

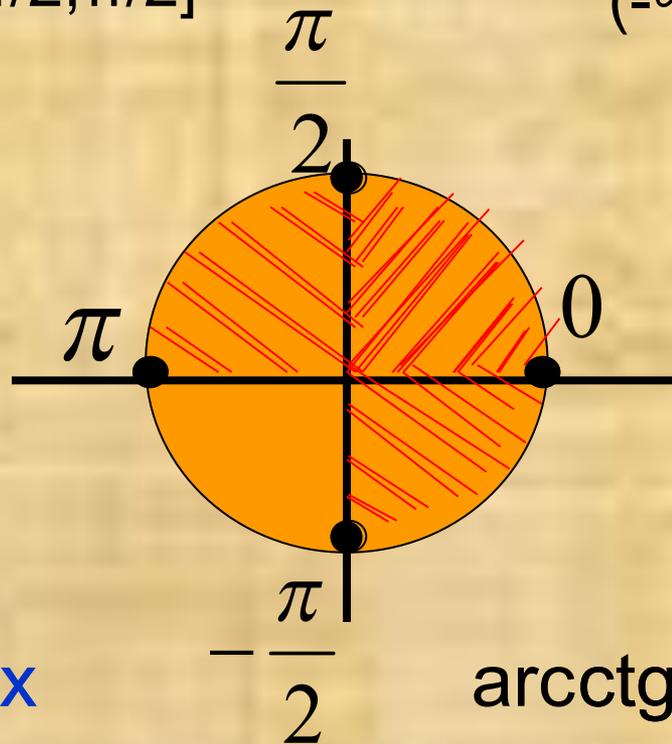


$$\arcsin a = x$$

$$[-1; 1] \quad [-\pi/2; \pi/2]$$

$$\operatorname{arctg} a = x$$

$$(-\infty; +\infty) \quad (-\pi/2; \pi/2)$$



$$\arccos a = x$$

$$[-1; 1] \quad [0; \pi]$$

$$\operatorname{arcctg} a = x$$

$$(-\infty; +\infty) \quad (0; \pi)$$

**Вычислите:**

$$\arcsin \frac{\sqrt{3}}{2}$$

$$\arccos \left( -\frac{\sqrt{3}}{2} \right)$$

$$\operatorname{arctg} \frac{\sqrt{3}}{3}$$

$$\arcsin \frac{\sqrt{2}}{2}$$

$$\operatorname{arcctg} \left( -\sqrt{3} \right)$$


# Найдите ошибку

$$\arcsin(-1) = \frac{3\pi}{2}$$

$$\arccos\left(-\frac{\sqrt{2}}{2}\right) = -\frac{\pi}{4}$$

$$\operatorname{arctg} \sqrt{3} = \frac{\pi}{6}$$

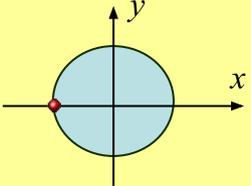
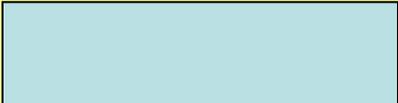
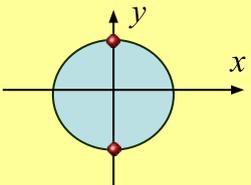
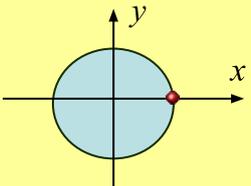
$$\arcsin\left(-\frac{1}{2}\right) = \frac{5\pi}{6}$$

$$\operatorname{arcctg}\left(-\frac{\sqrt{3}}{3}\right) = -\frac{\pi}{3}$$

## $\cos x = a$

1.  $a > 1$  или  $a < -1$  уравнение корней не имеет

2. Частные случаи:

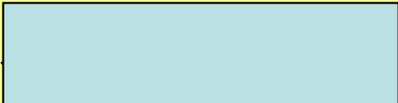
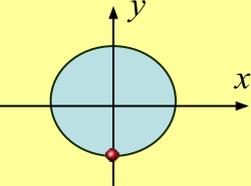
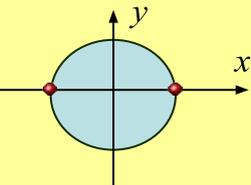
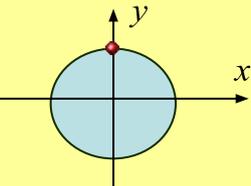
$\cos x = -1$ 	
$\cos x = 0$ 	
$\cos x = 1$ 	

