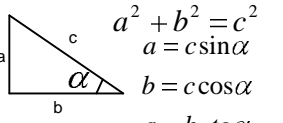
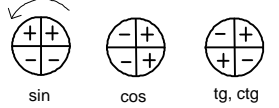
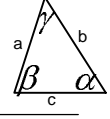


<p><b>Свойства степеней и корней</b></p> $(abc)^n = a^n b^n c^n$ $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$ $a^m a^n = a^{m+n}$ $\frac{a^m}{a^n} = a^{m-n}$ $\sqrt[n]{a} = \sqrt[n]{a^n}$ $\sqrt[n]{a} = \sqrt[n]{\sqrt[n]{a}}$ $\sqrt[n]{abc\dots} = \sqrt[n]{a} \cdot \sqrt[n]{b} \cdot \sqrt[n]{c} \dots$ $\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$ $\left(\sqrt[n]{a}\right)^n = \sqrt[n]{a^n}$	<p><b>Свойства интегралов</b></p> $\int k \cdot f(x) dx = k \int f(x) dx$ $\int (f(x) + g(x)) dx = \int f(x) dx + \int g(x) dx$ $\int_a^b f(x) dx = F(b) - F(a) = F(x) \Big _a^b$ $\int_a^a f(x) dx = 0$ $\int_a^b f(x) dx = - \int_b^a f(x) dx$ $\int_a^b f(x) dx = \int_a^c f(x) dx + \int_c^b f(x) dx$ $\int_a^b k \cdot f(x) dx = k \cdot \int_a^b f(x) dx$	<p><b>Тригонометр. тождества</b></p> $\sin^2 a + \cos^2 a = 1$ $tga = \frac{\sin a}{\cos a}$ $ctga = \frac{\cos a}{\sin a}$ $tga \cdot ctga = 1$ $tg^2 a + 1 = \frac{1}{\cos^2 a}$ $ctg^2 a + 1 = \frac{1}{\sin^2 a}$	<p><b>Геометрическая прогрессия</b></p> $b_n = b_1 \cdot q^{n-1}$ $\frac{b_n}{b_{n-1}} = \frac{b_{n+1}}{b_n}$ $b_n^2 = b_{n-1} \cdot b_{n+1}$ $S_n = \frac{b_1(1-q^n)}{1-q}$ <p><b>Арифметическая прогрессия</b></p> $a_n = a_{n-1} + d = a_1 + (n-1)d$ $a_n - a_{n-1} = a_{n+1} - a_n$ $a_n = \frac{a_{n-1} + a_{n+1}}{2}$ $S_n = \frac{a_1 + a_n}{2} n = \frac{2a_1 + d(n-1)}{2} n$	<p><b>Геометрическая прогрессия</b></p>  $a^2 + b^2 = c^2$ $a = c \sin \alpha$ $b = c \cos \alpha$ $a = b \cdot tg \alpha$ $\frac{\sin \alpha}{a} = \frac{\sin \beta}{b} = \frac{\sin \gamma}{c}$ $a^2 = b^2 + c^2 - 2bc \cos \alpha$	 $\sin a \cdot \sin b = \frac{1}{2}(\cos(a-b) - \cos(a+b))$ $\cos a \cdot \cos b = \frac{1}{2}(\cos(a-b) + \cos(a+b))$ $\sin a \cdot \cos b = \frac{1}{2}(\sin(a-b) + \sin(a+b))$																																																																																																																																							
