Matematika 3 -- 7. siječnja 2026. 14:45-15:30

Podsjetnik: Mat 3 -- realne funkcije realne varijable, uglavnom elementarne funkcije
-- sustavi linearnih jednadžbi (Gaussova metoda, matrice i determinante)
-- primjene na vektore i geometriju (to se proširuje u Mat4)

Elementarne funkcije: spisak osnovnih geometrijskih funkcija (polinomijalne, racionalne funkcije, opća potencija, eksponencijalne funkcije, logaritamska funkcija, trigonometrijske funkcije, inverzne trigonometrijske funkcije) i onda od njih radimo kombinacije +,-,*,/ i kompozicija funkcija

Primjer cos(log_10(x^3/(x+1))) je elementarne funkcija

log nat
ln = log_e
e = 2.7182818...
baza pozitivna

Odredi domenu te funkcije (kao fje realne varijable)

treba dijeliti s x+1 -- možemo ako x nije -1

dalje treba izračunati logaritam

10^x je uvijek pozitivno čak i ako je x<0

znači logaritam postoji samo za pozitivne brojeve (Dom log = R_+)

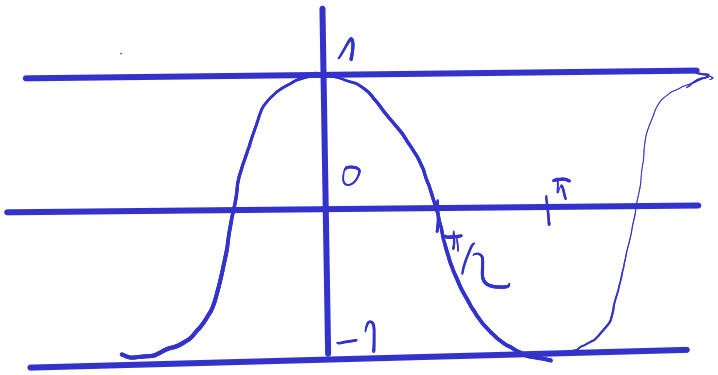
$\frac{x^3}{x+1} > 0$

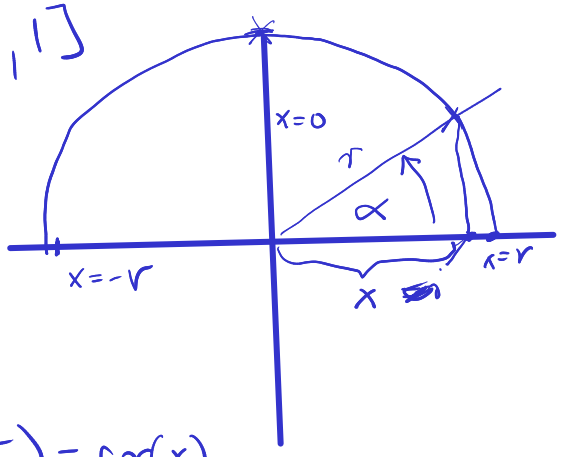
I $x^3 > 0$, $x+1>0$ $\Rightarrow$ $x>0$, $x>-1$ $\Rightarrow$ $x>0$

