

# **Преобразование тригонометрических выражений**

## **(вывод тригонометрических формул)**

# I-b. Формулы приведения

$\alpha$	$\pi / 2 - \alpha$	$\pi / 2 + \alpha$	$\pi - \alpha$	$\pi + \alpha$	$3\pi / 2 - \alpha$	$3\pi / 2 + \alpha$	$2\pi - \alpha$	$2\pi + \alpha$
<b>sin</b>	$\cos \alpha$	$\cos \alpha$	$\sin \alpha$	$-\sin \alpha$	$-\cos \alpha$	$-\cos \alpha$	$-\sin \alpha$	$\sin \alpha$
<b>cos</b>	$-\sin \alpha$	$-\sin \alpha$	$-\cos \alpha$	$-\cos \alpha$	$-\sin \alpha$	$\sin \alpha$	$\cos \alpha$	$\cos \alpha$
<b>tg</b>	$\operatorname{ctg} \alpha$	$-\operatorname{ctg} \alpha$	$-\operatorname{tg} \alpha$	$\operatorname{tg} \alpha$	$\operatorname{ctg} \alpha$	$-\operatorname{ctg} \alpha$	$-\operatorname{tg} \alpha$	$\operatorname{tg} \alpha$
<b>ctg</b>	$\operatorname{tg} \alpha$	$-\operatorname{tg} \alpha$	$-\operatorname{ctg} \alpha$	$\operatorname{ctg} \alpha$	$\operatorname{tg} \alpha$	$-\operatorname{tg} \alpha$	$-\operatorname{ctg} \alpha$	$\operatorname{ctg} \alpha$

$$1) \quad \operatorname{tg} \frac{5\pi}{4} = \operatorname{tg} \left( \pi + \frac{\pi}{4} \right) = \operatorname{tg} \frac{\pi}{4} = 1; \quad 2) \quad \sin \frac{7\pi}{6} = \sin \left( \pi + \frac{\pi}{6} \right) = -\sin \frac{\pi}{6} = -\frac{1}{2};$$

$$3) \quad \cos \frac{5\pi}{3} = \cos \left( 2\pi - \frac{\pi}{3} \right) = \cos \frac{\pi}{3} = \frac{1}{2}; \quad 4) \quad \operatorname{ctg} \frac{5\pi}{3} = \operatorname{ctg} \left( 2\pi - \frac{\pi}{3} \right) = -\operatorname{ctg} \frac{\pi}{3} = -\frac{1}{\sqrt{3}};$$

$$5) \quad \sin \left( -\frac{13\pi}{6} \right) = \sin \left( -2\pi - \frac{\pi}{6} \right) = -\sin \frac{\pi}{6} = -\frac{1}{2};$$

$$6) \quad \cos \left( -\frac{7\pi}{3} \right) = \cos \left( -2\pi - \frac{\pi}{3} \right) = \cos \frac{\pi}{3} = \frac{1}{2};$$

$$7) \quad \operatorname{tg} \left( -\frac{2\pi}{3} \right) = \operatorname{tg} \left( -\pi + \frac{\pi}{3} \right) = \operatorname{tg} \frac{\pi}{3} = \sqrt{3};$$

$$8) \quad \operatorname{ctg} \left( -\frac{7\pi}{4} \right) = \operatorname{ctg} \left( -2\pi + \frac{\pi}{4} \right) = \operatorname{ctg} \frac{\pi}{4} = 1.$$

Практические примеры:

$$\sin 150^\circ = \sin(180^\circ - 30^\circ) = \sin 30^\circ = 0,5$$

$$\sin 300^\circ = \sin(270^\circ + 30^\circ) = -\cos 30^\circ = -\frac{\sqrt{3}}{2}$$

$$\cos 225^\circ = \cos(180^\circ + 45^\circ) = -\cos 45^\circ = -\frac{\sqrt{2}}{2}$$

$$\operatorname{tg} 315^\circ = \operatorname{tg}(270^\circ + 45^\circ) = -\operatorname{ctg} 45^\circ = -1$$

$$\operatorname{ctg} 330^\circ = \operatorname{ctg}(360^\circ - 30^\circ) = -\operatorname{ctg} 30^\circ = -\sqrt{3}$$

## **Домашнее задание на тему «Формулы приведения»**

Упростить с помощью формул приведения:

$$1) \sin\left(\frac{\pi}{2} + \alpha\right) =$$

$$2) \cos(\pi - \alpha) =$$

$$3) \tg\left(\frac{3\pi}{2} + \alpha\right) =$$

$$4) \ctg(2\pi + \alpha) =$$

$$5) \sin(\pi + \alpha) =$$

$$6) \cos\left(\frac{3\pi}{2} + \alpha\right) =$$

$$7) \tg(2\pi - \alpha) =$$

$$8) \ctg\left(\frac{\pi}{2} - \alpha\right) =$$

Вычислите:

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

$$\sin^2(\pi + t) + \cos^2(\pi - t) :$$