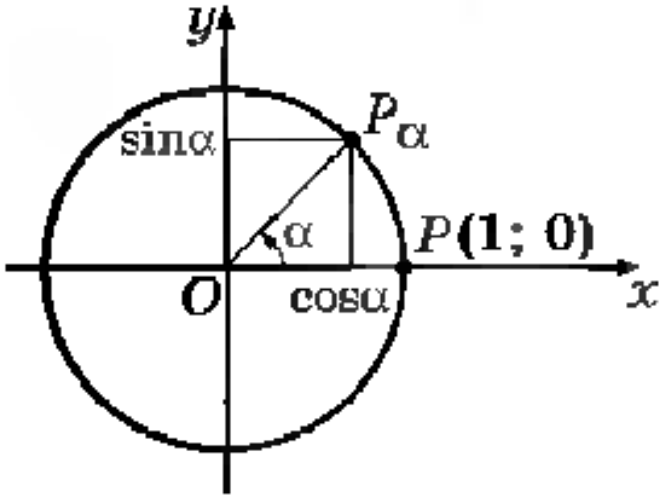
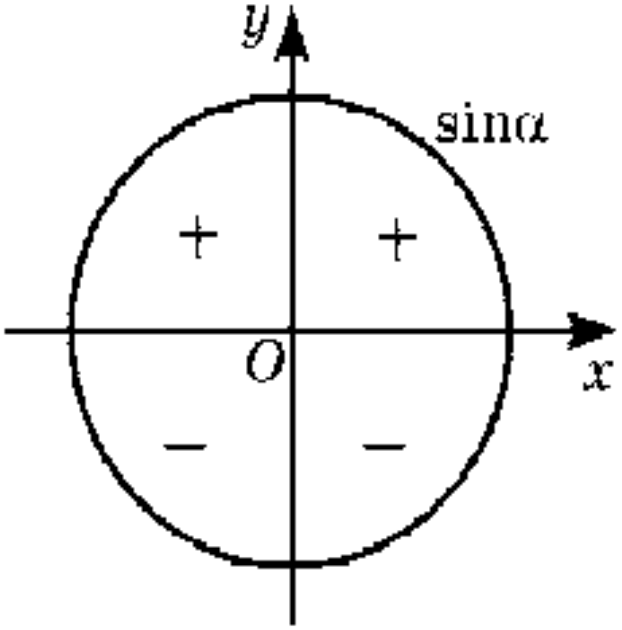
Ixtiyoriy argumentning trigonometrik funksiyalari. Sinus, kosinus, tangens va kotangens chiziqlari.

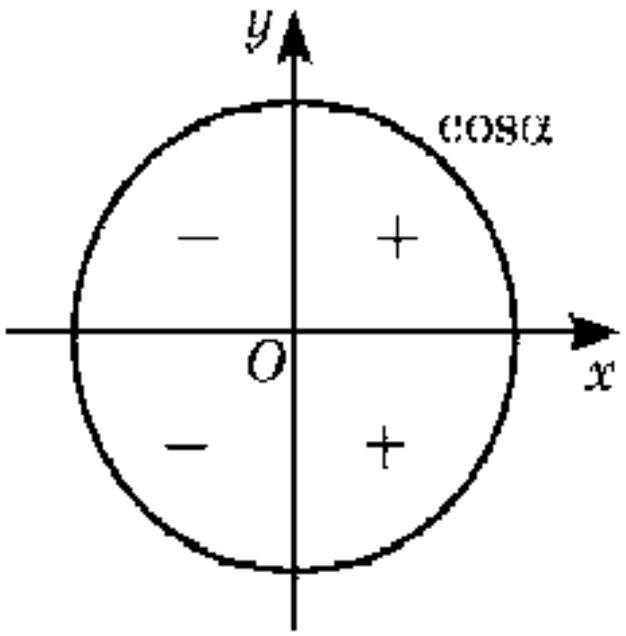
1-ta'rif. α ***burchakning sinusi deb (1; 0) nuqtani koordinatalar boshi atrofida*** α ***burchakka burish natijasida hosil bo'lgan nuqtaning ordinatasiga aytiladi*** **($\sin\alpha$ kabi belgilanadi).**