<p><b>Свойства логарифмов</b></p> $\log_a 1 = 0$ $\log_a (x_1 \cdot x_2) = \log_a  x_1  + \log_a  x_2 $ $\log_a \frac{x_1}{x_2} = \log_a  x_1  - \log_a  x_2 $ $\log_a x^p = p \log_a x$ $\log_a x = \frac{\log_b x}{\log_b a}$ $\log_a x = \frac{1}{q} \log_a x$ $\lg 10^n = n$ $\ln e^n = n$	<p><b>Таблица интегралов</b></p> $\int x^n dx = \frac{x^{n+1}}{n+1} + C; n \neq -1$ $\int \frac{dx}{x} = \ln x  + C$ $\int a^x dx = \frac{a^x}{\ln a} + C; (a > 0); \int e^x dx = e^x + C$ $\int \sin x dx = -\cos x + C$ $\int \cos x dx = \sin x + C$ $\int \frac{dx}{x^2 + a^2} = \frac{1}{a} \operatorname{arctg} \frac{x}{a} + C; (a \neq 0)$ $\int \frac{dx}{x^2 - a^2} = \frac{1}{2a} \ln \left  \frac{x-a}{x+a} \right  + C; (a \neq 0)$ $\int \frac{dx}{a^2 - x^2} = \frac{1}{2a} \ln \left  \frac{a+x}{a-x} \right  + C; (a \neq 0)$ $\int \frac{dx}{\sqrt{a^2 - x^2}} = \arcsin \frac{x}{a} + C = -\arccos \frac{x}{a} + C; (a > 0)$ $\int \frac{dx}{\sqrt{x^2 + a}} = \ln x + \sqrt{x^2 + a}  + C; (a \neq 0)$ $\int \frac{dx}{\cos^2 x} = tgx + C$ $\int \frac{dx}{\sin x} = \ln \left  tg \frac{x}{2} \right  + C = \ln  \cos ecx - ctgx  + C$ $\int \frac{dx}{\sin^2 x} = -ctgx + C$ $\int \frac{dx}{\cos x} = \ln \left  tg \left( \frac{x}{2} + \frac{\pi}{4} \right) \right  + C = \ln  tgx + \sec x  + C$ $\int shx dx = chx + C$ $\int chx dx = shx + C$ $\int \frac{dx}{ch^2 x} = thx + C$ $\int \frac{dx}{sh^2 x} = -cthx + C$	<p><b>Формулы сложения тригон. Ф-ий.</b></p> $\cos(a-b) = \cos a \cdot \cos b + \sin a \cdot \sin b$ $\cos(a+b) = \cos a \cdot \cos b - \sin a \cdot \sin b$ $\sin(a-b) = \sin a \cdot \cos b - \cos a \cdot \sin b$ $\sin(a+b) = \sin a \cdot \cos b + \cos a \cdot \sin b$ $tg(a+b) = \frac{tga + tgb}{1 - tga \cdot tgb}$ $tg(a-b) = \frac{tga - tgb}{1 + tga \cdot tgb}$	<p><b>Арифметическая прогрессия</b></p> $a_n = a_{n-1} + d = a_1 + (n-1)d$ $a_n - a_{n-1} = a_{n+1} - a_n$ $a_n = \frac{a_{n-1} + a_{n+1}}{2}$ $S_n = \frac{a_1 + a_n}{2} n = \frac{2a_1 + d(n-1)}{2} n$ $a^2 - b^2 = (a-b)(a+b)$ $(a+b)^2 = a^2 + 2ab + b^2$ $(a-b)^2 = a^2 - 2ab + b^2$ $(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$ $(a-b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$ $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$ $a^3 - b^3 = (a-b)(a^2 + ab + b^2)$	<p><b>Арифметическая прогрессия</b></p>  $S = \frac{1}{2} ab \sin \gamma$ $p = \frac{1}{2} (a+b+c)$ $S = \sqrt{p(p-a)(p-b)(p-c)}$ $S = \frac{1}{2} hc$ <p><b>Геометрическая прогрессия</b></p> $V = SH \text{ призма}$ $V = \frac{1}{3} SH \text{ пирамида}$ $\begin{cases} S_{бок} = 2\pi RH \\ V = \pi R^2 H \end{cases} \text{ цилиндр}$ $\begin{cases} S_{бок} = 2\pi Rl \\ V = \frac{1}{3} \pi R^2 H \end{cases} \text{ конус}$ $\begin{cases} S = 4\pi R^2 \\ V = \frac{4}{3} \pi R^3 \end{cases} \text{ шар}$ $\begin{cases} S = 2\pi RH \\ V = \pi H^2 \left( R - \frac{H}{3} \right) \end{cases} \text{ сегмент шара}$	<p><b>Ф-лы понижения степени</b></p> $\sin^2 a = \frac{1 - \cos 2a}{2}$ $\cos^2 a = \frac{1 + \cos 2a}{2}$ $tg^2 a = \frac{1 - \cos 2a}{1 + \cos 2a}$ $\sin^3 a = \frac{1}{4} (3 \sin a - \sin 3a)$ $\cos^3 a = \frac{1}{4} (\cos 3a + 3 \cos a)$																																																																																																																																							
<p><b>Производные</b></p> $(x^a)^y = ax^{a-1}$ $(a^x)^y = a^x \ln a; a > 0$ $(e^x)^y = e^x$ $(\log_a x)^y = \frac{1}{x \ln a}$ $(\ln x)^y = \frac{1}{x}$ $(\sin x)^y = \cos x$ $(\cos x)^y = -\sin x$ $(tgx)^y = \frac{1}{\cos^2 x}$ $(ctgx)^y = -\frac{1}{\sin^2 x}$	<p><b>Ф-ий крайних углов</b></p> $\sin 2a = 2 \sin a \cdot \cos a$ $\cos 2a = \cos^2 a - \sin^2 a$ $\cos 2a = 1 - 2 \sin^2 a$ $\cos 2a = 2 \cos^2 a - 1$ $tg 2a = \frac{2tga}{1 - tg^2 a}$	<p><b>Сумма триг. Ф-ий</b></p> $\sin a + \sin b = 2 \sin \frac{a+b}{2} \cdot \cos \frac{a-b}{2}$ $\sin a - \sin b = 2 \sin \frac{a-b}{2} \cdot \cos \frac{a+b}{2}$ $\cos a + \cos b = 2 \cos \frac{a+b}{2} \cdot \cos \frac{a-b}{2}$ $\cos a - \cos b = -2 \sin \frac{a-b}{2} \cdot \sin \frac{a+b}{2}$	<p><b>У-е корней и т. Виета</b></p> $ax^2 + bx + c = 0$ $x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $\begin{cases} x_1 - x_2 = -\frac{b}{a} \\ x_1 \cdot x_2 = \frac{c}{a} \end{cases}$	<p><b>У-е корней и т. Виета</b></p> $ax^2 + bx + c = 0$ $x_0 = -\frac{b}{2a}$	<p><b>Радиусы правильных многоугольников</b></p> $n=3 \quad R = \frac{a}{\sqrt{3}} \quad r = \frac{a}{2}$ $n=4 \quad R = \frac{a}{\sqrt{2}} \quad r = \frac{a}{2}$ $n=6 \quad R = a \quad r = \frac{a\sqrt{3}}{2}$ <p><b>Радиусы треугольников</b></p> $R = \frac{abc}{4S}$ $r = \frac{2S}{a+b+c}$																																																																																																																																							
<p><b>Производные</b></p> $(\arcsin x)^y = \frac{1}{\sqrt{1-x^2}}$ $(\arccos x)^y = -\frac{1}{\sqrt{1-x^2}}$ $(\operatorname{arctg} x)^y = \frac{1}{1+x^2}$ $(\operatorname{arctg} x)^y = -\frac{1}{1+x^2}$	<p><b>Уравнение касательной</b></p> $y = f(x_0) + f'(x_0)(x - x_0)$ $y_0 = ax_0^2 + bx_0 + c = \frac{4ac - b^2}{4a}$	<p><b>Уравнение касательной</b></p> $y = f(x_0) + f'(x_0)(x - x_0)$ $y_0 = ax_0^2 + bx_0 + c = \frac{4ac - b^2}{4a}$	