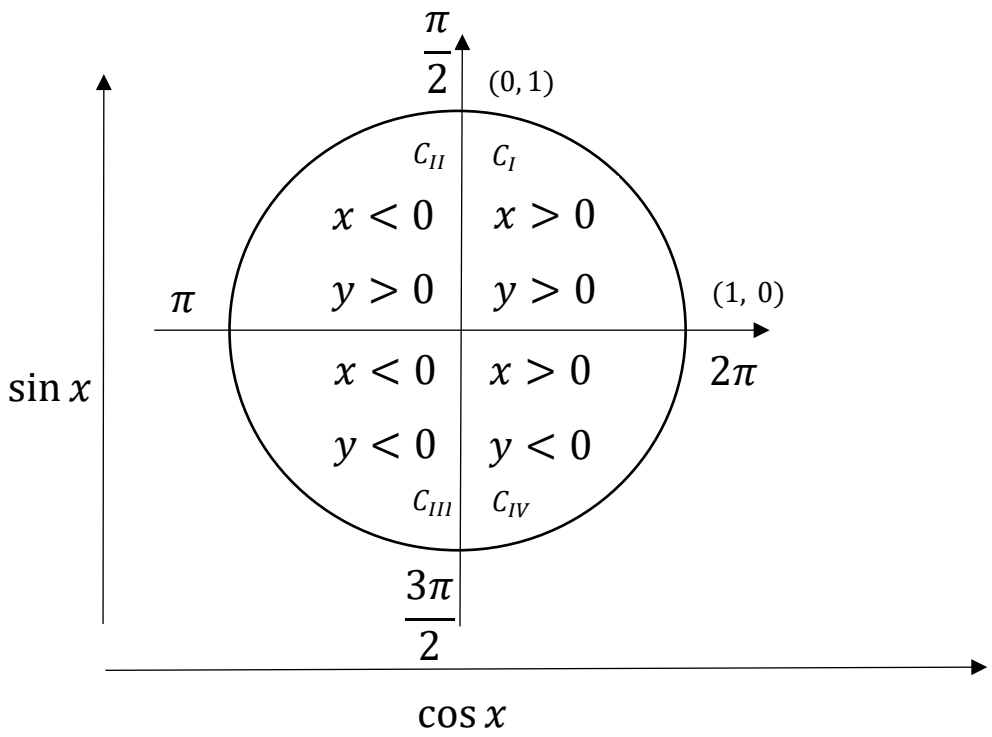
Trigonometrie

x	0°	30°	45°	60°	90°	180°	270°	360°
x	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
$\sin x$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1	0	-1	0
$\cos x$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	-1	0	1
$\operatorname{tg} x$	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	$-$	0	$-$	1
$\operatorname{ctg} x$	$-$	$\sqrt{3}$	1	$\frac{\sqrt{3}}{3}$	0	$-$	0	$-$



Schimbare de cadran:

$$C_{II} \to C_I : \frac{\pi}{2} < t_0 < \pi \Rightarrow \quad \cos t_0 = -\cos(\pi - t_0)$$

$$\sin t_0 = \sin(\pi - t_0)$$

$$C_{III} \to C_I : \pi < t_0 < \frac{3\pi}{2} \Rightarrow \quad \cos t_0 = -\cos(t_0 - \pi)$$

$$\sin t_0 = -\sin(t_0 - \pi)$$

$$C_{IV} \to C_I : \frac{3\pi}{2} < t_0 < 2\pi \Rightarrow \cos t_0 = \cos(2\pi - t_0)$$

$$\sin t_0 = -\sin(2\pi - t_0)$$

Formule:

$$\sin^2 x + \cos^2 x = 1 \Rightarrow \sin x = \pm\sqrt{1 - \cos^2 x}$$

$$\cos x = \pm\sqrt{1 - \sin^2 x}$$

$$\operatorname{tg} x * \operatorname{ctg} x = 1$$

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

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

$$\sin 2x = 2 \sin x \cos x \qquad \cos 2x = \cos^2 x - \sin^2 x$$

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

$$\sin 3x = \sin x\,(3 - 4\sin^2 x) \qquad \cos 3x = \cos x\,(4\cos^2 x - 3)$$

$$\sin\frac{x}{2} = \pm\sqrt{\frac{1 - \cos x}{2}} \qquad \cos\frac{x}{2} = \pm\sqrt{\frac{1 + \cos x}{2}}$$

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

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

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

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

$$\operatorname{tg}(x+y) = \frac{\operatorname{tg} x + \operatorname{tg} y}{1 - \operatorname{tg} x \operatorname{tg} y} \qquad \operatorname{tg}(x+y) = \frac{\operatorname{tg} x - \operatorname{tg} y}{1 + \operatorname{tg} x \operatorname{tg} y}$$

$$\operatorname{tg} 2x = \frac{2 \operatorname{tg} x}{1 - \operatorname{tg}^2 x} \qquad \operatorname{tg} 3x = \frac{3 \operatorname{tg} x - \operatorname{tg}^3 x}{1 - 3\operatorname{tg}^2 x}$$

$$\operatorname{tg} x \operatorname{tg} y = \frac{\cos(x-y) - \cos(x+y)}{\cos(x-y) + \cos(x+y)}$$

$$\operatorname{tg}\frac{x}{2} = \pm\sqrt{\frac{1-\cos x}{1+\cos x}} \qquad \operatorname{tg}\frac{x}{2} = \frac{\sin x}{1+\cos x}$$

$$\operatorname{tg} x + \operatorname{tg} y = \frac{\sin(x+y)}{\cos x \cos y} = \operatorname{tg}(x+y)\,(1 - \operatorname{tg} x \operatorname{tg} y)$$

$$\operatorname{tg} x - \operatorname{tg} y = \frac{\sin(x-y)}{\cos x \cos y} = \operatorname{tg}(x-y)\,(1 + \operatorname{tg} x \operatorname{tg} y)$$