	$-\alpha$	$90^\circ-\alpha$	$90^\circ+\alpha$	$180^\circ-\alpha$	$180^\circ+\alpha$	$270^\circ-\alpha$	$270^\circ+\alpha$	$360^\circ-\alpha$	$360^\circ+\alpha$
	$-\alpha$	$\frac{\pi}{2}-\alpha$	$\frac{\pi}{2}+\alpha$	$\pi-\alpha$	$\pi+\alpha$	$\frac{3\pi}{2}-\alpha$	$\frac{3\pi}{2}+\alpha$	$2\pi-\alpha$	$2\pi+\alpha$
sin	-sin α	cos α	cos α	sin α	–sin α	–cos α	–cos α	-sin α	sin α
cos	cos α	sin α	–sin α	–cos α	–cos α	–sin α	sin α	cos α	cos α
tg	-tg α	ctg α	–ctg α	–tg α	tg α	ctg α	–ctg α	–tg α	tg α
ctg	-ctg α	tg α	–tg α	–ctg α	ctg α	tg α	-tg α	-ctg α	ctg α

$$\sin\alpha\cos\beta=\frac{1}{2}(\sin(\alpha+\beta)+\sin(\alpha-\beta))$$

$$\cos\alpha\sin\beta=\frac{1}{2}(\sin(\alpha+\beta)-\sin(\alpha-\beta))$$

$$\cos\alpha\cos\beta=\frac{1}{2}(\cos(\alpha+\beta)+\cos(\alpha-\beta))$$

$$\sin\alpha\sin\beta=-\frac{1}{2}(\cos(\alpha+\beta)-\cos(\alpha-\beta))$$

$$\cos\alpha+\cos\beta=2\cos\frac{\alpha+\beta}{2}\cos\frac{\alpha-\beta}{2}$$

$$\cos\alpha-\cos\beta=-2\sin\frac{\alpha+\beta}{2}\sin\frac{\alpha-\beta}{2}$$

$$\sin\alpha+\sin\beta=2\sin\frac{\alpha+\beta}{2}\cos\frac{\alpha-\beta}{2}$$

$$\sin\alpha-\sin\beta=2\cos\frac{\alpha+\beta}{2}\sin\frac{\alpha-\beta}{2}$$

$$\cos(\alpha+\beta)=\cos\alpha\cos\beta-\sin\alpha\sin\beta$$

$$\cos(\alpha-\beta)=\cos\alpha\cos\beta+\sin\alpha\sin\beta$$

$$\sin(\alpha+\beta)=\sin\alpha\cos\beta+\cos\alpha\sin\beta$$

$$\sin(\alpha-\beta)=\sin\alpha\cos\beta-\cos\alpha\sin\beta$$

$$\sin\alpha=\frac{2\operatorname{tg}\frac{\alpha}{2}}{1+\operatorname{tg}^2\frac{\alpha}{2}}\qquad\cos\alpha=\frac{1-\operatorname{tg}^2\frac{\alpha}{2}}{1+\operatorname{tg}^2\frac{\alpha}{2}}$$

$$\sin^2\alpha=\frac{1-\cos2\alpha}{2}\qquad\cos^2\alpha=\frac{1+\cos2\alpha}{2}$$

$$\sin2\alpha=2\sin\alpha\cos\alpha$$

$$\cos2\alpha=\cos^2\alpha-\sin^2\alpha=1-2\sin^2\alpha$$

$$\sin3\alpha=3\sin\alpha\cos^2\alpha-\sin^3\alpha=3\sin\alpha-4\sin^3\alpha$$

$$\cos3\alpha=\cos^3\alpha-3\sin^2\alpha\cos\alpha=4\cos^3\alpha-3\cos\alpha$$

$$\operatorname{tg}(\alpha+\beta)=\frac{\operatorname{tg}\alpha+\operatorname{tg}\beta}{1-\operatorname{tg}\alpha\operatorname{tg}\beta}$$

$$\operatorname{ctg}(\alpha+\beta)=\frac{\operatorname{ctg}\alpha\operatorname{ctg}\beta-1}{\operatorname{ctg}\alpha+\operatorname{ctg}\beta}$$