<p><b>Координаты вершины параболы</b></p> $y_0 = ax_0^2 + bx_0 + c = \frac{4ac - b^2}{4a}$	<p><b>Координаты вершины параболы</b></p> $y_0 = ax_0^2 + bx_0 + c = \frac{4ac - b^2}{4a}$	<p><b>Координаты вершины параболы</b></p> $y_0 = ax_0^2 + bx_0 + c = \frac{4ac - b^2}{4a}$																																																																																																																																							
					<table border="1"> <thead> <tr> <th><math>x</math></th> <th><math>\pi+x</math></th> <th><math>\pi-x</math></th> <th><math>2\pi+x</math></th> <th><math>2\pi-x</math></th> <th><math>\frac{3\pi}{2}+x</math></th> <th><math>\frac{3\pi}{2}-x</math></th> <th><math>\frac{3\pi}{2}+x</math></th> <th><math>\frac{3\pi}{2}-x</math></th> <th><math>\alpha</math></th> <th>0</th> <th><math>\pi/6</math></th> <th><math>\pi/4</math></th> <th><math>\pi/3</math></th> <th><math>\pi/2</math></th> <th><math>2\pi/3</math></th> <th><math>3\pi/4</math></th> <th><math>5\pi/6</math></th> <th><math>\pi</math></th> <th><math>7\pi/6</math></th> <th><math>5\pi/4</math></th> <th><math>4\pi/3</math></th> <th><math>3\pi/2</math></th> <th><math>5\pi/3</math></th> <th><math>7\pi/4</math></th> <th><math>11\pi/6</math></th> <th><math>2\pi</math></th> </tr> </thead> <tbody> <tr> <td>sinx</td> <td>-sinx</td> <td>sinx</td> <td>sinx</td> <td>-sinx</td> <td>cosx</td> <td>cosx</td> <td>-cosx</td> <td>-cosx</td> <td>sin</td> <td>0</td> <td>1/2</td> <td><math>\sqrt{2}/2</math></td> <td><math>\sqrt{3}/2</math></td> <td>1</td> <td><math>\sqrt{3}/2</math></td> <td><math>\sqrt{2}/2</math></td> <td>1/2</td> <td>0</td> <td>-1/2</td> <td><math>-\sqrt{2}/2</math></td> <td><math>-\sqrt{3}/2</math></td> <td>-1</td> <td><math>-\sqrt{3}/2</math></td> <td><math>-\sqrt{2}/2</math></td> <td>-1/2</td> <td>0</td> </tr> <tr> <td>cosx</td> <td>-cosx</td> <td>-cosx</td> <td>cosx</td> <td>cosx</td> <td>-sinx</td> <td>sinx</td> <td>sinx</td> <td>-sinx</td> <td>cos</td> <td>1</td> <td><math>\sqrt{3}/2</math></td> <td><math>\sqrt{2}/2</math></td> <td>1/2</td> <td>0</td> <td>-1/2</td> <td><math>-\sqrt{2}/2</math></td> <td><math>-\sqrt{3}/2</math></td> <td>-1</td> <td><math>-\sqrt{3}/2</math></td> <td><math>-\sqrt{2}/2</math></td> <td>-1/2</td> <td>0</td> <td>1/2</td> <td><math>\sqrt{2}/2</math></td> <td><math>\sqrt{3}/2</math></td> <td>1</td> </tr> <tr> <td>tgx</td> <td>tgx</td> <td>-tgx</td> <td>tgx</