II $x^3<0$, $x+1<0$ $\Rightarrow$ $x<0$, $x<-1$ $\Rightarrow$ $x<-1$

$\cos(y)$ je def. $\forall y \in \mathbb{R}$

$\cos : \mathbb{R} \to [-1,1]$





$T = 2\pi$

$\cos(x+T) = \cos(x)$

$\mathrm{Dom} f = (-\infty,-1) \cup (0,+\infty)$

$\cos\left(\log\left(\frac{x^3}{x+1}\right)\right)$

Arctg
arctg

$\operatorname{tg} x = \frac{\sin x}{\cos x}$

$\cos x = 0$ za $x = \frac{2k+1}{2}\pi$, $k \in \mathbb{Z}$

$\frac{y}{x} = \frac{y}{x}$

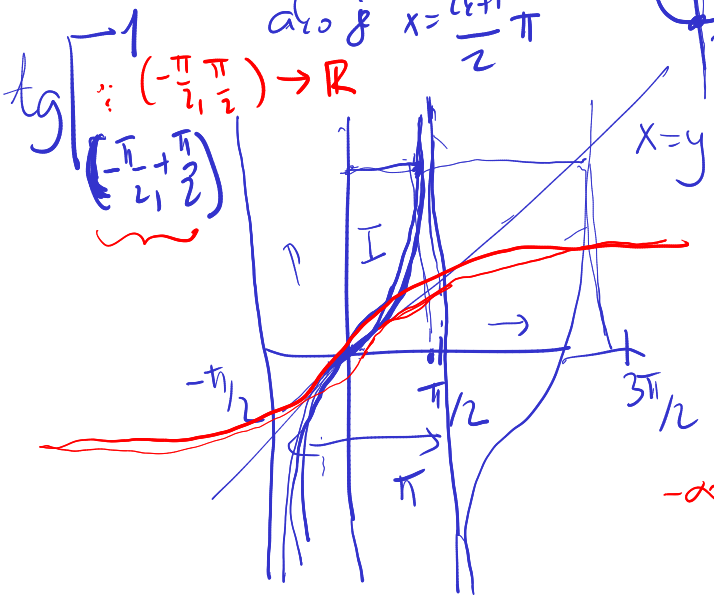
$\operatorname{tg}(-\alpha) = -\operatorname{tg}\alpha$

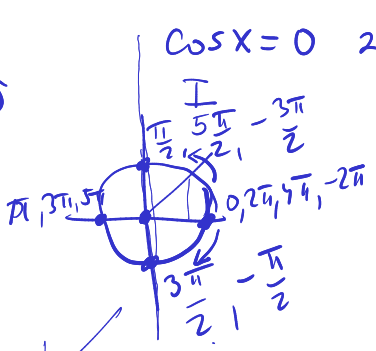
nije def.

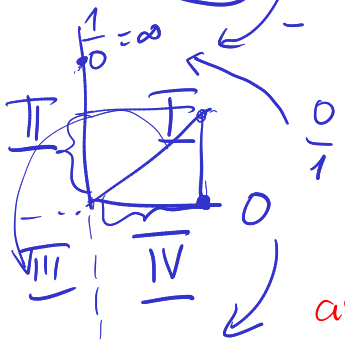
arg. je $x = \frac{2k+1}{2}\pi$

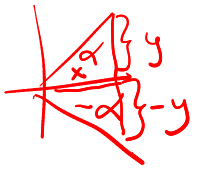
$\operatorname{tg}: (-\frac{\pi}{2}, \frac{\pi}{2}) \to \mathbb{R}$

