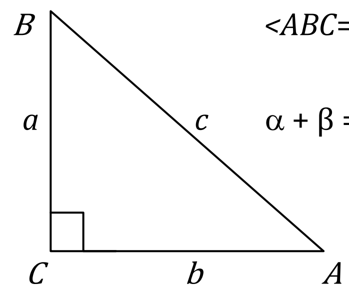
Trigonometrija

$\boxed{\sin\alpha = \dfrac{naspramna\ \ kateta}{hipotenuza} = \dfrac{a}{c}}$ $\left(\sin\alpha = \cos\beta = \cos(90°\text{-}\alpha)\right)$ $<CAB=\alpha$

$\boxed{\cos\alpha = \dfrac{nalegla\ \ kateta}{hipotenuza} = \dfrac{b}{c}}$ $\left(\cos\alpha = \sin\beta = \sin(90°\text{-}\alpha)\right)$ $<ABC=\beta$

$\boxed{\operatorname{tg}\alpha = \dfrac{naspramna\ \ kateta}{nalegla\ \ kateta} = \dfrac{a}{b}}$ $\left(\operatorname{tg}\alpha = \operatorname{ctg}\beta = \operatorname{ctg}(90°\text{-}\alpha)\right)$ $\alpha + \beta = 90°$

$\boxed{\operatorname{ctg}\alpha = \dfrac{nalegla\ \ kateta}{naspramna\ \ kateta} = \dfrac{b}{a}}$ $\left(\operatorname{ctg}\alpha = \operatorname{tg}\beta = \operatorname{tg}(90°\text{-}\alpha)\right)$



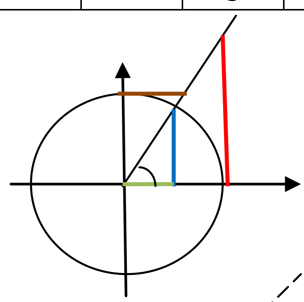
Osnovne trigonometrijske formule:

$\boxed{\sin^2\alpha + \cos^2\alpha = 1}$ $\boxed{\operatorname{tg}\alpha = \dfrac{\sin\alpha}{\cos\alpha}}$ $\boxed{\operatorname{ctg}\alpha = \dfrac{\cos\alpha}{\sin\alpha}}$ $\boxed{\operatorname{tg}\alpha\cdot\operatorname{ctg}\alpha = 1}$

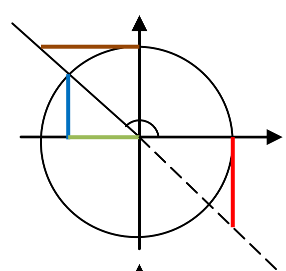
Vrednosti trigonometrijskih funkcija za neke važne uglove:

α (stepeni)	0°	30°	45°	60°	90°	120°	135°	150°	180°	270°	360°
α (radijani)	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	π	$\frac{3\pi}{2}$	2π
sinα	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	-1	0
cosα	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	$-\frac{1}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{3}}{2}$	-1	0	1
tgα	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	$\pm\infty$	$-\sqrt{3}$	-1	$-\frac{\sqrt{3}}{3}$	0	$\mp\infty$	0
ctgα	$\pm\infty$	$\sqrt{3}$	1	$\frac{\sqrt{3}}{3}$	0	$-\frac{\sqrt{3}}{3}$	-1	$-\sqrt{3}$	$\mp\infty$	0	$\pm\infty$

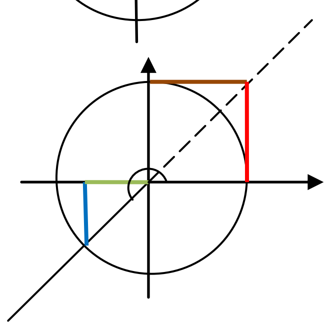
Prvi kvadrant:
sinα >0
cosα >0
tgα >0
ctgα >0



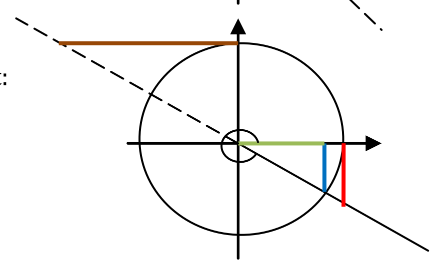
Drugi kvadrant:
sinα >0
cosα <0
tgα <0
ctgα <0



Treći kvadrant:
sinα <0
cosα <0
tgα >0
ctgα >0



Četvrti kvadrant:
sinα <0
cosα >0
tgα <0
ctgα <0



Parnost i neparnost trigonometrijskih funkcija:

