1-\sqrt{2}}+9\ln\sqrt[9]{\dfrac{x(x-1)}{x+2}}$.
5. $y(x)=x^{\sin(x+1)}$.	6. $\ln x+\exp\left(\dfrac{-y}{x}\right)=2.$
7. $x(t)=\dfrac{2at}{1+t^2}, y(t)=\dfrac{a(1-t^2)}{1+t^2}.$	8. $y(x)=\arccos\sqrt{1-2^x}.$
9. $y(x)=\dfrac{1-\cos x}{\sin x}; y'''(x)=?$	10. $x(t)=t(1-\sin t), y(t)=t\cos t; t_0=0.$
11. $\lim\limits_{x\to 0}\dfrac{1-\sqrt{\cos x}}{1-\cos\sqrt{x}}$; $\lim\limits_{x\to\pi/2}\left[tgx\dfrac{x}{2}\right]^{\frac{\pi}{2}-x}$; $\lim\limits_{x\to 4}\dfrac{\sqrt{x}-2}{\sqrt[3]{x^2}-16}$.	
12. $y(x)=\dfrac{x^2+4}{x^2}$. $a=1, b=4.$	13. $y(x)=\dfrac{8x-x^2}{\sqrt[3]{x^3-1}}.$
14. $y(x)=\dfrac{(x+1)^2}{(x-1)^2}.$	

1. $y(x)=\dfrac{\sqrt{x-1}}{\sqrt[3]{(x+2)^2}\sqrt{(x+3)^3}}$.	2. $y(x)=2\cos(3x-1)\sin 2x+\cos(3x^2-1)+\sin 4.$.
3. $y(x)=arctg\dfrac{x\cdot\sin x}{1-x\cdot\cos\alpha}$.	4 $y(x)=3\sin(xe^x-e^x)-\sin^3(xe^x-e^x)+\sqrt{1+sh^2 4x}.$
5. $y(x)=(\sin x)^{tgx}$.	6. $y(x)=\dfrac{1}{6}\ln\dfrac{(x+1)^2}{x^2-x+1}+\dfrac{1}{\sqrt{3}}arctg\dfrac{2x-1}{\sqrt{3}}.$
7. $x(t)=\sqrt{t^2+1}, y(t)=\dfrac{t-1}{\sqrt{t^2+1}}.$	8. $y(x)=\sqrt{1+\arcsin x}.$
9. $y(x)=(x^2-5x^3)\sin 2x; y'''(x)=?$	10. $x(t)=t^3+1, y(t)=t^2+t+1; t_0=1.$
11. $\lim\limits_{x\to 1}\dfrac{xe^x-e}{\sin(x^2-1)}$; $\lim\limits_{x\to 3}\left[\dfrac{9-2x}{3}\right]^{tg\frac{\pi\cdot x}{6}}$; $\lim\limits_{x\to -8}\dfrac{\sqrt{1-x}-3}{(2+\sqrt[3]{x})^2}$.	
12. $y(x)=\sqrt[3]{x(x-3)}; a=-1, b=4$	13. $y(x)=\dfrac{\sqrt[3]{x^2-1}\cdot\sqrt[3]{x+5}}{2}$.
14. $y(x)=\sqrt[3]{x(x-1)^2}.$	

1. $y(x)=\sqrt[3]{\frac{x(x^2+1)}{(x^2-1)^3}}+\sqrt[3]{1+x\sqrt{x+3}}$.	2. $y(x)=\arccos\frac{2x-1}{\sqrt{3}}-0.5\arcsin\frac{x}{\sqrt{1+x^2}}$.
3. $y(x)=tg\frac{x^2+1}{2}+\frac{\sin x+\cos x}{\sin x-\cos x}+\exp\left(\sin\sqrt{1+x}\right)$.	4. $y(x)=\ln^3\cos\frac{x-1}{x}+\sqrt[3]{\ln\sin\frac{x+3}{4}}-\ln chx$.
5. $y(x)=x^{\pi/x}$.	6. $\cos^2(x+y)=1$.
7. $x(t)=\ln(1+t^2), y(t)=arctgt^2$.	8. $x(t)=t^2+2, y(t)=\frac{t^3}{3-t}$.
9. $y(x)=x^6\cdot 5^{\sqrt{1-x^4}}; y'''(x)=?$	10. $x(t)=2tgt, y(t)=2\sin^2 t+\sin 2t; t_0=\pi/4$.
11. $\lim\limits_{x\to 3}\frac{\log_3 x-1}{tg(\pi\cdot x)}$; $\lim\limits_{x\to\alpha}\left[\frac{\sin x}{\sin\alpha}\right]^{\frac{1}{x-\alpha}}$; $\lim\limits_{x\to\infty}\frac{(3-x)^3}{(x+1)^2-(x+1)^3}$.	
12. $y(x)=\exp(\sqrt{2}\cos x); a=-\pi/2; b=\pi/2$.	13. $y(x)=\ln\left(\frac{1}{x}\right)-x$.
14. $y(x)=\frac{x^2(x-4)^2}{16}$.	

1. $y(x)=\frac{2x^2}{\sqrt{1+2x^3}}-4\cdot\sqrt[3]{5x^2-\sqrt{3}}$.	2. $y(x)=\frac{x}{\sin^2 3x+\cos^2 2x}+tg^3\frac{x+1}{2}ctg^5 5x$.
3. $y(x)=\ln\sqrt{\ln x+1}+\ln^2(\sqrt{x}+1)+\sin x\cdot\exp(\cos x)$.	4. $y(x)=\frac{(tg^2x-1)(tg^4x+10tg^2x+x^2)}{3tg^3x}$.
5. $y(x)=(arctgx)^{3x}$.	6. $arctg\frac{y}{x}=0.5\ln(x^2+y^2)$.
7. $x(t)=1+\exp(5t^2), y(t)=5t^2-\exp(-5t^2)$.	8. $y(x)=5^{-x^2}\cdot\arcsin 5^{x^2}$.
9. $y(x)=\frac{x}{x^2-1}; y'''(x)=?$	10. $x(t)=\sin t, y(t)=a^t; t_0=0$.
11. $\lim\limits_{x\to 0}\frac{1+x\cdot\sin x-\cos 2x}{\sin^2 x}$; $\lim\limits_{x\to 1}\left(\frac{3x-1}{x+1}\right)^{-(x-1)}$; $\lim\limits_{x\to\infty}\frac{8x^3-2x}{(x+1)^4-(x-1)^4}$.	
12. $y(x)=\sqrt[3]{\sin x}; a=0, b=\pi$.	13. $y(x)=\frac{x^2-2x+5}{x-3}$.
14. $y(x)=2\ln\frac{x}{x+1}-1$.	