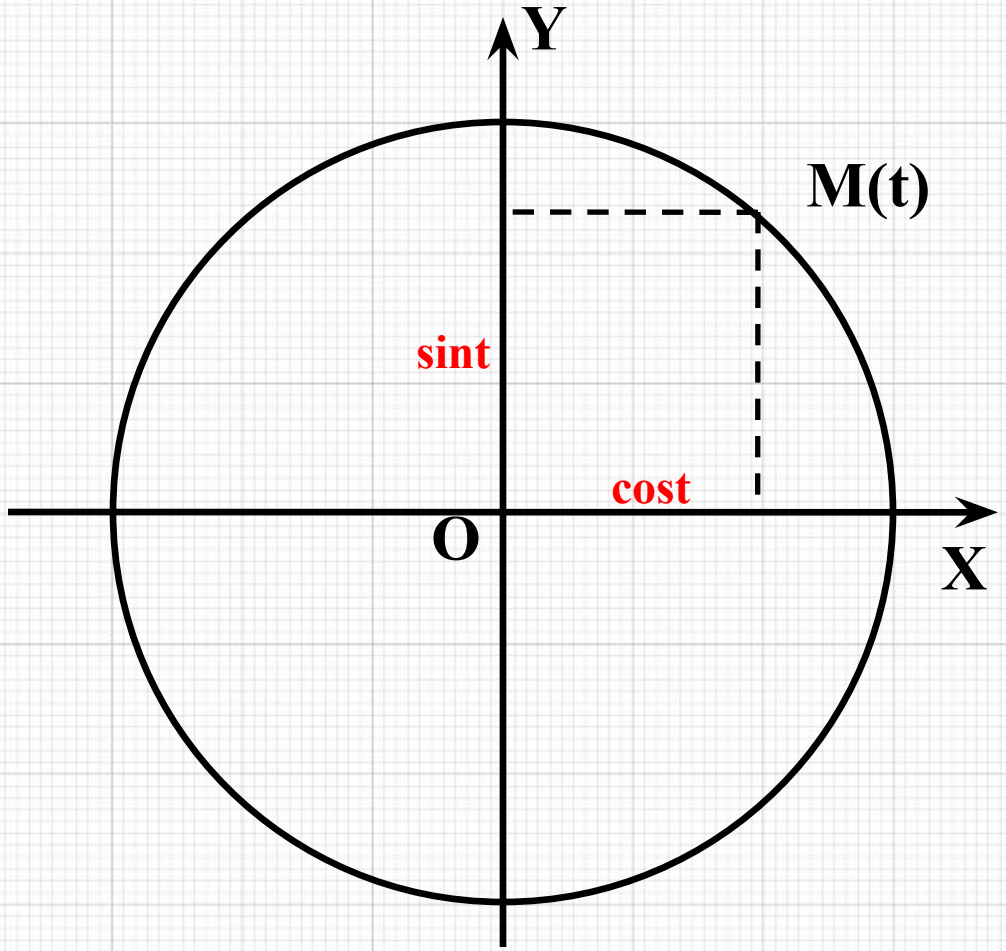