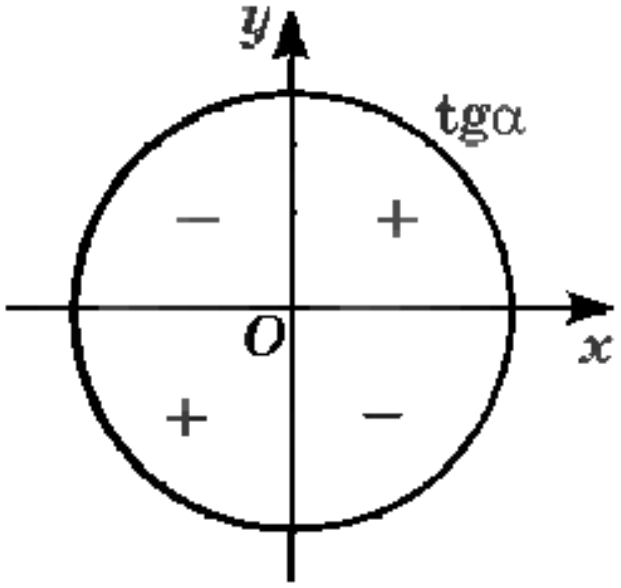


2-ta'rif. α ***burchakning kosinusi deb (1; 0) nuqtani koordinatalar boshi atrofida*** α ***burchakka burish natijasida hosil bo'lgan nuqtaning abssissasiga aytiladi*** **($\cos\alpha$ kabi belgilanadi).**

α	0 $(0°)$	$\frac{\pi}{6}$ $(30°)$	$\frac{\pi}{4}$ $(45°)$	$\frac{\pi}{3}$ $(60°)$	$\frac{\pi}{2}$ $(90°)$	π $(180°)$	$\frac{3}{2}\pi$ $(270°)$	2π $(360°)$
$\sin\alpha$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1	0	-1	0
$\cos\alpha$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	-1	0	1
$\mathrm{tg}\alpha$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	Mavjud emas	0	Mavjud emas	0
$\mathrm{ctg}\alpha$	Mavjud emas	$\sqrt{3}$	1	$\frac{1}{\sqrt{3}}$	0	Mavjud emas	0	Mavjud emas


y
sinα
+
+
O
x
−
−


y
cosα
−
+
O
x
−
+


y
tgα
−
+
O
x
+
−

278. Agar:

1) $\sin\alpha = \frac{1}{2}$; 2) $\sin\alpha = -\frac{\sqrt{2}}{2}$; 3) $\cos\alpha = \frac{\sqrt{2}}{2}$;

4) $\cos\alpha = -\frac{1}{2}$; 5) $\sin\alpha = -0{,}6$; 6) $\cos\alpha = \frac{1}{3}$

bo'lsa, birlik aylanada α burchakka mos keluvchi nuqtani tasvirlang.

Hisoblang **(279–281)**:

279. 1) $\sin\frac{\pi}{2} + \sin\frac{3\pi}{2}$; 2) $\sin\left(-\frac{\pi}{2}\right) + \cos\frac{\pi}{2}$; 3) $\sin\pi - \cos\pi$;

4) $\sin 0 - \cos 2\pi$; 5) $\sin\pi + \sin 1{,}5\pi$; 6) $\cos 0 - \cos\frac{3}{2}\pi$.

280. 1) $\operatorname{tg}\pi + \cos\pi$; 2) $\operatorname{tg} 0^\circ - \operatorname{tg} 180^\circ$;

3) $\operatorname{tg}\pi + \sin\pi$; 4) $\cos\pi - \operatorname{tg} 2\pi$.

281. 1) $3\sin\frac{\pi}{6} + 2\cos\frac{\pi}{6} - \operatorname{tg}\frac{\pi}{3}$; 2) $5\sin\frac{\pi}{6} + 3\operatorname{tg}\frac{\pi}{4} - \cos\frac{\pi}{4} - 10\operatorname{tg}\frac{\pi}{4}$;

3) $\left(2\operatorname{tg}\frac{\pi}{6} - \operatorname{tg}\frac{\pi}{3}\right) : \cos\frac{\pi}{6}$; 4) $\sin\frac{\pi}{3}\cos\frac{\pi}{6} - \operatorname{tg}\frac{\pi}{4}$.

282. Tenglamani yeching:

1) $2\sin x = 0$; 2) $\frac{1}{2}\cos x = 0$; 3) $\cos x - 1 = 0$; 4) $1 - \sin x = 0$.

283. (Og‘zaki.) $\sin\alpha$ yoki $\cos\alpha$:

1) 0,49; 2) –0,875; 3) $-\sqrt{2}$; 4) $2-\sqrt{2}$

ga teng bo‘lishi mumkinmi?

