

### Hodnoty goniometrických funkcí v některých důležitých bodech

$x [^\circ]$	0	30	45	60	90	120	135	150	180	210	225	240	270	300	315	330	360
$x [\text{rad}]$	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	$\pi$	$\frac{7\pi}{6}$	$\frac{5\pi}{4}$	$\frac{4\pi}{3}$	$\frac{3\pi}{2}$	$\frac{5\pi}{3}$	$\frac{7\pi}{4}$	$\frac{11\pi}{6}$	$2\pi$
$\sin x$	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	$-\frac{1}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{3}}{2}$	-1	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{1}{2}$	0
$\cos x$	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	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{1}{2}$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
$\text{tg } x$	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	nedef.	$-\sqrt{3}$	-1	$-\frac{\sqrt{3}}{3}$	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	nedef.	$-\sqrt{3}$	-1	$-\frac{\sqrt{3}}{3}$	0
$\text{cotg } x$	nedef.	$\sqrt{3}$	1	$\frac{\sqrt{3}}{3}$	0	$-\frac{\sqrt{3}}{3}$	-1	$-\sqrt{3}$	nedef.	$\sqrt{3}$	1	$\frac{\sqrt{3}}{3}$	0	$-\frac{\sqrt{3}}{3}$	-1	$-\sqrt{3}$	nedef.

### Základní vztahy mezi goniometrickými funkcemi

$$\sin^2 x + \cos^2 x = 1, \quad \text{tg } x \text{ cotg } x = 1,$$

$$\sin 2x = 2 \sin x \cos x,$$

$$\cos 2x = \cos^2 x - \sin^2 x = 1 - 2 \sin^2 x = 2 \cos^2 x - 1,$$

$$\sin^2 \frac{x}{2} = \frac{1 - \cos x}{2}, \quad \cos^2 \frac{x}{2} = \frac{1 + \cos x}{2},$$

$$\sin(x + y) = \sin x \cos y + \cos x \sin y,$$

$$\sin(x - y) = \sin x \cos y - \cos x \sin y,$$

$$\cos(x + y) = \cos x \cos y - \sin x \sin y,$$

$$\cos(x - y) = \cos x \cos y + \sin x \sin y,$$

$$\sin x + \sin y = 2 \sin \frac{x + y}{2} \cos \frac{x - y}{2},$$

$$\sin x - \sin y = 2 \sin \frac{x - y}{2} \cos \frac{x + y}{2},$$

$$\cos x + \cos y = 2 \cos \frac{x + y}{2} \cos \frac{x - y}{2},$$

$$\cos x - \cos y = -2 \sin \frac{x + y}{2} \sin \frac{x - y}{2},$$

$$\text{tg}(x + y) = \frac{\text{tg } x + \text{tg } y}{1 - \text{tg } x \text{tg } y}, \quad \text{tg}(x - y) = \frac{\text{tg } x - \text{tg } y}{1 + \text{tg } x \text{tg } y},$$

$$\sin x = \frac{2 \text{tg } \frac{x}{2}}{1 + \text{tg}^2 \frac{x}{2}}, \quad \cos x = \frac{1 - \text{tg}^2 \frac{x}{2}}{1 + \text{tg}^2 \frac{x}{2}}, \quad \text{tg } x = \frac{2 \text{tg } \frac{x}{2}}{1 - \text{tg}^2 \frac{x}{2}}.$$