$\boxed{\sin(-\alpha) = -\sin\alpha}$ $\boxed{\cos(-\alpha) = \cos\alpha}$ $\boxed{\mathrm{tg}(-\alpha) = -\mathrm{tg}\alpha}$ $\boxed{\mathrm{ctg}(-\alpha) = -\mathrm{ctg}\alpha}$

Periodičnost trigonometrijskih funkcija, $k \in Z$:

$\boxed{\sin(\alpha + 2k\pi) = \sin\alpha}$ $\boxed{\cos(\alpha + 2k\pi) = \cos\alpha}$ $\boxed{\mathrm{tg}(\alpha + k\pi) = \mathrm{tg}\alpha}$ $\boxed{\mathrm{ctg}(\alpha + k\pi) = \mathrm{ctg}\alpha}$

Izražavanje jedne trigonometrijske funkcije pomoću druge za uglove u prvom kvadrantu,

$0 < \alpha < \frac{\pi}{2}$:

$$\boxed{\sin\alpha = \sqrt{1-\cos^2\alpha} = \frac{\mathrm{tg}\,\alpha}{\sqrt{1+\mathrm{tg}^2\alpha}} = \frac{1}{\sqrt{1+\mathrm{ctg}^2\alpha}}}$$ $$\boxed{\cos\alpha = \sqrt{1-\sin^2\alpha} = \frac{1}{\sqrt{1+\mathrm{tg}^2\alpha}} = \frac{\mathrm{ctg}\,\alpha}{\sqrt{1+\mathrm{ctg}^2\alpha}}}$$

$$\boxed{\mathrm{tg}\,\alpha = \frac{\sin\alpha}{\sqrt{1-\sin^2\alpha}} = \frac{\sqrt{1-\cos^2\alpha}}{\cos\alpha} = \frac{1}{\mathrm{ctg}\,\alpha}}$$ $$\boxed{\mathrm{ctg}\,\alpha = \frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}} = \frac{\sqrt{1-\sin^2\alpha}}{\sin\alpha} = \frac{1}{\mathrm{tg}\,\alpha}}$$

Adicione formule:

$$\boxed{\sin(\alpha \pm \beta) = \sin\alpha\cos\beta \pm \cos\alpha\sin\beta}$$ $$\boxed{\cos(\alpha \pm \beta) = \cos\alpha\cos\beta \mp \sin\alpha\sin\beta}$$

$$\boxed{\mathrm{tg}(\alpha \pm \beta) = \frac{\mathrm{tg}\,\alpha \pm \mathrm{tg}\,\beta}{1 \mp \mathrm{tg}\,\alpha\,\mathrm{tg}\,\beta}}$$ $$\boxed{\mathrm{ctg}(\alpha \pm \beta) = \frac{\mathrm{ctg}\,\alpha\,\mathrm{ctg}\,\beta \mp 1}{\mathrm{ctg}\,\beta \pm \mathrm{ctg}\,\alpha}}$$

Trigonometrijski identiteti za dvostruki ugao:

$\boxed{\sin 2\alpha = 2\sin\alpha\cos\beta}$ $\boxed{\cos 2\alpha = \cos^2\alpha - \sin^2\alpha}$ $\boxed{\mathrm{tg}\,2\alpha = \frac{2\mathrm{tg}\,\alpha}{1-\mathrm{tg}^2\alpha}}$ $\boxed{\mathrm{ctg}\,2\alpha = \frac{\mathrm{ctg}^2\alpha - 1}{2\mathrm{ctg}\,\alpha}}$

Trigonometrijski identiteti za polovinu ugla:

$\boxed{\sin^2\frac{\alpha}{2} = \frac{1-\cos\alpha}{2}}$ $\boxed{\cos^2\frac{\alpha}{2} = \frac{1+\cos\alpha}{2}}$ $\boxed{\mathrm{tg}^2\frac{\alpha}{2} = \frac{1-\cos\alpha}{1+\cos\alpha}}$ $\boxed{\mathrm{ctg}^2\frac{\alpha}{2} = \frac{1+\cos\alpha}{1-\cos\alpha}}$

Zbir i razlika trigonometrijskih funkcija:

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

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

$$\boxed{\mathrm{tg}\,\alpha \pm \mathrm{tg}\beta = \frac{\sin(\alpha\pm\beta)}{\cos\alpha\cos\beta}}$$ $$\boxed{\mathrm{ctg}\,\beta \pm \mathrm{ctg}\alpha = \frac{\sin(\alpha\pm\beta)}{\sin\alpha\sin\beta}}$$ $$\boxed{\mathrm{ctg}\,\alpha \mp \mathrm{tg}\beta = \frac{\cos(\alpha\pm\beta)}{\sin\alpha\cos\beta}}$$

Proizvod trigonometrijskih funkcija:

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

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