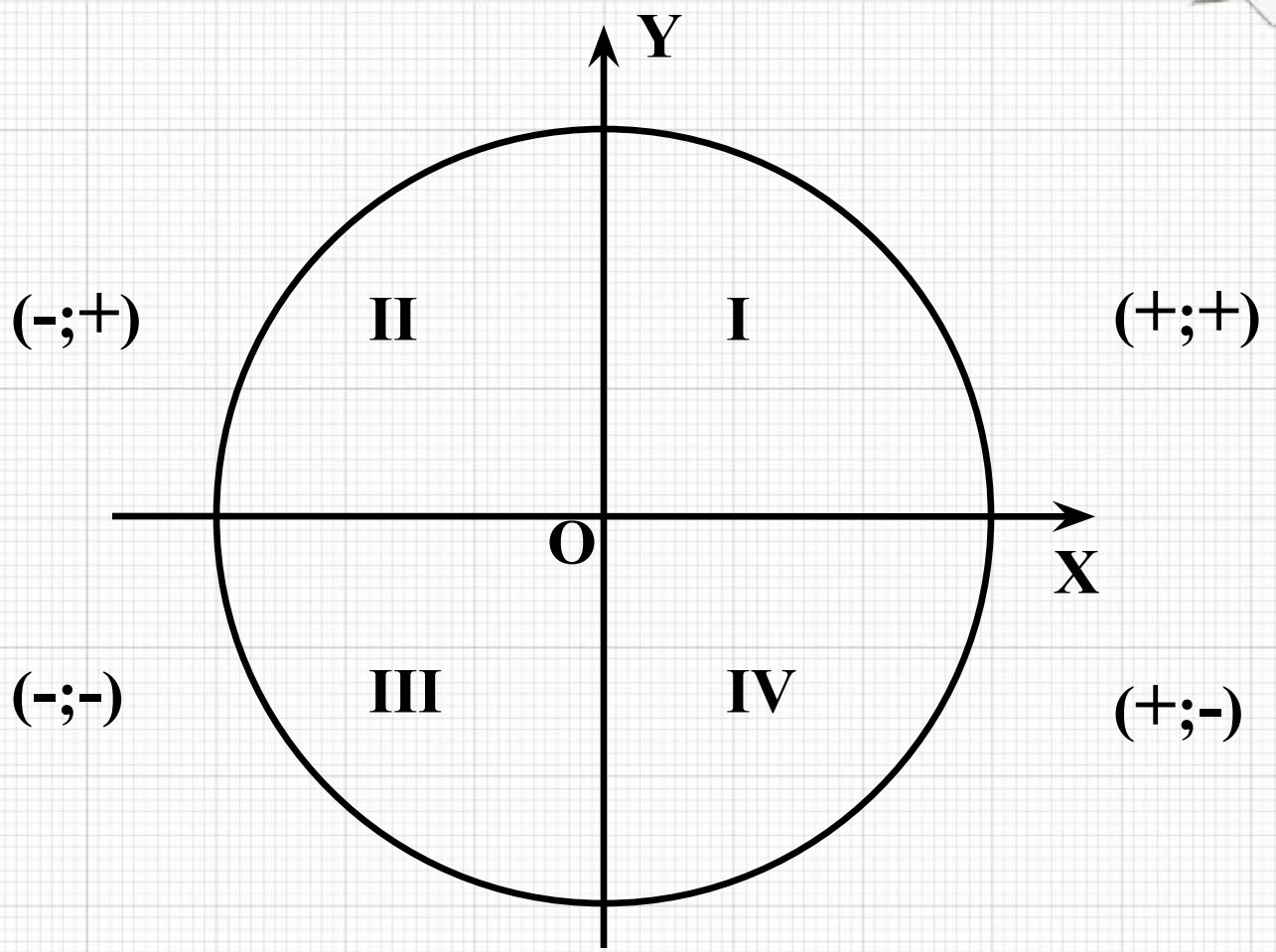
Тригонометрические функции

