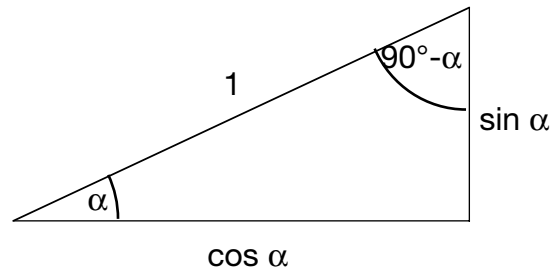


Formelsammlung zur Trigonometrie

Definition

$$\sin \alpha = \frac{\text{Gegenkathete von } \alpha}{\text{Hypotenuse}} \quad \cos \alpha = \frac{\text{Ankathete von } \alpha}{\text{Hypotenuse}} \quad \tan \alpha = \frac{\text{Gegenkathete von } \alpha}{\text{Ankathete von } \alpha}$$

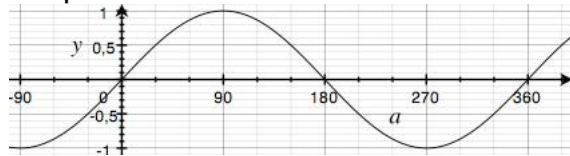
Merkdreieck



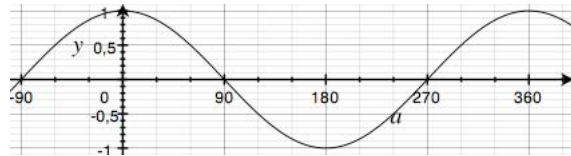
Zusammenhänge $\sin \alpha = \cos(90^\circ - \alpha)$ $\cos \alpha = \sin(90^\circ - \alpha)$ $\sin^2 \alpha + \cos^2 \alpha = 1$

$$\tan \alpha = \frac{\sin \alpha}{\cos \alpha}$$

Graphen



$\sin \alpha$



$\cos \alpha$

Besondere Werte

α	0°	30°	45°	60°	90°
$\sin \alpha$	$\frac{1}{2} \cdot \sqrt{0} = 0$	$\frac{1}{2} \cdot \sqrt{1} = \frac{1}{2}$	$\frac{1}{2} \cdot \sqrt{2}$	$\frac{1}{2} \cdot \sqrt{3}$	$\frac{1}{2} \cdot \sqrt{4} = 1$
$\cos \alpha$	$\frac{1}{2} \cdot \sqrt{4} = 1$	$\frac{1}{2} \cdot \sqrt{3}$	$\frac{1}{2} \cdot \sqrt{2}$	$\frac{1}{2} \cdot \sqrt{1} = \frac{1}{2}$	$\frac{1}{2} \cdot \sqrt{0} = 0$

Negative Winkel $\sin(-\alpha) = -\sin \alpha$ $\cos(-\alpha) = \cos \alpha$

Additionstheoreme

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

Formeln für doppelte Winkel (Additionstheoreme für $\alpha=\beta$)

$$\cos(2\alpha) = \cos^2 \alpha - \sin^2 \alpha = 2 \cdot \cos^2 \alpha - 1$$