

$$\cos^2 \alpha + \sin^2 \alpha = 1$$

$$\operatorname{tg} \alpha = \frac{1}{\operatorname{ctg} \alpha}$$

$$1 + \operatorname{ctg}^2 \alpha = \frac{1}{\sin^2 \alpha}$$

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

$$\sin(\alpha \pm \beta) = \sin \alpha \cdot \cos \beta \pm \cos \alpha \cdot \sin \beta$$

$$\cos(\alpha \pm \beta) = \cos \alpha \cdot \cos \beta \mp \sin \alpha \cdot \sin \beta$$

$$\operatorname{ctg}(\alpha \pm \beta) = \frac{\operatorname{ctg} \alpha \cdot \operatorname{ctg} \beta \mp 1}{\operatorname{ctg} \beta \pm \operatorname{ctg} \alpha}$$

$$\operatorname{tg}(\alpha \pm \beta) = \frac{\operatorname{tg} \alpha \pm \operatorname{tg} \beta}{1 \mp \operatorname{tg} \alpha \cdot \operatorname{tg} \beta}$$

$$\sin 2\alpha = 2 \sin \alpha \cdot \cos \alpha$$

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

$$\sin 3\alpha = 3 \sin \alpha - 4 \sin^3 \alpha$$

$$\cos 3\alpha = 4 \cos^3 \alpha - 3 \cos \alpha$$

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

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

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

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

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

$$\cos^2 \alpha = \frac{1 + \cos 2\alpha}{2}$$

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\arcsin(-x) = -\arcsin x \text{ (не парна)}$$

$$\arccos(-x) = \pi - \arccos x \text{ (ні парна, ні не п.)}$$

$$\operatorname{arctg}(-x) = -\operatorname{arctg} x \text{ (не парна)}$$

$$\operatorname{arcctg}(-x) = \pi - \operatorname{arcctg} x \text{ (ні парна, ні неп.)}$$

$$\sin x = a; |a| < 1$$

$$x = (-1)^n \arcsin a + \pi n, n \in \mathbb{Z}$$

$$\cos x = a; |a| < 1$$

$$x = \pm \arccos a + 2\pi n, n \in \mathbb{Z}$$

$$\operatorname{tg} x = a$$

$$x = \operatorname{arctg} a + \pi n, n \in \mathbb{Z}$$

$$\operatorname{ctg} x = a$$

$$x = \operatorname{arcctg} a + \pi n, n \in \mathbb{Z}$$

$$\operatorname{npv} |a| \leq 1$$

$$0 \leq \arccos a \leq \pi$$

$$\cos(\arccos a) = a$$

$$\operatorname{npv} |a| \leq 1$$

$$-\frac{\pi}{2} \leq \arcsin a \leq \frac{\pi}{2}$$

$$\sin(\arcsin a) = a$$

$$\operatorname{npv} \forall a$$

$$-\frac{\pi}{2} < \operatorname{arctg} a < \frac{\pi}{2}$$

$$\operatorname{tg}(\operatorname{arctg} a) = a$$

$$\operatorname{npv} \forall a$$

$$0 < \operatorname{arcctg} a < \pi$$

$$\operatorname{ctg}(\operatorname{arcctg} a) = a$$

$$\sin x = 0$$

$$x = \pi n, n \in \mathbb{Z}$$

$$\cos x = 0$$

$$x = \frac{\pi}{2} + \pi n, n \in \mathbb{Z}$$

$$\sin x = 1$$

$$x = \frac{\pi}{2} + 2\pi n, n \in \mathbb{Z}$$

$$\cos x = 1$$

$$x = 2\pi n, n \in \mathbb{Z}$$

$$\arcsin x = a$$

$$-\frac{\pi}{2} \leq a \leq \frac{\pi}{2}$$

$$x = \sin a$$

$$\arccos x = a$$

$$0 \leq a \leq \pi$$

$$x = \cos a$$

$$\operatorname{arctg} x = a$$

$$-\frac{\pi}{2} < a < \frac{\pi}{2}$$

$$x = \operatorname{tg} a$$

$$\operatorname{arcctg} x = a$$

$$0 \leq a \leq \pi$$

$$x = \operatorname{ctg} a$$