Синус и косинус



если M(t) = M(x;y), то

x = cost, y = sint



$$-1 \le x \le 1;\ -1 \le y \le 1$$

$$-1 \le \sin t \le 1, -1 \le \cos t \le 1$$

Таблица знаков синуса и косинуса

	I четверть	II четверть	III четверть	IV четверть
cost	+	-	-	+
sint	+	+	-	-

$$x^2 + y^2 = R^2$$

при R = 1

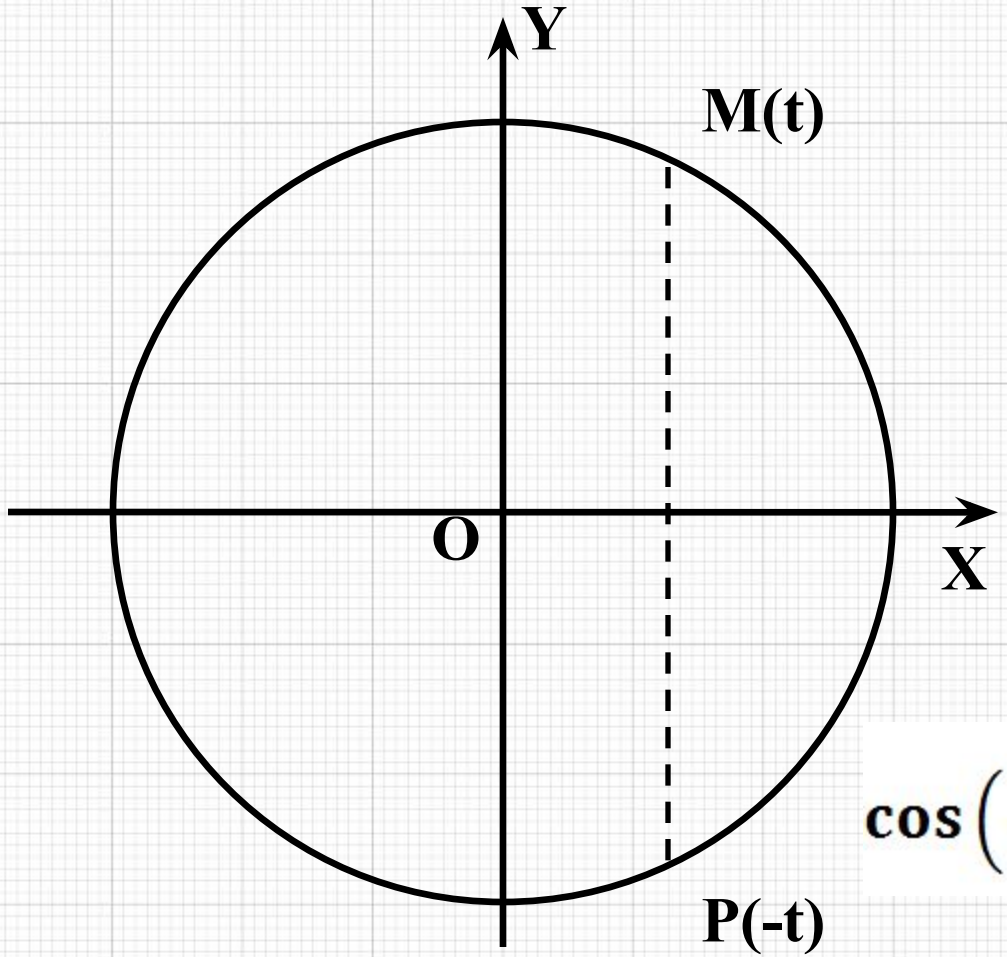
$$x^2 + y^2 = 1$$

– уравнение единичной окружности

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