$(-\frac{\pi}{2} + k\pi, \frac{\pi}{2} + k\pi)$

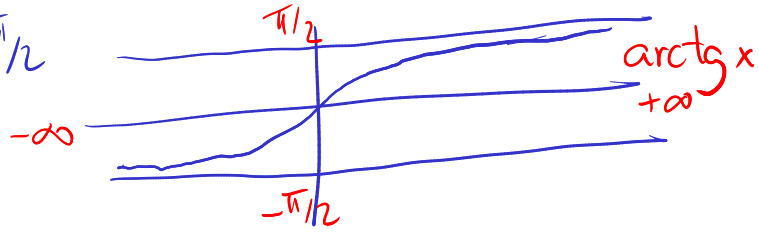


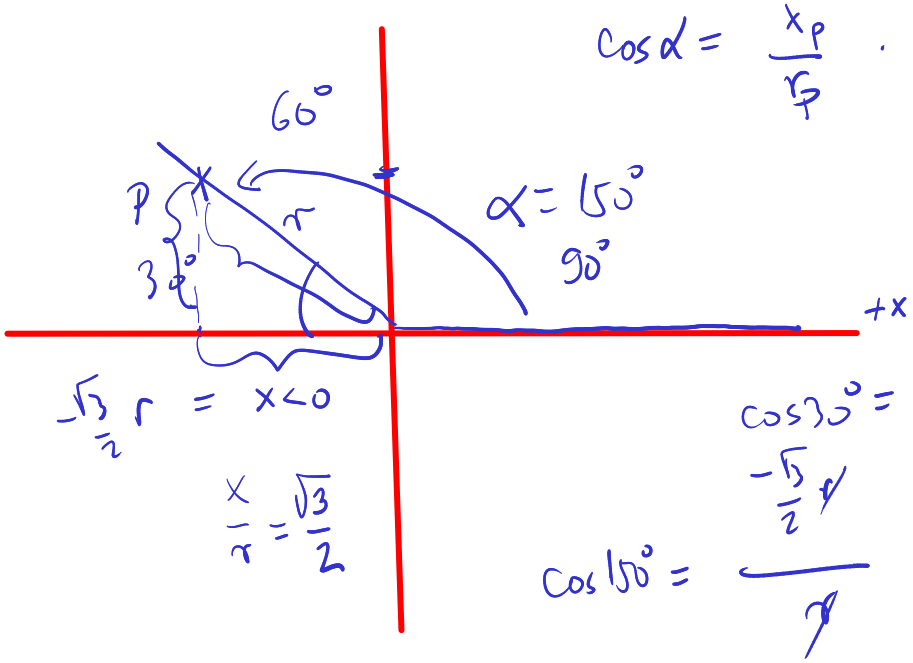






$\operatorname{arctg}: \mathbb{R} \to \langle -\frac{\pi}{2}, \frac{\pi}{2} \rangle$





$\cos\alpha = \frac{x_P}{r_P}$. $\cos 150° = -\frac{\sqrt{3}}{2}$

$-\frac{\sqrt{3}}{2} r = x < 0$

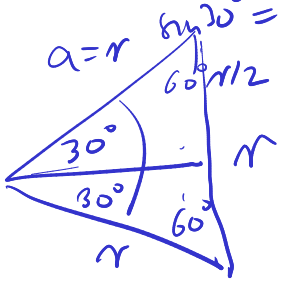
$\frac{x}{r} = \frac{\sqrt{3}}{2}$

$\cos 30° = \frac{v}{r} = \frac{\sqrt{3}}{2}$

$\cos 150° = \frac{-\frac{\sqrt{3}}{2} r}{r}$

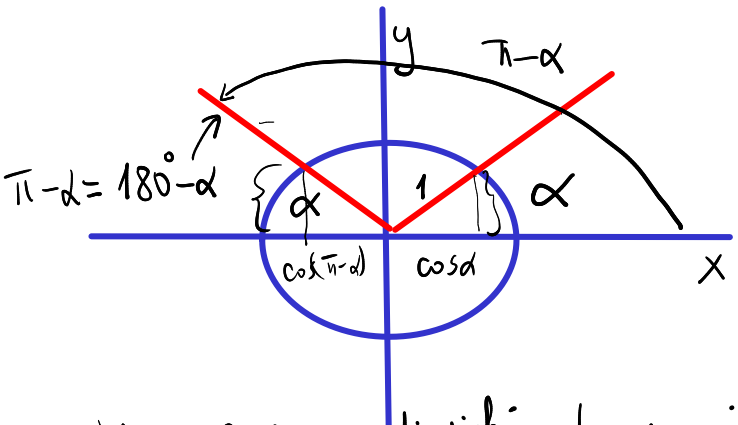
$\sin 30° = \frac{r/2}{r}$

$\sin 30° = 1/2$



$v = \sqrt{r^2 - (r/2)^2}$

$= \sqrt{\frac{3}{4} r^2} = \frac{\sqrt{3}}{2} r$



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

$\sin(\pi-\alpha) = \sin\alpha$

MAT2: adicijski teoremi za sin, cos, tg, ctg

$\cos(\pi-\alpha)$ ↑ $\pi \pm \alpha$

$\alpha + (-\beta)$

$$\cos(\alpha \pm \beta) = \cos\alpha\cos\beta \mp \sin\alpha\sin\beta$$

$$\sin(\alpha \pm \beta) = \sin\alpha\cos\beta \pm \cos\alpha\sin\beta$$

$tg(-\alpha) = -tg\alpha$ — parna

$\cos(-\beta) = \cos\beta$ — parna

$\sin(-\beta) = -\sin\beta$ — neparna