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284. α ning berilgan qiymatida ifodaning qiymatini toping:

1) $2\sin\alpha + \sqrt{2}\cos\alpha$, bunda $\alpha = \frac{\pi}{4}$;

2) $0{,}5\cos\alpha - \sqrt{3}\sin\alpha$, bunda $\alpha = 60^\circ$;

3) $\sin 3\alpha - \cos 2\alpha$, bunda $\alpha = \frac{\pi}{6}$;

4) $\cos\frac{\alpha}{2} + \sin\frac{\alpha}{3}$, bunda $\alpha = \frac{\pi}{2}$.

285. Tenglamani yeching:

1) $\sin x = -1$; 2) $\cos x = -1$; 3) $\sin 3x = 0$;

4) $\cos 0{,}5x = 0$; 5) $\cos 2x - 1 = 0$; 6) $1 - \cos 3x = 0$.

288. Agar:

1) $\alpha = \frac{5\pi}{4}$; 2) $\alpha = \frac{5\pi}{6}$; 3) $\alpha = -\frac{5}{8}\pi$;

4) $\alpha = -\frac{4}{3}\pi$; 5) $\alpha = 740^\circ$; 6) $\alpha = 510^\circ$

bo‘lsa, $\sin\alpha$ sonning ishorasini aniqlang.

289. Agar:

1) $\alpha = \frac{2}{3}\pi$; 2) $\alpha = \frac{7}{6}\pi$; 3) $\alpha = -\frac{3\pi}{4}$;

4) $\alpha = -\frac{2}{5}\pi$; 5) $\alpha = 290^\circ$; 6) $\alpha = -150^\circ$

bo‘lsa, $\cos\alpha$ sonning ishorasini aniqlang.

290. Agar:

1) $\alpha = \frac{5}{6}\pi$; 2) $\alpha = \frac{12}{5}\pi$; 3) $\alpha = -\frac{3}{5}\pi$; 4) $\alpha = -\frac{5}{4}\pi$;

5) $\alpha = 190^\circ$; 6) $\alpha = 283^\circ$; 7) $\alpha = 172^\circ$; 8) $\alpha = 200^\circ$

bo‘lsa, $\operatorname{tg}\alpha$ va $\operatorname{ctg}\alpha$ sonlarning ishoralarini aniqlang.

291. Agar:

1) $\pi < \alpha < \frac{3\pi}{2}$; 2) $\frac{3\pi}{2} < \alpha < \frac{7\pi}{4}$;

3) $\frac{7}{4}\pi < \alpha < 2\pi$; 4) $2\pi < \alpha < 2{,}5\pi$

bo‘lsa, $\sin\alpha$, $\cos\alpha$, $\operatorname{tg}\alpha$, $\operatorname{ctg}\alpha$ sonlarning ishoralarini aniqlang.

292. Agar:

1) $\alpha = 1$; 2) $\alpha = 3$; 3) $\alpha = -3{,}4$; 4) $\alpha = -1{,}3$

bo‘lsa, $\sin\alpha$, $\cos\alpha$, $\operatorname{tg}\alpha$ sonlarning ishoralarini aniqlang.

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293. $0 < \alpha < \frac{\pi}{2}$ bo‘lsin. Sonning ishorasini aniqlang:

1) $\sin\left(\frac{\pi}{2} - \alpha\right)$; 2) $\cos\left(\frac{\pi}{2} + \alpha\right)$; 3) $\operatorname{tg}\left(\frac{3}{2}\pi - \alpha\right)$; 4) $\sin(\pi - \alpha)$;

5) $\cos(\alpha - \pi)$; 6) $\operatorname{tg}(\alpha - \pi)$; 7) $\cos\left(\alpha - \frac{\pi}{2}\right)$; 8) $\operatorname{ctg}\left(\alpha - \frac{\pi}{2}\right)$.

294. Sinus va kosinuslarning ishoralari bir xil (har xil) bo‘ladigan α sonning 0 dan 2π gacha oraliqda joylashgan barcha qiymatlarini toping.

295. Sonning ishorasini aniqlang:

1) $\sin\frac{2\pi}{3}\sin\frac{3\pi}{4}$; 2) $\cos\frac{2\pi}{3}\cos\frac{\pi}{6}$; 3) $\dfrac{\sin\frac{2\pi}{3}}{\cos\frac{3\pi}{4}}$; 4) $\operatorname{tg}\frac{5\pi}{4} + \sin\frac{\pi}{4}$.