Таблица значений синуса и косинуса

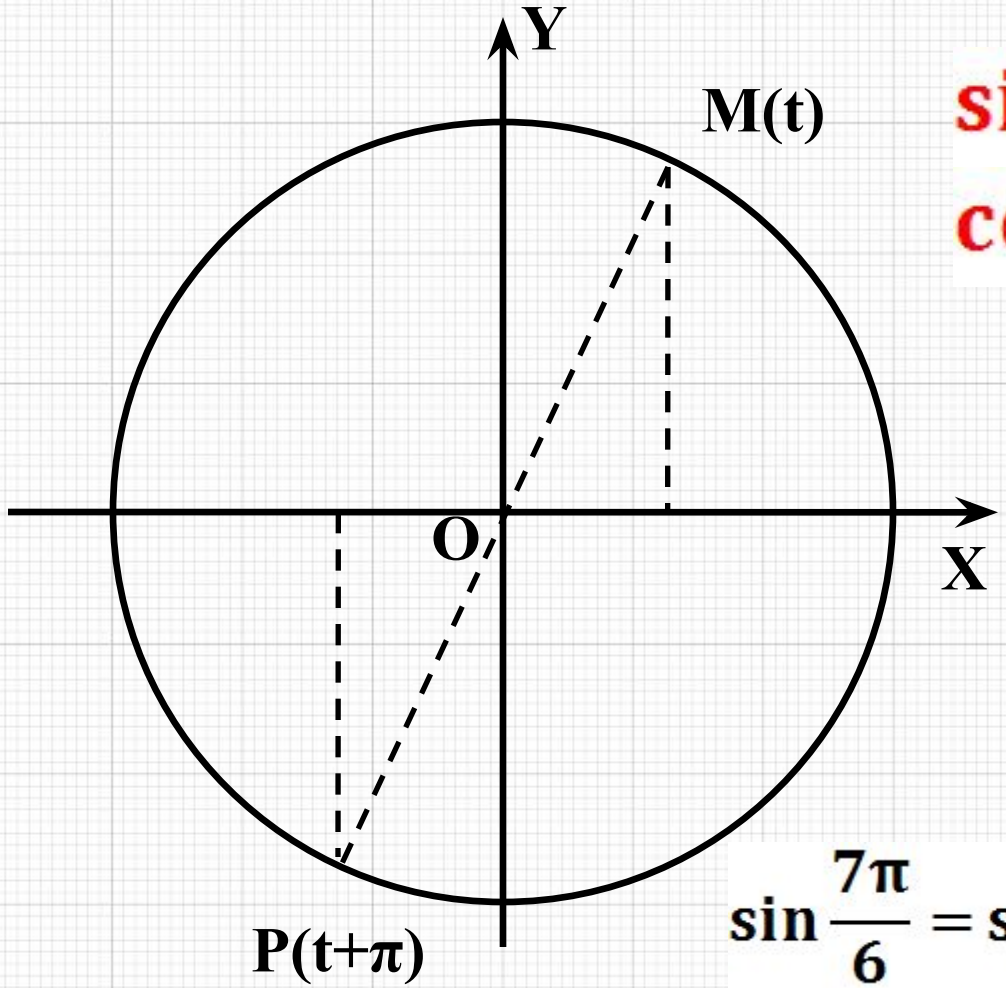
t	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
cost	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
sint	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1



$$\sin(-t) = -\sin t$$

$$\cos(-t) = \cos t$$

$$\cos\left(-\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}, \sin\left(-\frac{\pi}{6}\right) = -\frac{1}{2}$$