td> <td>-tgx</td> <td>-ctgx</td> <td>ctgx</td> <td>-ctgx</td> <td>ctgx</td> <td>tg</td> <td>0</td> <td><math>1/\sqrt{3}</math></td> <td>1</td> <td><math>\sqrt{3}</math></td> <td></td> <td><math>-\sqrt{3}</math></td> <td>-1</td> <td><math>-1/\sqrt{3}</math></td> <td>0</td> <td><math>1/\sqrt{3}</math></td> <td>1</td> <td><math>\sqrt{3}</math></td> <td></td> <td><math>-\sqrt{3}</math></td> <td>-1</td> <td><math>-1/\sqrt{3}</math></td> <td>0</td> </tr> <tr> <td>ctgx</td> <td>ctgx</td> <td>-ctgx</td> <td>ctgx</td> <td>-ctgx</td> <td>-tgx</td> <td>tgx</td> <td>-tgx</td> <td>tgx</td> <td>ctg</td> <td></td> <td><math>\sqrt{3}</math></td> <td>1</td> <td><math>1/\sqrt{3}</math></td> <td>0</td> <td><math>-1/\sqrt{3}</math></td> <td>-1</td> <td><math>-\sqrt{3}</math></td> <td></td> <td><math>\sqrt{3}</math></td> <td>1</td> <td><math>1/\sqrt{3}</math></td> <td>0</td> <td><math>-1/\sqrt{3}</math></td> <td>-1</td> <td><math>-\sqrt{3}</math></td> <td></td> </tr> </tbody> </table>	$x$	$\pi+x$	$\pi-x$	$2\pi+x$	$2\pi-x$	$\frac{3\pi}{2}+x$	$\frac{3\pi}{2}-x$	$\frac{3\pi}{2}+x$	$\frac{3\pi}{2}-x$	$\alpha$	0	$\pi/6$	$\pi/4$	$\pi/3$	$\pi/2$	$2\pi/3$	$3\pi/4$	$5\pi/6$	$\pi$	$7\pi/6$	$5\pi/4$	$4\pi/3$	$3\pi/2$	$5\pi/3$	$7\pi/4$	$11\pi/6$	$2\pi$	sinx	-sinx	sinx	sinx	-sinx	cosx	cosx	-cosx	-cosx	sin	0	1/2	$\sqrt{2}/2$	$\sqrt{3}/2$	1	$\sqrt{3}/2$	$\sqrt{2}/2$	1/2	0	-1/2	$-\sqrt{2}/2$	$-\sqrt{3}/2$	-1	$-\sqrt{3}/2$	$-\sqrt{2}/2$	-1/2	0	cosx	-cosx	-cosx	cosx	cosx	-sinx	sinx	sinx	-sinx	cos	1	$\sqrt{3}/2$	$\sqrt{2}/2$	1/2	0	-1/2	$-\sqrt{2}/2$	$-\sqrt{3}/2$	-1	$-\sqrt{3}/2$	$-\sqrt{2}/2$	-1/2	0	1/2	$\sqrt{2}/2$	$\sqrt{3}/2$	1	tgx	tgx	-tgx	tgx	-tgx	-ctgx	ctgx	-ctgx	ctgx	tg	0	$1/\sqrt{3}$	1	$\sqrt{3}$		$-\sqrt{3}$	-1	$-1/\sqrt{3}$	0	$1/\sqrt{3}$	1	$\sqrt{3}$		$-\sqrt{3}$	-1	$-1/\sqrt{3}$	0	ctgx	ctgx	-ctgx	ctgx	-ctgx	-tgx	tgx	-tgx	tgx	ctg		$\sqrt{3}$	1	$1/\sqrt{3}$	0	$-1/\sqrt{3}$	-1	$-\sqrt{3}$		$\sqrt{3}$	1	$1/\sqrt{3}$	0	$-1/\sqrt{3}$	-1	$-\sqrt{3}$	
$x$	$\pi+x$	$\pi-x$	$2\pi+x$	$2\pi-x$	$\frac{3\pi}{2}+x$	$\frac{3\pi}{2}-x$	$\frac{3\pi}{2}+x$	$\frac{3\pi}{2}-x$	$\alpha$	0	$\pi/6$	$\pi/4$	$\pi/3$	$\pi/2$	$2\pi/3$	$3\pi/4$	$5\pi/6$	$\pi$	$7\pi/6$	$5\pi/4$	$4\pi/3$	$3\pi/2$	$5\pi/3$	$7\pi/4$	$11\pi/6$	$2\pi$																																																																																																																		
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