3.  $x = \pm \arccos a + 2\pi k, k \in \mathbb{Z}$

## $\sin x = a$

1.  $a > 1$  или  $a < -1$  уравнение корней не имеет

2. Частные случаи:

$\sin x = -1$ 	
$\sin x = 0$ 	
$\sin x = 1$ 	

3.  $x = (-1)^k \cdot \arcsin a + \pi k, k \in \mathbb{Z}$

$$\begin{cases} x = \arcsin a + 2\pi n, \\ x = \pi - \arcsin a + 2\pi n, \end{cases} n \in \mathbb{Z}$$

Решите уравнение:

1).  $2 \sin x = 1$

$$x = (-1)^k \frac{\pi}{6} + \pi k \quad k \in \mathbb{Z}$$

2).  $-\sqrt{2} \cos x = 1$

$$x = \pm \frac{3\pi}{4} + 2\pi n \quad n \in \mathbb{Z}$$

3).  $2 \sin x = -\sqrt{3}$

$$x = (-1)^{k+1} \frac{\pi}{3} + \pi k \quad k \in \mathbb{Z}$$

4).  $\cos x = \sqrt{3}$

уравнение корней не имеет

5).  $\sin x = -0.1$

$$x = (-1)^{k+1} \arcsin 0.1 + \pi k \quad k \in \mathbb{Z}$$

$$6). \cos\left(x + \frac{\pi}{3}\right) = \frac{1}{2}$$

$$6) \cos(x + \pi/3) = 1/2$$

$$x + \pi/3 = \pm \arccos 1/2 + 2\pi k, k \in \mathbb{Z}$$

$$x + \pi/3 = \pm \pi/3 + 2\pi k, k \in \mathbb{Z}$$

$$x = -\pi/3 \pm \pi/3 + 2\pi k, k \in \mathbb{Z}$$

$$\text{ОТВЕТ: } -\pi/3 \pm \pi/3 + 2\pi k, k \in \mathbb{Z}$$

$$7). \sin\left(\pi - \frac{x}{3}\right) = 0$$

$$3) \sin(\pi - x/3) = 0$$

упростим по формулам приведения

$$\sin(x/3) = 0$$

частный случай

$$x/3 = \pi k, k \in \mathbb{Z}$$

$$x = 3\pi k, k \in \mathbb{Z}.$$

Ответ:  $3\pi k, k \in \mathbb{Z}$ .

## Пример.

Решите уравнение  $2 \cos\left(\frac{\pi}{4} - x\right) + \sqrt{3} = 0$

Решение.  $2 \cos\left(\frac{\pi}{4} - x\right) = -\sqrt{3}, \quad \cos\left(\frac{\pi}{4} - x\right) = -\frac{\sqrt{3}}{2}$

Учитывая четность косинуса, получим

$$\cos\left(x - \frac{\pi}{4}\right) = -\frac{\sqrt{3}}{2} \quad \text{Следовательно,}$$

$$\text{или } \frac{\pi}{4} - x = \pm \arccos\left(\frac{\sqrt{3}}{2}\right) + 2\pi k, \quad k \in \mathbb{Z} \quad -\frac{\pi}{4} = \pm \frac{5\pi}{6} + 2\pi k, \quad k \in \mathbb{Z}$$

$$x = \frac{\pi}{4} \pm \frac{5\pi}{6} + 2\pi k, \quad k \in \mathbb{Z}$$

**Ответ:**  $x = \frac{\pi}{4} \pm \frac{5\pi}{6} + 2\pi k, \quad k \in \mathbb{Z}$

## 1 вариант

$$\sqrt{2} \cos 4x - 1 = 0$$

$$\cos\left(\frac{\pi}{3} - 3x\right) = \frac{1}{2}$$

$$-2 \cos x = 0$$

$$-\sqrt{3} \operatorname{ctg} \frac{x}{4} = 3$$

## 2 вариант

$$\cos\left(2x - \frac{\pi}{2}\right) = \frac{\sqrt{2}}{2}$$

$$\sin\left(4x + \frac{3\pi}{2}\right) = 0$$

$$\cos(-x) = -1$$

$$\sqrt{3} \operatorname{tg} \frac{x}{2} = 1$$