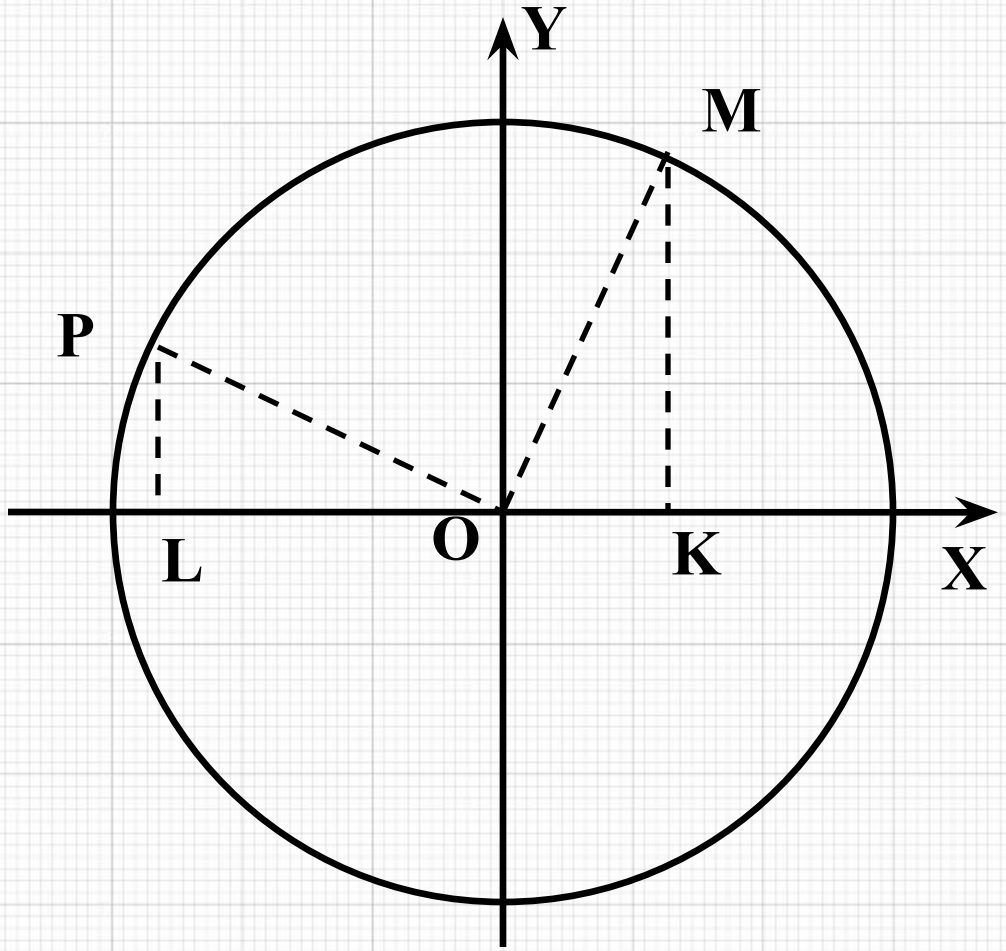


$$\sin(t+\pi) = -\sin t$$

$$\cos(t+\pi) = -\cos t$$

$$\sin\frac{7\pi}{6} = \sin\left(\frac{\pi}{6}+\pi\right) = -\sin\frac{\pi}{6} = -\frac{1}{2}$$

$$\cos\frac{5\pi}{4} = \cos\left(\frac{\pi}{4}+\pi\right) = -\cos\frac{\pi}{4} = -\frac{\sqrt{2}}{2}$$



$$\sin\left(t+\frac{\pi}{2}\right)=\cos t$$

$$\cos\left(t+\frac{\pi}{2}\right)=-\sin t$$

Вычислить Sint и Cost, если:

$$t = \frac{45\pi}{4}; t = -\frac{37\pi}{3}; t = 45\pi; t = -18$$

$$\frac{45\pi}{4} = \frac{45}{4} \cdot \pi = \left(10 + \frac{5}{4}\right) \cdot \pi = 10\pi + \frac{5\pi}{4} = \frac{5\pi}{4} + 2\pi \cdot 5$$

$$\sin\frac{45\pi}{4} = \sin\frac{5\pi}{4} = -\frac{\sqrt{2}}{2} \qquad \cos\frac{45\pi}{4} = \cos\frac{5\pi}{4} = -\frac{\sqrt{2}}{2}$$

$$-\frac{37\pi}{3} = -\frac{37}{3} \cdot \pi = -\left(12 + \frac{1}{3}\right) \cdot \pi = -12\pi - \frac{\pi}{3} = -\frac{\pi}{3} + 2\pi \cdot (-6)$$

$$\sin(-\frac{37\pi}{3}) = \sin(-\frac{\pi}{3}) = \sin\frac{5\pi}{3} = -\frac{\sqrt{3}}{2}$$

$$\cos(-\frac{37\pi}{3}) = \cos(-\frac{\pi}{3}) = \cos\frac{5\pi}{3} = \frac{1}{2}$$