$$\operatorname{tg}(\alpha-\beta)=\frac{\operatorname{tg}\alpha-\operatorname{tg}\beta}{1+\operatorname{tg}\alpha\operatorname{tg}\beta}$$

$$\operatorname{ctg}(\alpha-\beta)=\frac{\operatorname{ctg}\alpha\operatorname{ctg}\beta+1}{\operatorname{ctg}\alpha-\operatorname{ctg}\beta}$$

$$\operatorname{tg}\alpha+\operatorname{tg}\beta=\frac{\sin(\alpha+\beta)}{\cos\alpha\cos\beta}$$

$$\operatorname{ctg}\alpha+\operatorname{ctg}\beta=\frac{\sin(\alpha+\beta)}{\sin\alpha\sin\beta}$$

$$\operatorname{tg}\alpha-\operatorname{tg}\beta=\frac{\sin(\alpha-\beta)}{\cos\alpha\cos\beta}$$

$$\operatorname{ctg}\alpha-\operatorname{ctg}\beta=\frac{\sin(\beta-\alpha)}{\sin\alpha\sin\beta}$$

$$\operatorname{tg}\frac{\alpha}{2}=\frac{\sin\alpha}{1+\cos\alpha}\qquad\operatorname{ctg}\frac{\alpha}{2}=\frac{1+\cos\alpha}{\sin\alpha}$$

$$\operatorname{tg}^2\frac{\alpha}{2}=\frac{1-\cos\alpha}{1+\cos\alpha}\qquad\operatorname{ctg}^2\frac{\alpha}{2}=\frac{1+\cos\alpha}{1-\cos\alpha}$$

$$\operatorname{tg}2\alpha=\frac{2\operatorname{tg}\alpha}{1-\operatorname{tg}^2\alpha}\qquad\operatorname{ctg}2\alpha=\frac{\operatorname{ctg}^2\alpha-1}{2\operatorname{ctg}\alpha}$$

$$\sin\alpha+\cos\alpha=\sqrt{2}\cos\left(\frac{\pi}{4}-\alpha\right)$$

$$a\sin\alpha+b\cos\alpha=\sqrt{a^2+b^2}\cdot\cos(\varphi-\alpha)$$

$$\frac{a}{\sqrt{a^2+b^2}}=\sin\varphi;\ \frac{b}{\sqrt{a^2+b^2}}=\cos\varphi$$

$$\arcsin\alpha+\arccos\alpha=\frac{\pi}{2}$$

$$\operatorname{arcctg}\alpha+\operatorname{arctg}\alpha=\frac{\pi}{2}$$

$$\sin x=a\Rightarrow x=(-1)^m\arcsin a+\pi m,m\in Z$$

$$\cos x=a\Rightarrow x=\pm\arccos a+2\pi k,k\in Z$$

$$\operatorname{tg}x=a\Rightarrow x=\operatorname{arctg}a+\pi k,k\in Z$$

$$\operatorname{ctg}x=a\Rightarrow x=\operatorname{arcctg}a+\pi k,k\in Z$$

$$\sin\alpha=\sin\beta\Leftrightarrow\left[\begin{array}{l}\alpha=\beta+2\pi k,k\in Z\\ \alpha=\pi-\beta+2\pi n,n\in Z\end{array}\right.$$

$$\cos\alpha=\cos\beta\Leftrightarrow\alpha=\pm\beta+2\pi k,k\in Z$$

$$\operatorname{tg}\alpha=\operatorname{tg}\beta\Leftrightarrow\left[\begin{array}{l}\alpha=\beta+\pi k,k\in Z\\ \cos\alpha\neq0\\ \cos\beta\neq0\end{array}\right.$$

$$\operatorname{ctg}\alpha=\operatorname{ctg}\beta\Leftrightarrow\left[\begin{array}{l}\alpha=\beta+\pi k,k\in Z\\ \sin\alpha\neq0\\ \sin\beta\neq0\end{array}\right.$$