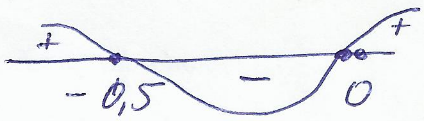
task 11822624

$\cos^2 x - 0{,}5\sin x > 1$

$1 - \cos^2 x + 0{,}5\sin x < 0 \Rightarrow \quad \sin^2 x + 0{,}5\sin x < 0 \Rightarrow$

$\sin x(\sin x + 0{,}5) < 0$



$-0{,}5 < \sin x < 0$

$(-1)^{k+1}\frac{\pi}{6} + \pi k < x < \pi k \qquad k \in Z$

Пользуясь случаем, даю вывод формулы

$\cos x \pm \sin x$

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

$= 2\cos\frac{\pi}{4}\cdot\cos\left(x - \frac{\pi}{4}\right) = 2\cdot\frac{\sqrt{2}}{2}\cdot\cos\left(x - \frac{\pi}{4}\right) = \sqrt{2}\cos\left(\frac{\pi}{4} - x\right)$, т.к

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

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

$= 2\cos\left(\frac{\pi}{4} + x\right)\cdot\sin\frac{\pi}{4} = \sqrt{2}\cos\left(\frac{\pi}{4} + x\right)$

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

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

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

$= 2\cos\frac{\pi}{4}\sin\left(\frac{\pi}{4} - x\right)$

Объединим 1) и 2)

$\cos x \pm \sin x = \sqrt{2}\cos\left(\frac{\pi}{4} \mp x\right)$

Объединим 3) и 4)

$\cos x \pm \sin x = \sqrt{2}\sin\left(\frac{\pi}{4} \pm x\right)$

Теперь понятно?