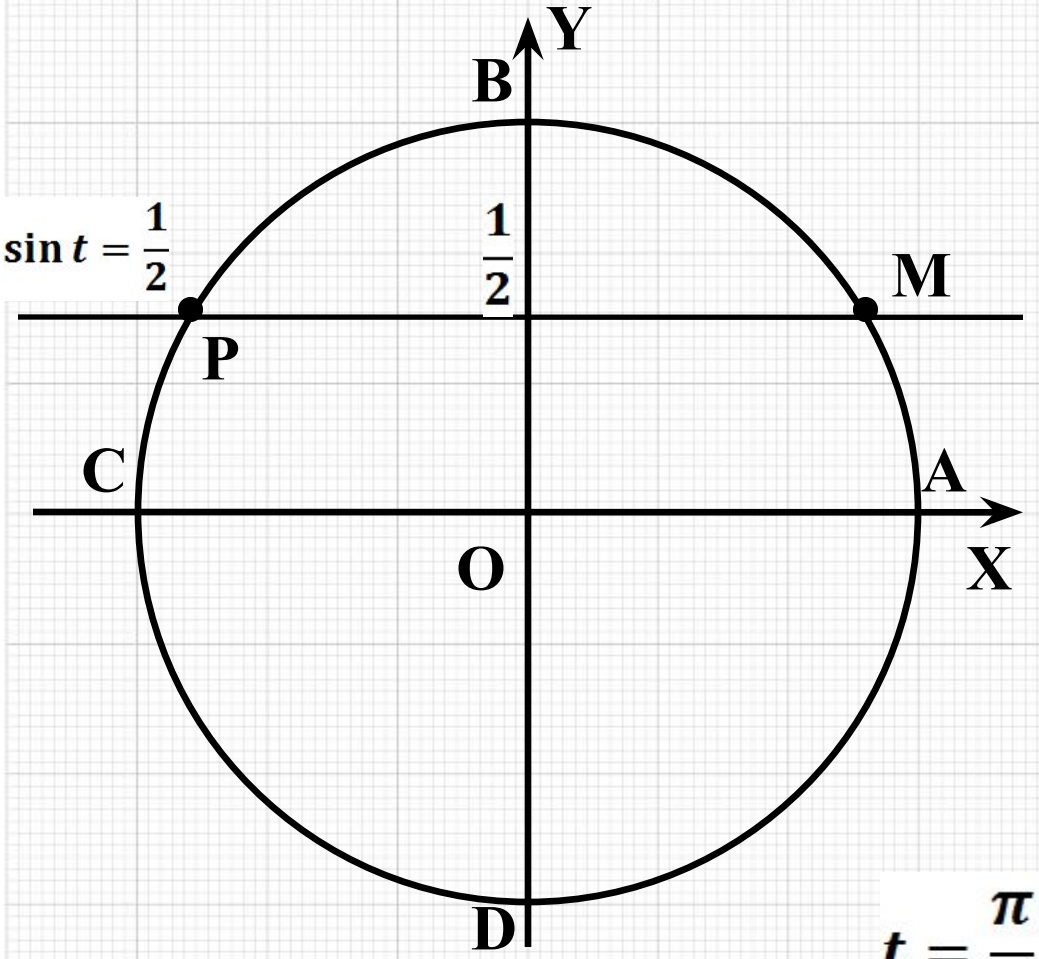
$$45\pi = 44\pi + \pi = \pi + 2\pi \cdot 22$$

$$\sin 45\pi = \sin \pi = 0; \cos 45\pi = \cos \pi = -1$$

$$-18\pi = 0 + 2\pi \cdot (-9)$$

$$\sin(-18\pi) = \sin 0 = 0; \cos(-18\pi) = \cos 0 = 1$$

Решить уравнение $\sin t = \frac{1}{2}$



$$t = \frac{\pi}{6} + 2\pi k; t = \frac{5\pi}{6} + 2\pi k; k \epsilon Z$$